



**ELEMENT  
SUSTAINABILITY**

# **CIRCLE SQUARE No.3, MANCHESTER**

## **ENVIRONMENTAL STANDARDS STATEMENT**

**JUNE 2022**

**REF: 2021.305**



## ELEMENT SUSTAINABILITY – ISSUE NOTES

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Environmental Standards Statement

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Appendix A - BREEAM Tracker

Appendix B – Energy Strategy and Performance Appraisal



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## 1. INTRODUCTION

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Element Sustainability has been commissioned by Bruntwood Scitech to review the sustainability performance of the proposed scheme at Circle Square Plot 3, Manchester.

The purpose of this statement is to summarise the relevant policy background and requirements of Manchester City Council (hereafter referred to as the council) and demonstrate the ways in which the developer, Bruntwood Scitech, has addressed these aims through their proposals, ensuring all practicable measures have been taken in order to deliver a sustainable development at this site.

Details of the design attributes, specifications and characteristics of the scheme are appraised in order to demonstrate how the proposals contribute to sustainable development in Manchester and seek to mitigate the environmental impacts of the scheme, providing a sustainability appraisal in support of the planning application.



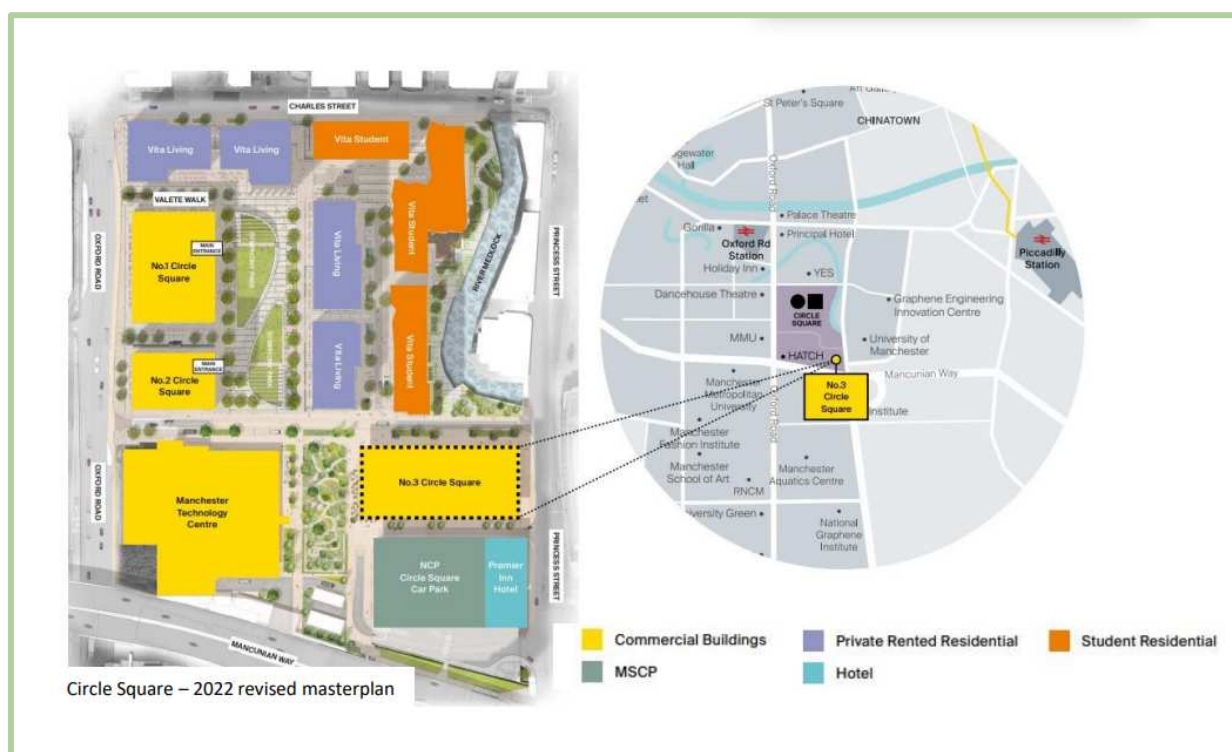
## 2. DEVELOPMENT PROPOSALS

### 2.1 Development Site Description

The site is located in the landmark mixed-use Circle Square development, within The Oxford Road Corridor Innovation District. The entire masterplan is bound by Charles Street to the North, Princess Street to the East, Mancunian Way to the south and Oxford Road to the west, with the River Medlock occupying the north eastern corner of the site.

On the original Circle Square Masterplan, the site is identified as Plot 12/13 and is positioned along the eastern border. To the west of No. 3 Circle Square is the Manchester Technology Centre which is currently used as a commercial office building with retail units located on the ground floor. In between these two blocks will be the new Symphony Garden, a significant new landscaped space, that extends the existing Symphony Gardens. North of the site sits the Vita Student blocks and the River Medlock. Beyond Princess Street, to the east of the site, lies the University of Manchester North Campus comprising a number of buildings used for education and research purposes. A multi-storey car park and Premier Inn Hotel occupy the southern boundary.

Figure 2.1- Circle Square Masterplan



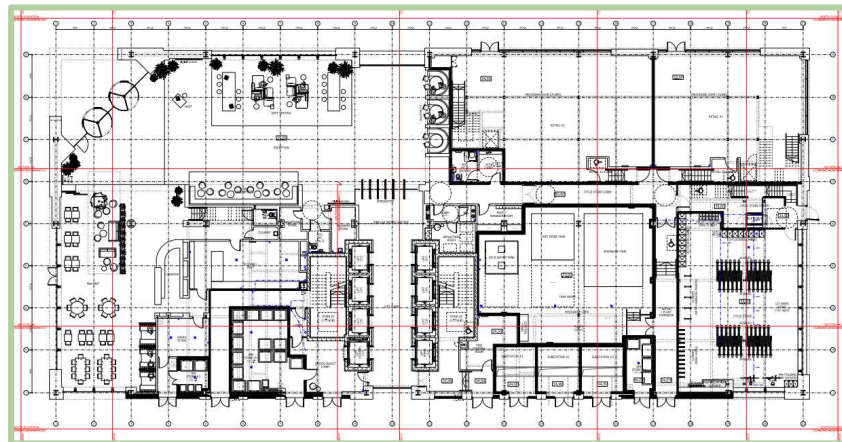
### 2.2 Development Proposals

The proposed development comprises the construction of a new 15 floor use class E office building with ground floor retail space, that aims to be Net Zero Carbon in both embodied carbon and operation. The building will provide a mix of facilities at ground floor and ground floor mezzanine levels, including; a reception with informal meeting spaces and host station, cyclist facilities, ancillary accommodation, plant spaces, 3 sub-stations and a café/restaurant with kitchen area. The first to thirteenth floors will be occupied by conventional office space, whilst the 14<sup>th</sup> floor will include a range of amenity spaces, lounge areas, informal meeting spaces, an events area and 2 outdoor terraces. In addition to this, a new section of public



realm will be created, to complement the site-wide landscaping strategy and provide external spill out space for the ground floor amenities.

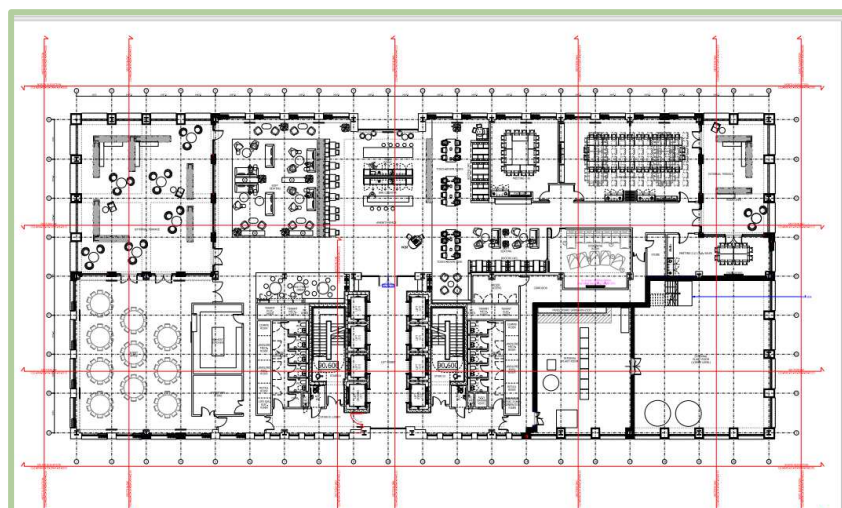
*Figure 2.2 – Proposed Ground Floor Layout*

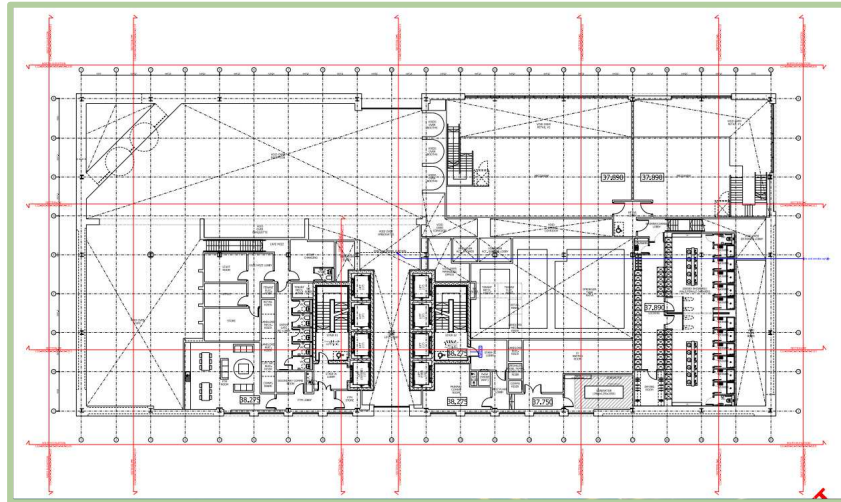
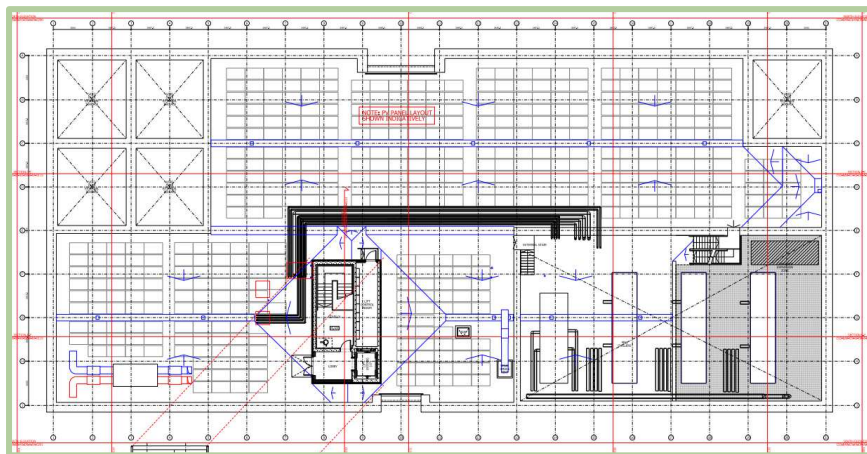
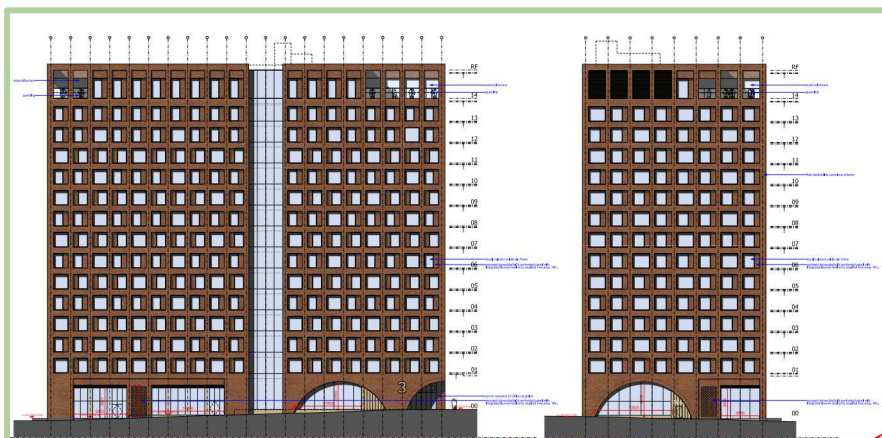


*Figure 2.3 – Proposed Typical Upper Floor Layout*



*Figure 2.4 – Proposed Fourteenth Floor Layout*



*Figure 2.5 – Proposed Mezzanine Layouts**Figure 2.6 - Proposed Roof Layout**Figure 2.6 Proposed North and East Elevation Plan*

*Figure 2.7 Indicative elevations to demonstrate heights at 14 storeys*



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## 3. POLICY REVIEW

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### 3.1 National Planning Policy

The National Planning Policy Framework (NPPF) 2021 states that the planning system should play an active role in guiding development to sustainable solutions. At the heart of the 2021 updated NPPF lies the ‘presumption’ in favour of sustainable development; the golden thread running through plan-making and decision taking. There are three dimensions to sustainable development, as stated within the NPPF: economic, social, and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:

**An economic role** – contributing to building a strong, responsive, and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;

**A social role** – supporting strong, vibrant, and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating beautiful and safe places, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being; and

**An environmental role** – contributing to protecting and enhancing our natural, built, and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

These dimensions are considered to be mutually dependent with the NPPF, in its entirety, defining sustainable development. The NPPF states that ‘the purpose of the planning system is to contribute to the achievement of sustainable development’ (paragraph 7). It summarises the objective of sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their needs. It goes on to state that at a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being, and environmental protection.

### 3.2 Local Planning Policy

#### 3.2.1 Manchester Core Strategy

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

**CS Policy DM 1 - Development Management** requires all development to have regard to a number of development principles. Subject to scheme viability, developers may be required to demonstrate that new non-domestic development to achieve a BREEAM Rating of ‘Very Good’ or for domestic development to achieve the Code for Sustainable Homes standard<sup>1</sup>.

**CS Policy EN 4 - Reducing CO<sub>2</sub> Emissions** by Enabling Low and Zero Carbon Development requires all development to follow the principle of the Energy Hierarchy, being designed:



- To reduce the need for energy through design features that provide passive heating, natural lighting and cooling;
- To reduce the need for energy through energy efficient features such as improved insulation and glazing; and
- To meet residual energy requirements using low or zero carbon energy generating technologies.

**CS Policy EN 5 - Strategic Areas for low and zero carbon decentralised energy infrastructure** include:

- The Regional Centre, which also includes the Oxford Road Corridor and Eastlands;
- District Centres and associated major development sites;
- Airport Strategic Site;
- Strategic housing location; and,
- Strategic employment locations.

Within these areas, new development, regeneration and retrofit projects will be expected to take place in the context of more detailed proposals for decentralised low and zero carbon energy infrastructure in the form of energy proposals plans.

**CS Policy EN 6 - Target Framework for CO<sub>2</sub> Reductions from Low or Zero Carbon Energy Supplies** requires applications for residential development of 10 or more units and all other development over 1,000m<sup>2</sup> to meet, as a minimum, the targets shown in the tables below, unless unviable.

*Table 3.1 – Policy EN6 CO<sub>2</sub> Emissions Reduction Targets; Non-Domestic*

| Target                                                                                                                                                                             | % Minimum Requirements                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Target One: Network development area</b>                                                                                                                                        | CHP/District heating anchor or connection or where not feasible a 15% increase on Part L 2010 |
| <b>Target Two: Electricity intense buildings</b><br>(Applies to commercial uses with a high proportion of emission from electricity use (>45 kg CO <sub>2</sub> /m <sup>2</sup> )) | +10% increase on Part L 2010                                                                  |
| <b>Target Three: Micro generation area</b>                                                                                                                                         | +15% increase on Part L 2010                                                                  |

The Proposed Development falls under the Target 2 criteria and must comply with Part L (2013). The emission reductions targeted within policy EN6 relate to Building Regulation Part L 2010. As a consequence of the reduction in emission rates required by current building regulations (Part L, 2013) relative to Part L 2010, the revised equivalent target CO<sub>2</sub> emission reductions for the residential scheme are presented below:

- Non-domestic – 6% building emission rate reduction over Part L 2013.

Please note that the Proposed Development was registered with Building Control prior to 15<sup>th</sup> June 2022 and therefore will be compliance checked against the Part L2A (2013) Building Regulations.

**CS Policy EN 8 – Adaption to Climate Change** requires all new development to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:



- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rainwater permeability;
- Reduction in urban heat island effect using Green Infrastructure such as green roofs, green walls, increased tree cover and waterways;
- The need to control overheating of buildings through passive design; and
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

**CS Policy T 1 – Sustainable Transport** aims to deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:

- Improve choice by developing alternatives to the car;
- Promote regeneration and economic vitality by relieving traffic congestion and improving access to jobs and services, particularly for those most in need and for those without a car;
- Improve access to transport services and facilities to enable disabled people and people with mobility impairments to participate fully in public life;
- Improve pedestrian routes and the pedestrian environment;
- Improve and develop further Manchester's cycle network (for example the Manchester Cycleway and the Trans Pennine Trail); and
- Facilitate modes of transport that reduce carbon emissions e.g., by incorporating charging points for electric vehicles, subject to their appropriate design and location.

### 3.2.2 Guide to Development in Manchester, Supplementary Planning Document

Manchester's Core Strategy requires that all new residential developments should accord with the design guidance set out in the Supplementary Planning Documents (SPD). The Guide to Development in Manchester SPD was adopted on 11<sup>th</sup> April 2007 and supports and enhances the ongoing shaping of the City by providing a set of reasoned principles which will guide developers, designers and residents. These principles include a number of environmental standards, and includes the following categories which are identified in the SPD:

- |                                     |                                |
|-------------------------------------|--------------------------------|
| • Energy Efficiency;                | • Renewable Energy;            |
| • Environmental Design; resilience; | • Water management and weather |
| • Waste management;                 | • Construction management;     |
| • Biodiversity;                     | • Waterways.                   |



### 3.2.3 Manchester's Great Outdoors

A **Green and Blue Infrastructure Strategy for Manchester** aims to invest in the city's green and blue infrastructure over the next 10 years (by 2025). Four objectives have been established to enable the vision to be achieved:

1. Improve the quality and function of existing green and blue Infrastructure, to maximise the benefits it delivers.
2. Use appropriate green and blue infrastructure as a key component of new developments to help create successful neighbourhoods and support the city's growth.
3. Improve connectivity and accessibility to green and blue infrastructure within the city and beyond.
4. Improve and promote a wider understanding and awareness of the benefits that green and blue infrastructure provides to residents, the economy and the local environment.

### 3.2.4 Climate Emergency

On 10<sup>th</sup> July 2019, a motion asking MCC to formally declare a **climate emergency** was unanimously agreed. The motion declares that climate change is a serious risk to Manchester's future, and demonstrates MCC's commitment to embedding the issue as an integral part of councils decision-making process, making sure all key decisions are taken with the city's target of becoming zero-carbon by 2038 in mind.

The actions are structured into five key sections as follows:

- Buildings and energy;
- Transport and travel;
- Reducing consumption based emissions and influencing suppliers;
- Climate adaptation, carbon storage and carbon sequestration;
- Influencing behaviour and being a catalyst for change.

In March 2020 the Executive adopted the Manchester Climate Change Framework 2020-2025. The five-year framework sets out measures that MCC will take to reduce carbon emissions from its buildings, energy use and transport by 50% between 2020 and 2025, based on a 13% year on year reduction trajectory. The Plan also includes retrofitting buildings to improve energy efficiency, increasing the use of Electric Vehicles, and seeking 100% renewable energy. Whilst this has also not been formally adopted into planning policy, it is a key consideration for future development proposals.

The Council have also supported the establishment of the Oxford Road Corridor Zero Carbon Sub-Group to accelerate action in this strategically important area of the city. Zero carbon ambitions are now being included in all Strategic Regeneration Framework (SRF) documents.

### 3.2.5 Oxford Road Corridor Strategic Spatial Framework

The Strategic Spatial Framework (SSF) has been prepared on behalf of the Oxford Road Corridor Partnership to accompany the Corridor Strategic Vision to 2025 and identify the spatial principles that should support the strategic themes and objectives set out in that document.



The SSF identifies a number of key sustainability drivers which will promote sustainable development within the Oxford Road Corridor, and help Manchester achieve its target of becoming zero carbon by 2038. These include:

- New development to positively respond to existing strategic and planning policies relating to sustainability, energy and climate change.
- Reduce the need for energy through design features, efficiency features, and the use of low and zero carbon energy.
- Consideration of design, siting and layout of new development in terms of ensuring it is adaptable to climate change (including factors such as flood risk, urban heat island effect, overheating and species adaptation).

### 3.3 Emerging Policies

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 GMCA on behalf of the 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 take a positive approach to renewable and low carbon developments and includes an expectation that new development will be net zero carbon from 2038.

The consultation for the PfE concluded in October 2021 and that it is now expected to progress to examination. It is therefore considered that the Plan is in an advanced stage of preparation.

### 3.4 Regulatory Framework

**Building Regulations, Part L - Conservation of Fuel and Power** sets the compliance standards for energy demand and carbon dioxide emissions from buildings. Guidance on how to meet the requirements of this regulation is provided within a number of approved documents. The relevant document is referenced below:

**Approved Document L2A** addresses the conservation of fuel and power in new non-domestic buildings. The proposed development will be registered against Building Regulations, Part L (2013) which requires all newly constructed buildings to comply with the 5 criteria set out in Approved Document L2A:

- I. Achievement of an acceptable Building CO<sub>2</sub> Emission Rate. i.e., the BER is less than the TER (target emission rate for a notional building);
- II. Limits on design flexibility – including U-values, air permeability, air handling plant efficiency, duct leakage, insulation, lighting system efficiency;
- III. Limiting solar gains in summer;
- IV. Construction quality and commissioning - The BER must be recalculated as constructed; and
- V. Provision of information - Information must be provided to the building operator.



### 3.5 Applicable Targets

Based upon a review of relevant planning policy requirements, legislative drivers, and client priorities, the following list provides a brief precis of the key criteria that should be targeted for this development:

- **CS Policy DM 1 - Development Management;**
- **CS Policy EN 4 – Reducing CO<sub>2</sub> Emissions;**
  - Following the principles of the Energy Hierarchy to reducing CO<sub>2</sub> Emissions;
- **CS Policy EN 5 - Strategic Areas for low and zero carbon decentralised energy infrastructure;**
- **CS Policy EN 6 – Target Framework For CO<sub>2</sub> Reductions From Low or Zero Carbon Energy Supplies;**
  - Non-Domestic – 6% building emission rate reduction over Part L2A 2(013)
- **CS Policy EN 8 – Adaption to Climate Change;**
- **CS Policy T 1 – Sustainable Transport;**
- **Oxford Road Corridor Strategic Spatial Framework**
- **The Guide to Development in Manchester SPD;**
- **A Green and Blue Infrastructure Strategy for Manchester;**
- **Approved Document L2A (2013)** will guide the compliance standards for energy demand and carbon dioxide emissions from buildings to ensure compliance with CS Policy EN 6.

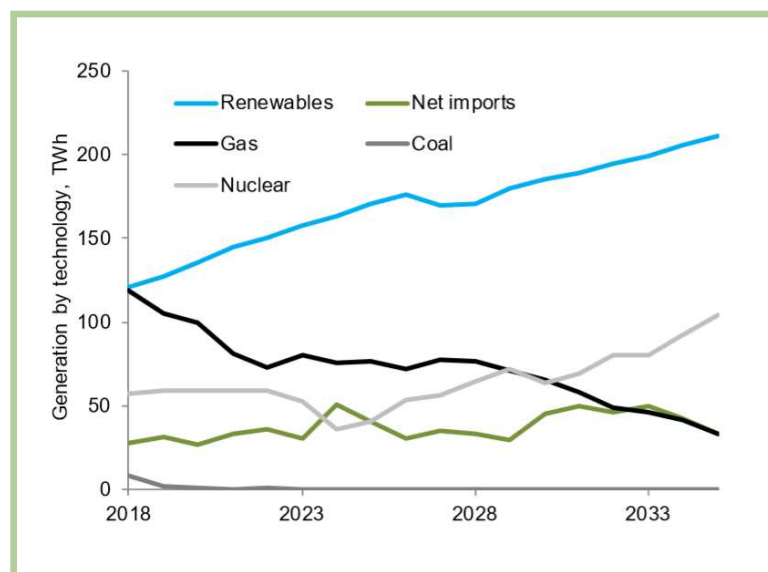


## 4. CLIMATE CHANGE EMERGENCY

A Climate Emergency was declared by Manchester City Council on 10<sup>th</sup> July 2019, with a target to make Manchester carbon neutral by 2038. In support of this, the developer wishes to highlight the following measures that will form part of the specification of this development:

- An energy strategy that delivers the current Core Strategy carbon dioxide emission reduction and renewable energy generation targets;
  - In securing compliance with the current, stringent building regulation Part L targets, a commitment is made to construct a high quality, energy efficient thermal envelope thereby minimising demand side energy loads – in accordance with the principles of the energy hierarchy;
  - A commitment is made to achieving at least 6% building emission rate reduction relative to the current Part L1A (2013) compliance standard;
  - The electric space heating strategy will improve upon Manchester’s emerging emissions targets;
  - The low carbon share of electricity generation is projected to rise from 22% in 2010 to 65% in 2020. As the UK electricity grid CO<sub>2</sub> footprint continues to reduce (see Figure 6.1 sourced from BEIS Energy and Emissions Projections 2018), so too will the carbon emissions associated with this scheme.

Figure 4.1 - Energy and Emissions Projections 2018 (BEIS)



- Furthermore, ‘electric’ strategies supply electric on demand, are 100% efficient and only use what is required. Therefore, this reduces the overheating of the buildings; and,
- Electric Panel Heaters will be utilised in the amenity and common areas, delivering high efficiency heating;
- There is a fine balance between the solar gain, overheating calculations, which require an element of heat loss, and energy models that require heat insulation. In essence, there is a limit to fabric enhancements such as increased insulation and improved air tightness as this yields a higher overheating risk and as a consequence, the building will require increased cooling loads.



These components of the building design are not symbiotic, however the design of this development balances both requirements and incorporates a building specification intended to minimise cooling requirement. To demonstrate that the building in its current state will offer a high level of human comfort, whilst minimising the risk of overheating, an appraisal of natural daylighting, overheating and PMV (percentage Mean Vote) and PPD (Percentage People Dissatisfied) was undertaken, identifying that all areas of the development achieve suitable levels of thermal comfort during occupied hours.

- The development will further demonstrate resilience to potential climate change effects through the management of surface water:
  - The drainage strategy will incorporate the use of Sustainable Drainage Systems (SuDS) where appropriate; and,
  - This system will be designed to withstand a 1 in a 50-year storm event plus a 40% allowance for climate change.
- The design of the proposed site landscaping been considered in relation to mitigating impacts on climate change and improving biodiversity.
  - Carbon sequestration (CO<sub>2</sub> offsetting) from the planting of new trees; and,
  - The planting and provision of the proposed site landscaping space will support the Sustainable Drainage Systems (SuDS), by means of interception and transpiration.
- Waste is a misuse of natural resources and also contributes a large proportion of the UK's carbon footprint;
  - Waste minimisation during construction will reduce raw materials demand, thereby reducing the building's embodied carbon footprint; and,
  - During occupation, the building will benefit from recycling facilities to enable the local authority waste reduction targets, diverting more materials away from landfill and reducing the occupants' carbon footprint further
- The site's location will enable a low carbon, sustainable lifestyles. Located minutes away from several major railway stations, the occupants will have the option to utilise various sustainable modes of transport. This is facilitated by:
  - Basic infrastructure provided for future connections such as secure cycle storage on site;
  - Travel options, including local access to transport nodes for bus and train;
  - Local amenities are within easy walking distance of the site
- The building is designed to incorporate features that will serve to reduce energy demand, and in turn, carbon emissions arising from access to the dwellings:
  - The lighting provision will, where appropriate, incorporate energy management facilities such as daylight and occupancy detection, with absence detection control being used wherever practical.
  - The fit-out specification of the buildings will seek to minimise water demand. Water efficiency measures (such as dual flush toilets, flow restrictors and water efficient showers) will limit potable water demand which in turn will reduce water heating energy loads and also cut the process energy required to supply clean drinking water.



These commitments, in combination, seek to work towards the carbon reduction target of no more than 1.5°C global temperature increase and assist Manchester City Council in meeting their Climate Change Emergency objectives.



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## 5. SUSTAINABILITY STATEMENT

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This section provides an appraisal of the development proposals and details the specific approach, design features and specifications which will contribute to reducing the environmental impact of the proposed development. This section outlines those commitments that have been made by Bruntwood Scitech to ensure this proposed development contributes to sustainable development, meets the council's current policies and examines the following categories identified in the Guide to Development in Manchester, Supplementary Planning Document (SPD):

- Energy efficiency;
- Renewable energy;
- Environmental design;
- Water management and weather resilience;
- Waste management;
- Construction management;
- Biodiversity; and,
- Waterways.

The key specifications, site characteristics and design measures of the proposed development are considered below. They will mitigate the environmental impact of the scheme throughout both the construction stage and the future occupation of the development.

### 5.1 Energy Performance

In order to limit energy demand and carbon dioxide (CO<sub>2</sub>) emissions from the operation of the buildings, a number of design features will be integrated that will collectively contribute towards the emissions reduction target for the scheme.

Detailed measures are presented in Chapter 5 of this report, but in essence, the energy strategy focuses on a holistic and multi-faceted approach of improving the buildings' performance by applying a fabric-led approach and through improvements in the efficiency of the mechanical and electrical systems.

The reduction in energy demand to meet the carbon reduction targets will be achieved through the following design measures and low carbon technology options:

- High performance thermal insulation
- Low air permeability
- Maximising solar control to mitigate overheating risks
- Air and Water Source Heat Pumps
- Heat recovery ventilation systems (MVHR)
- Solar Photovoltaic system

These measures will secure the following carbon reduction targets:

- ✓ Non-Domestic (Office) – 42.32% improvement over Part L2A Building Regulations.
- ✓ Non-Domestic (Café) – 35.94% improvement over Part L2A Building Regulations
- ✓ Non-Domestic (Retail 1) – 48.88% improvement over Part L2A Building Regulations
- ✓ Non-Domestic (Retail 2) – 51.12% improvement over Part L2A Building Regulations



These reductions are in line with the requirements of the Manchester Core Strategy Policy EN 6 - Target Framework for CO<sub>2</sub> Reductions from Low or Zero Carbon Energy Supplies.

## 5.2 Water Conservation

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;
- Specification of efficient water fixtures throughout the scheme (low flow taps and showers, dual flush WCs); and,
- In order to reduce water demand, the sanitary fixtures will be specified to achieve a calculated consumption in line with a 50% improvement over the BRE baseline.

## 5.3 Resource Management and Pollution

### 5.3.1 Efficient Use of Land

The proposals include for the redevelopment of a previously developed, brownfield site as promoted by national and local planning policy.

The re-use of the piece of land in a highly accessible, city-centre location will provide a development that inherently supports sustainable commercial space with access to local amenities and sustainable modes of transport.

### 5.3.2 Pollution Control

To reduce emissions of gases with high global warming potential (GWP) and nitrogen oxide (NO<sub>x</sub>) into the atmosphere, the new build development will be specified with:

- Insulating materials that have a GWP of less than 5 throughout the development to reduce the construction phase impact of this scheme upon climate change.

Additionally, the following measures will be implemented:

- Pollution Prevention Guidance will be adhered to in respects of air (dust) and water (ground and surface) pollution during the demolition and construction phase;
- External light fittings will be controlled through a time switch, or daylight sensor, to prevent operation during daylight hours to limit the impact of artificial lighting for the development's occupants and surrounding environment;
- The development site is within the locality of the River Medlock. Where necessary, temporary drainage and pollution prevention measures will be in place on site, this may include, for example, bunded areas and spill kits to prevent harmful chemicals / materials from draining to



natural watercourses; and silt traps to ensure that suspended solids are removed from the drainage water;

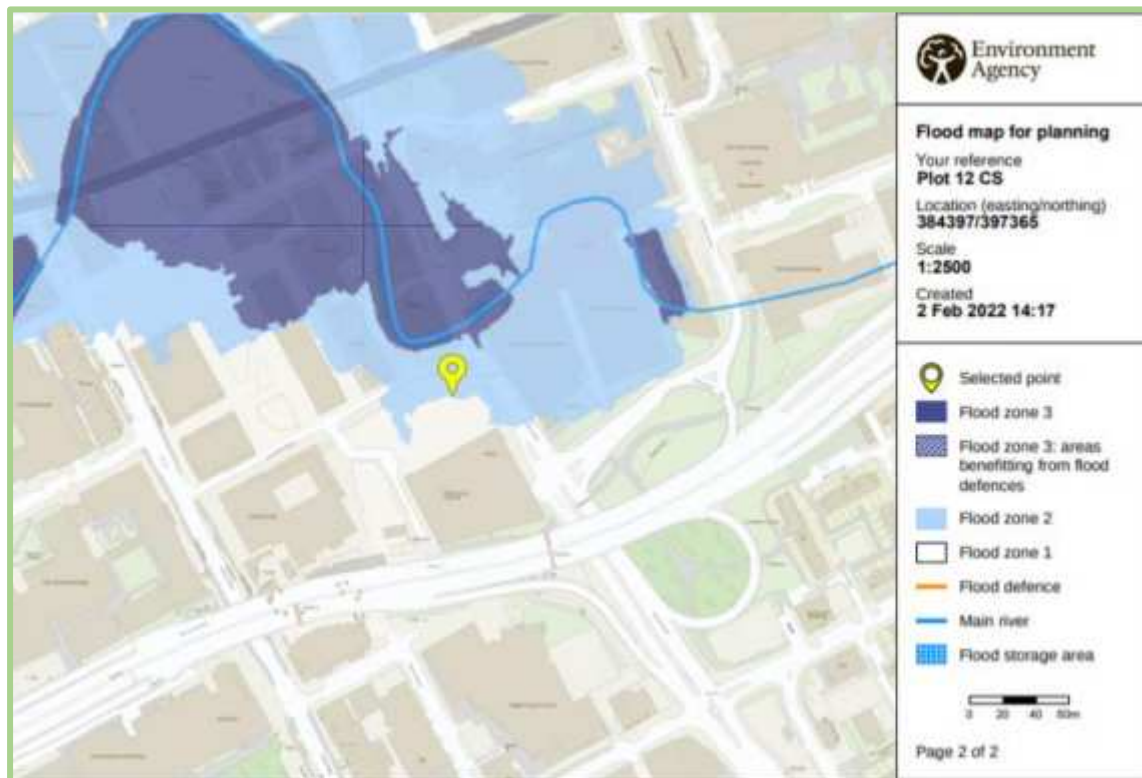
- Dust suppression measures will also be put in place as part of the Main Contractor's Environmental Management Plan, such that any potential risks to watercourses or the neighbouring properties are minimised.

## 5.4 Surface Water Run-Off

### 5.4.1 Flood Risk

Flood Maps demonstrate that the majority of the Site is located within Flood Zone 1, however part of the Site also falls within Flood Zone 2, as per the Environment Agency Flood Risk Map (Figure 4.1 below).

Figure 4.1 EA Flood Risk Map



### 5.4.2 On Site Surface Water Management

To minimise the risk and impact of localised flooding on and off-site, watercourse pollution and other environmental damage, a site-specific Flood Risk Assessment and Drainage Strategy Report has been prepared by Curtins Consulting Limited which confirms the following:

- The proposed development will be designed in order to reduce the post development surface water run-off to at least 50% of the existing surface-water brownfield runoff rates.
- To achieve the restriction in peak rates of surface water runoff from the developed site, the existing drainage is likely to require localised diversion works and relocation of the attenuation tank due to revised extents of the building footprint.



- The drainage strategy will incorporate the use of Sustainable Drainage Systems (SuDS) where appropriate throughout the site. The proposed surface water drainage strategy for the site currently includes below ground cellular attenuation tanks. This will reduce the volume of runoff discharging into the public sewer system.

## 5.5 Waste Management

### Construction Waste

Best practice techniques to prevent and minimise waste during the design and construction phases of the development will be adopted, as follows:

- Prior to commencement of the above ground construction phase, a site waste management plan (SWMP) will be produced by the developer to limit the on and off-site environmental impacts of construction. The SWMP will detail:
  - Recycled and secondary materials;
  - Waste reduction;
  - Waste segregation;
  - Waste recovery; and,
  - Waste disposal.
- The development has set targets to generate no more than 7.5 m<sup>3</sup> / 6.5 tonnes of construction waste per 100 m<sup>2</sup> Gross Internal Floor Area during construction.
- This scheme will promote the minimisation of waste arising in site development and seek to maximise the use of recycled materials in construction; and,
- A site waste management plan will identify opportunities to minimise waste generation and divert construction waste from landfill.

### Operational Waste

A Waste Management Strategy has been prepared by Curtins Consulting Limited in order to consider the potential refuse and recyclable waste volumes at No. 3 Circle Square, including organic waste and for all uses of this development.

The operational waste strategy for the scheme focuses on the segregation of waste at source, in order to maximise the potential for individuals to recycle. All individuals will be informed on collection frequency, as well as guidance on recycling and health and safety practices related to the management and storage of waste.

The proposed strategy has been developed in compliance with the policies of Manchester City Council, stating that new developments and conversions must include a Waste Management Strategy that includes:

- An estimated storage area for the waste produced by the development, including office and retail uses;
- Details of internal and external stores for both waste and recycling; and



- Location of the proposed collection point and details of the route the collection will take.

## 5.6 Materials

This development will contribute towards making more efficient use of non-renewable material resources and to reducing the lifecycle impact of materials used in construction. This is demonstrated by the selection of:

- Materials with low environmental impact throughout their lifecycle. A detailed Life Cycle Assessment Report has been produced, investigating the impact and embodied carbon emissions associated with construction materials throughout the life cycle of the building in order to consider less carbon intensive options (see Section 6.6 of this report).
- Responsibly sourced materials from suppliers operating an Environmental Management System, or procuring timber verified by either the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification standard (PEFC);
- Local sourcing of construction materials where feasible and viable, which will minimise the impact of carbon dioxide emissions associated with the transportation of materials;
- Robust materials such as block paving and stone will be utilised for hard landscaping, therefore minimising the frequency of replacement and maximising materials optimisation and extending replacement intervals;
- Material selection will be carefully considered to avoid the use of toxic materials, such as Volatile Organic Compounds (VOCs) and contribute towards creating a healthy indoor environment; and
- Excavated material (such as soil and substructural elements) from construction and demolition works will be used, where practical, for landscaping purposes and within the public realm.

## 5.7 Ecology and Biodiversity

An extended Phase One Habitat Survey has been undertaken by Penny Anderson Associates for the site to provide an indication of the species present in and around the site.

The majority of the site comprises hardstanding tarmac/concrete and recently cleared land, with two compartments of amenity grassland. A number of protected species were recorded in the surrounding area, including hedgehogs, badgers, bats, peregrine falcons and other nesting birds. However, there were no structures within the existing site footprint which had suitability to support roosting bats. Suitability for any nesting birds was also very limited, with areas of scrub and vegetation being poorly developed and unlikely to offer sufficient protection for general nesting birds. Likewise, suitable perching and nesting opportunities for peregrine falcons were not present within the site boundary.

It was concluded that the existing site held negligible potential to support other protected species.

Overall, the site is currently assessed as being of limited ecological value. However, there are opportunities to enhance the sites biodiversity. The following measures should therefore be considered:



- Integration of the landscaping scheme into the wider site soft landscaping to increase permeability of the site to wildlife;
- Use of native or wildlife-friendly tree, shrub and herbaceous species in any landscape planting, for example inclusion of species which provide nectar for invertebrates or berries to provide a food source for birds;
- Inclusion of bird boxes to accommodate typical urban bird species, away from street and security lighting; and
- Inclusion of bat roost features on built structure where the design allows, to increase opportunities for roosting bats, coupled with a suitable lighting strategy to avoid unnecessary lighting of any roost features.

## 5.8 Transport

To further enhance the sustainable credentials of the proposals, a Transport Assessment has been prepared by Curtins Consulting Limited. The Assessment concludes that future building occupants will have a variety of sustainable travel options that will reduce reliance on the car. Overall, the development is highly accessible by sustainable modes of transport, which are also usable by those with limited mobility and are wheelchair accessible.

The surrounding area exhibits good levels of pedestrian and cycling infrastructure, and there are a number of public transport opportunities within accessible walking distance of the site.

### *Transport Links -*

- The site benefits from excellent sustainable access opportunities and is well connected by existing walking and cycling routes to key trip attractors. Bus and train can also be used to easily access the site;
  - Bus – The nearest bus stops are located along Oxford Road and Princess Street; all approximately within 200m walk from the site. These bus stops provide regular services to a variety of destinations across Greater Manchester.
  - Rail – The nearest railway station is Oxford Road which is approximately 500m to the north of the development site. The station provides services to Manchester Airport, Liverpool, Wigan and other regional locations. Furthermore, Deansgate station is only a fifteen-minute walk from the site.
  - Metrolink – The nearest Metrolink station is Deansgate Castlefield which just a fifteen-minute walk from the site. This provides regular services to destinations including Bury, Oldham, Ashton-Under-Lyne, East Didsbury and Manchester Airport.
- The proposal acknowledges the sustainable location of the site within Manchester which would be car-free and comprise no car parking spaces.
- A minimum of one-hundred and eighteen cycle spaces will be provided in secure accessible locations, with cyclist facilities in the form of lockers, showers and changing rooms also provided.



*Local Amenity Access -*

- Building users are able to walk to local amenities and shops along Oxford Road; and,
- The site benefits from very good links to local amenity space and recreational facilities, such as:
  - Recreational Space – The River Medlock is within the locality of the development site, with Symphony Park and Symphony Gardens forming part of the wider Circle Square development.
  - Education – Manchester Metropolitan University and The University of Manchester are located within close proximity of the site.
  - Cultural – There are a multiplicity of cultural institutions such as the Science and Industry Museum, numerous theatre and art venues and Manchester’s City Library only a short bus ride into central Manchester.

## 5.9 Health and Wellbeing

To enable the occupants of the proposed development to lead lower impact lifestyles and enhance their quality of life, the following measures will be delivered:

- Good levels of natural day lighting will be achieved within the development. This will provide a good quality of life for the occupants and reduce the need for energy to light the building areas;
- The combined office, retail and café elements of the scheme will enhance the character of the area and provide areas where people will want to spend their free time, supporting a vibrant, diverse and inclusive development;
- The security needs of the development will be considered to achieve Secure by Design accreditation and adopt crime prevention measures to assist in reducing the opportunity for, and fear of crime; and
- The landscaped area will also facilitate natural surveillance and create busy, overlooked routes at the site to reduce the opportunity for crime, creating a safer and more secure environment.

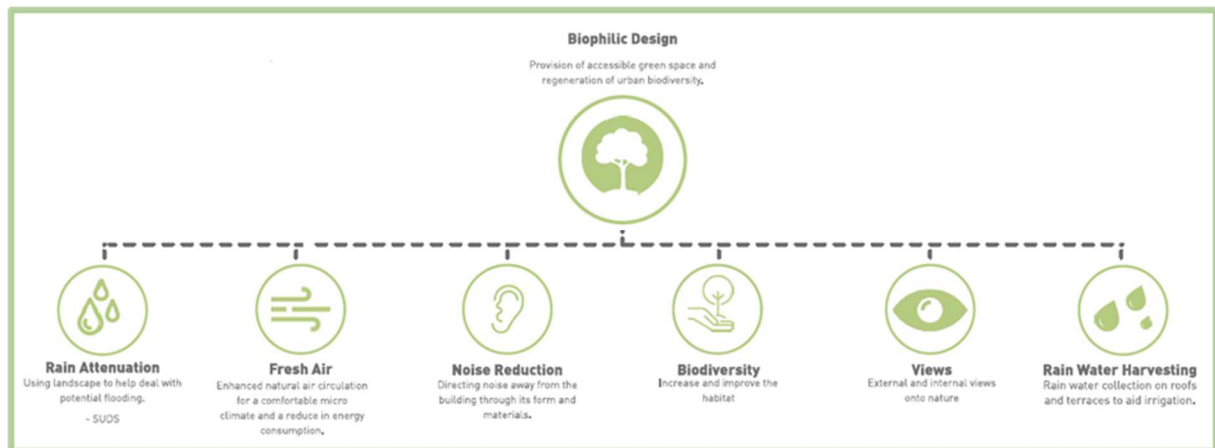
Access to green space improves our mental wellbeing, reducing the need to treat anxiety and mental health conditions. Depressive disorders are now the foremost cause of disability in the middle and high-income countries and can be precursors to chronic physical health problems.

Spending time in green spaces has been shown to produce levels and patterns of chemicals in the brain associated with low stress and positive impact on blood pressure. Positive links have also been demonstrated between how well people perform at attention demanding tasks and time spent, either beforehand or during, in green spaces.

There have been numerous studies over the last 35 years on the benefits to the built environment through improving a connection to nature with Biophilic Design (See Figure 5.2) helping developments become more calming and restorative with 7-8% less crime attributed to areas with access to nature.



Figure 5.2 – Biophilic Design



In support of the same, the No 3. Circle Square development provides good access to a range of outdoor green spaces within the wider Circle Square development area, including both the Symphony Park and Symphony Gardens areas.

## 5.10 Management

In order to minimise the impact of the development during construction and operation whilst providing a safe place to work, the proposals include for the following provision:

- Construction site impacts will be minimised, measures to protect water courses, as well as to prevent impacts upon the local area in terms of dust and noise pollution during construction works. This will be formalised through the submission of a Construction Management Plan prepared by the contractor.

## 5.11 Manchester City Councils Green and Blue Infrastructure Strategy

The River Medlock runs close to the development site providing an attractive setting for external areas and associated amenities. This will provide an opportunity to encourage access to part of the city centre's Blue Infrastructure. Investment into the public realm in the form of public green space within the wider Circle Square development will provide a further steppingstone to overall improve connectivity and accessibility to Green and Blue Infrastructure within the city.

The formation of gardens, and parks throughout the wider Circle Square development will be a key component as it will draw people through the development and to help create successful neighbourhoods and support the city's growth, as well as creating ecology corridors to enhance ecology both on-site and within the wider area.

Pollution Prevention Guidance will be adhered to by the main contractor in respects to air (dust) and water (ground and surface) pollution during the demolition and construction phase to prevent any degradation of existing Green and Blue Infrastructure.



## 6. ENERGY AND CARBON STRATEGY

### 6.1 Energy Strategy

In essence, the Energy Strategy produced by Crookes Walker Consulting for the Circle Square 3 development focuses on a holistic and multi-faceted method of improving the building's performance by applying an enhanced fabric-led approach to limiting demand side energy loads, allied to improvements in the efficiency of the mechanical and electrical systems and the inclusion of renewable and low carbon energy technology. The design measures outlined in the Energy Strategy comply with the policy requirements as set by the Manchester City Council's Core Strategy.

#### 6.1.1 Build Fabric and Thermal Performance

The standard measurement of heat transfer through a given building material or construction type is the U-value ( $\text{W/m}^2\text{K}$ ); the lower the U-value, the more slowly heat transfers and is lost out of a building.

In buildings, heat loss generally occurs through the following areas and elements of the construction:

- Ground Floor;
- External Walls;
- Roofs;
- Doors and Windows;
- Thermal (cold) Bridging; and,
- Uncontrolled Ventilation.

Table 6.1 presents the fabric parameters proposed for limiting heat loss and improving the building performance for proposed development.

*Table 6.1 - Fabric Parameters*

| Construction Element | Proposed Fabric Specification             |
|----------------------|-------------------------------------------|
| Ground Floor         | $U=0.10 \text{ W/m}^2\text{K}$            |
| External Wall        | $U=0.20 \text{ W/m}^2\text{K}$            |
| Roof                 | $U=0.10 \text{ W/m}^2\text{K}$            |
| Windows              | $U=1.60 \text{ W/m}^2\text{K}$ , $g=0.35$ |
| Air Permeability     | $3.0\text{m}^3/\text{hm}^2$ (@50Pa.)      |

These specifications and design attributes will provide the following benefits:

- **High performance thermal insulation** throughout the building envelope (ensuring low U-values for all heat loss elements) and thermally efficient windows and doors will minimise heat loss through the main building elements;
- **Thermally efficient windows** will be specified with argon gas fill and low emissivity coatings to limit heat loss through the panes. The glazing g-value will be specified to optimise beneficial solar gains but limit the propensity for the building to overheat;



- **Low air permeability** of  $3.0\text{m}^3/\text{hm}^2$  (@50Pa.) is targeted for this build in order to minimise uncontrolled ventilation. This will further reduce heat losses and provide high levels of occupant comfort (in combination with the proposed mechanical ventilation strategy). Focus on the quality of the build is vital to deliver such airtight buildings;
- **Attention to cold bridging junctions** including the provision of insulation to reduce heat and limit heat losses that occur at the junctions between building elements and around openings and will significantly improve the emission rate of the development.

This specification will help to deliver an energy efficient development that achieves an emission rate reduction and fabric energy efficiency performance significantly beyond the requirements set by building regulation Part L (2013).

### 6.1.2 Building Services Specification

In addition to the improvements in the building fabric and thermal performance, a number of measures to improve the energy efficiency of the building systems have also been considered for the scheme. The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the buildings is presented in Table 6.2.

*Table 6.2 - Mechanical and Electrical Specification*

| Building Services Systems                                                         | Proposed Services Specification                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| Air Source Heat Pumps (Cooling)                                                   | 2.73 (EER) 4.45 (ESEER)                                          |
| Air Source Heat Pumps (Heating)                                                   | 2.44 (COP) 4.01 (SCoP)                                           |
| Water Source Heat Pump (DHW)                                                      | 4.97 (COP) 3.25 (SCoP)                                           |
| MVHR SFP                                                                          | Supply I Extract – 1.17 W/l/s                                    |
| MVHR Heat Recovery                                                                | 84.2% (dry) 91.4% (wet)                                          |
| Lighting                                                                          | 100% LED                                                         |
| Luminaire Efficacies                                                              | $4.5\text{ W/m}^2 - 8.0\text{ W/m}^2$                            |
| Lighting Controls – Offices, Reception, Gym, Circulation, Toilets, Changing Rooms | Presence Detection Sensors                                       |
| Daylight Dimming – Offices, Reception                                             | 6.0m Perimeter Zones                                             |
| Constant Illuminance Control – Offices Only                                       | Yes                                                              |
| Solar Photovoltaic                                                                | Approximately $620\text{m}^2$ and 127,300kWh Generation Capacity |

This mechanical and electrical specification will deliver a Building Regulation Part L2A (2013) compliant scheme and will provide the following benefits:

- **Mechanical ventilation with heat recovery (MVHR)** systems will be specified to maintain a healthy environment and further reduce the heat losses and the energy demand of the development. The design air permeability of  $3.0\text{m}^3/\text{hm}^2$  (@50Pa.) will virtually eliminate uncontrolled ventilation and



ensure that the majority of the expelled stale air will pass across the heat exchanger, thereby boosting the energy reduction potential of these systems;

- **LED lighting** will be specified throughout the scheme to maximise operational efficiencies and lifespan of the fittings. LEDs operate with an estimated energy efficiency of up to 90% when compared to traditional lighting and conventional light bulbs. This means that about c.90% of the electrical energy is converted to light, rather than wasted heat as in conventional bulbs.
- **Air Source Heat Pumps (for water heating):** are a low carbon solution that are ideal for non-residential spaces. They are highly efficient method of producing heat as ASHPs collect low-grade heat from the air to supply useful heat for water heating requirements by applying additional energy input (in the form of electricity).

## 6.2 Energy Performance Calculations

In order to demonstrate the environmental benefits associated with the energy strategy for the commercial development, representative Simplified Building Energy Models (SBEM) have been completed using the IES Virtual Environment software. It should be noted that these results are indicative of the overall demand for energy.

Table 6.3 below presents a summary of these calculations, which show the regulated energy demand and emission reductions achieved by the enhanced material specification and the specification of energy efficient systems for the development.

*Table 6.3 – Energy Calculations*

| Unit     | BER<br>(kgCO <sub>2</sub> /m <sup>2</sup> /year) | TER<br>(kgCO <sub>2</sub> /m <sup>2</sup> /year) | % Improvement |
|----------|--------------------------------------------------|--------------------------------------------------|---------------|
| Offices  | 12.4                                             | 21.5                                             | 42.32         |
| Cafe     | 36.9                                             | 57.6                                             | 35.94         |
| Retail 1 | 18.2                                             | 35.6                                             | 48.88         |
| Retail 2 | 19.7                                             | 40.3                                             | 51.12         |

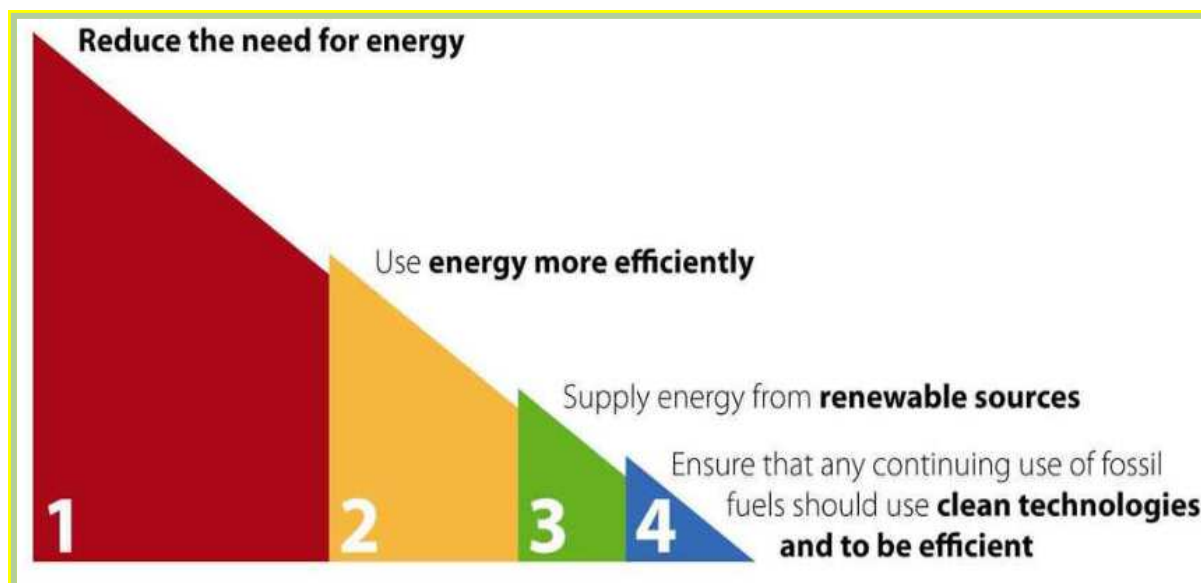
The calculations show that there is an expected improvement of between 35.94% and 51.12% over Part L2A of the Building Regulations (2013) for the separate building areas within the development. Again, this is in compliance with the targets for non-domestic buildings as per the Policy EN 6 - Target Framework for CO<sub>2</sub> Reductions from Low or Zero Carbon Energy Supplies of the Manchester Core Strategy.

## 6.3 Energy Hierarchy

The No.3 Circle Square scheme will incorporate a significantly enhanced material specification along with high quality design and construction standards in order to improve the whole building energy efficiency through a 'fabric led' energy strategy. The proposed construction, design and specification will deliver a scheme that is inherently energy efficient during occupation.

The energy hierarchy provides a framework to guide energy policy and decision making to achieve practical and cost-effective carbon emission reductions. The hierarchy prioritises demand-side activities to reduce wastage and improve efficiency (see Figure 6.1).



*Figure 6.1 – The Energy Hierarchy***First Principle:**

The following efficiency measures are designed to reduce heat losses and minimise energy demand:

- The building will be constructed with high specification materials and design criteria which exceed current minimum Building Regulation standards and includes numerous efficiency measures designed to reduce heat losses and minimise energy demand.
- Heating systems will be provided with zonal, programmable thermostatic controls. Which will allow occupants to control zones within their units independently for maximum flexibility. This is intended to reduce the demand for additional energy usage.

**Second Principle:**

The approach taken for this Scheme will help to minimise energy demand and associated carbon dioxide emissions and is aligned with the second principle of the energy hierarchy which states that reduction in energy demand should be achieved initially by energy efficiency.

To this effect, the following measures have been proposed:

- The design air permeability target for the buildings is  $3.0\text{m}^3/\text{hm}^2$  (@50Pa.). This low air permeability target will assist to limit the heat loss through the structure of the building;
- High efficiency air handling units with heat recovery capture 'waste' heat from the extracted stale air;
- The g value within the buildings will be optimised to control solar gain in the summer months and allow beneficial gains in the winter season to minimise the overheating risk and limit the heating energy demand within the units; and
- 100% LED provision and sophisticated control systems for the space within the buildings will also ensure the energy consumed is used efficiently. Photocell switching and automatic presence control of the lighting will be specified in order to further improve the efficiency of the lighting system.



### Third Principle:

Renewable and low carbon technology will form a key element of the scheme, which is designed to be an exemplar development in terms of its overall sustainability and operational energy performance. In support of this the following renewable and low carbon technologies are to be included within the development:

- **Air Source Heat Pumps** collect low grade heat from the air to supply useful heat for space and water heating requirements by applying additional energy input (in the form of electricity).
- **Water Source Heat Pumps** collect low grade heat from local bodies of water to supply useful heat for water heating requirements only, by applying additional energy input (in the form of electricity).
- **Solar Photovoltaic** panels harness solar thermal energy and convert it into electricity which can then be used within a building.

### Fourth Principle:

Remaining 'small heat' loads will be met by direct electric heating, operating at 100% efficiency at point of consumption. Cooling loads will be met by high efficiency air source heat pumps.

The full electric strategy therefore ensure that continuing use of fossil fuels is via clean, efficient technology. Furthermore, as the UK electricity grids' CO<sub>2</sub> footprint continues to improve, so too would the carbon dioxide emissions associated with the operational phase of the proposed scheme which benefits from a 'full electric' energy strategy.

## 6.4 TM54: Evaluating Operational Energy Performance

The TM54 methodology calculates predicted in-operation energy use and provides designers and building owners with clear guidance on how to evaluate operational energy use more fully, and accurately, at the design stage.

It takes into account variability based on uncertainty within the input data, giving upper and lower expectations. It is a more robust alternative to relying on information from SBEM, which is intended for compliance checks only and may not give reliable predictions of operational performance.

In order to assess the operational energy performance at No. 3 Circle Square, Crookes Walker Consulting have undertaken energy modelling in accordance with the TM54 methodology.

At this stage, the following design criteria have been determined and inputted into the energy model:

- Operating hours;
- Occupancy;
- Small power;
- Server room energy;
- Auxiliary fan and pump energy;
- Weather;
- Lighting Energy;
- Lifts & escalators energy;
- Catering Energy;
- Hot water consumption;
- Management Factors;



In accordance with TM54, several alternative scenarios have been modelled that explicitly consider the possibility of changes to how the building is used, how it is managed, and the effect of the weather, along with any other changes the modeller deems necessary to capture building energy performance.

A “Mid” Case energy model has been defined which reflects expected occupancy and equipment loads with detailed HVAC system modelling, “typical” weather and central case management factors for servicing systems and equipment and uses reference year weather data.

In addition to the “Mid” Case energy model, additional scenarios that take account of likely variations in occupancy, management factors and more extreme weather have been modelled. These are summarised in the following table:

*Table 6.4 – Operational Energy Performance*

|                                                                        | Low                                           | Mid                                           | High                                          | CWC Mid                                       |
|------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Occupancy Density                                                      | 12                                            | 10                                            | 8                                             | 10                                            |
| Operating Hours / Days                                                 | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Heating & Cooling Set Points                                           | 21°C Heating<br>24°C Cooling<br>16°C set back | 21°C Heating<br>24°C Cooling<br>16°C set back | 21°C Heating<br>24°C Cooling<br>16°C set back | 21°C Heating<br>24°C Cooling<br>16°C set back |
| Heating & Cooling Hours / Days                                         | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Out of Hours Heating / Cooling Provision                               | Heating night<br>set back                     | Heating night<br>set back                     | Heating night<br>set back                     | Heating night<br>set back                     |
| Ventilation Rates (litres/second/person)                               | 12l/s/person                                  | 12l/s/person                                  | 12l/s/person                                  | 12l/s/person                                  |
| Ventilation Hours / Days                                               | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Out of Hours Ventilation Provision                                     | None                                          | None                                          | None                                          | None                                          |
| Domestic Hot Water Provision<br>(litres/person/day)                    | 8                                             | 8                                             | 8                                             | 8                                             |
| Office Small Power Loads (W/m <sup>2</sup> )                           | 8 W/m <sup>2</sup>                            | 15 W/m <sup>2</sup>                           | 25 W/m <sup>2</sup>                           | 11 W/m <sup>2</sup>                           |
| Office Small Power Hours / Days                                        | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Office Out of Hours Small Power Provision                              | 20%                                           | 20%                                           | 20%                                           | 20%                                           |
| Common Areas Small Power Loads (W/m <sup>2</sup> )                     | 5 W/m <sup>2</sup>                            | 5 W/m <sup>2</sup>                            | 5 W/m <sup>2</sup>                            | 5 W/m <sup>2</sup>                            |
| Common Areas Small Power Hours / Days                                  | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Common Areas Out of Hours Small Power<br>Provision (W/m <sup>2</sup> ) | 1 W/m <sup>2</sup>                            | 1 W/m <sup>2</sup>                            | 1 W/m <sup>2</sup>                            | 1 W/m <sup>2</sup>                            |
| Lighting Hours / Days                                                  | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Lighting Power Provision (W/m <sup>2</sup> )                           | 6 W/m <sup>2</sup>                            | 6 W/m <sup>2</sup>                            | 6 W/m <sup>2</sup>                            | 4.5 W/m <sup>2</sup>                          |

The UKGBC (United Kingdom Green Building Council) have published energy performance targets for commercial offices that are aiming to achieve net zero carbon in operation. These targets are summarised in the following table:



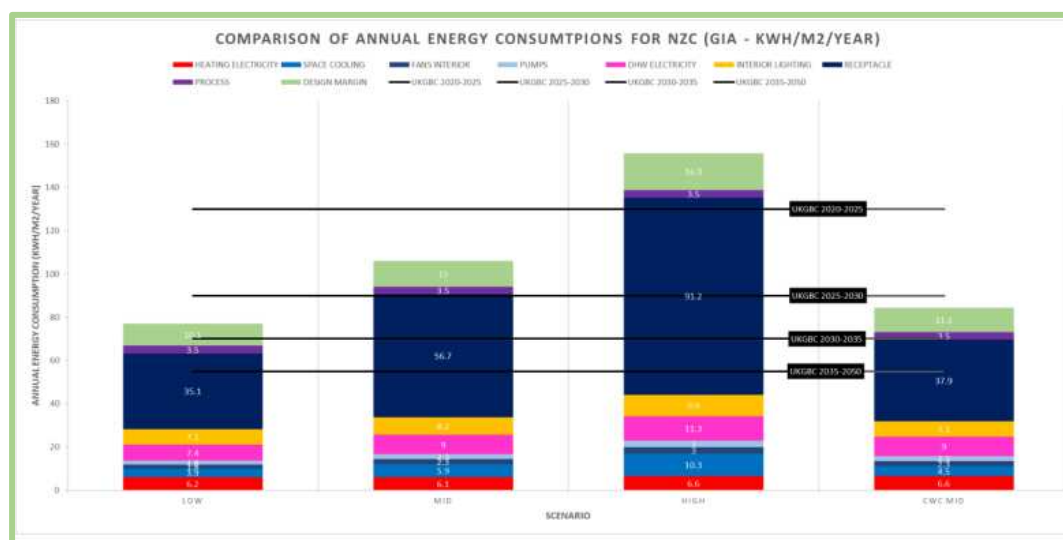
Table 6.5 – Energy Intensity Targets for Buildings targeting Net Zero

| Scope                 | Metric                                        | Interim Targets |           |           | Paris Proof Target |
|-----------------------|-----------------------------------------------|-----------------|-----------|-----------|--------------------|
|                       |                                               | 2020-2025       | 2025-2030 | 2030-2035 | 2035-2050          |
| Whole building energy | kWh <sub>e</sub> /m <sup>2</sup> (NLA) / year | 160             | 115       | 90        | 70                 |
|                       | kWh <sub>e</sub> /m <sup>2</sup> (GIA) / year | 130             | 90        | 70        | 55                 |
|                       | DEC rating                                    | D90             | C65       | B50       | B40                |
| Base building energy  | kWh <sub>e</sub> /m <sup>2</sup> (NLA) / year | 90              | 70        | 55        | 35                 |
|                       | kWh <sub>e</sub> /m <sup>2</sup> (GIA) / year | 70              | 55        | 45        | 30                 |
|                       | NABERS UK star rating                         | 4.5             | 5         | 5.5       | 6                  |
| Tenant energy         | kWh <sub>e</sub> /m <sup>2</sup> (NLA) / year | 70              | 45        | 35        | 35                 |

NLA = net lettable area      GIA = gross internal area

Bruntwood are aiming for an energy intensity of 55kWh<sub>e</sub>/m<sup>2</sup>(GIA)/yr or less and a DEC rating of B40, with a minimum requirement of 90kWh<sub>e</sub>/m<sup>2</sup>(GIA)/yr or less and a DEC rating of C65. As Table 6.5, above, shows this translates to a minimum requirement to meet the UKGBC 2025-2030 interim target and an aspirational aim to achieve the 2035- 2050 “Paris Proof Target”.

As modelled in Table 6.4, the building performance in terms of energy intensity (kWh/m<sup>2</sup> /year GIA) is as follows:

Figure 6.2 – Building Performance in Terms of Energy Intensity (kWh/m<sup>2</sup>/yr GIA)

As per Table Figure 6.2 (above), the worst-case result (High scenario) yields an annual energy intensity figure of 155.7kWh/m<sup>2</sup> /yr. Whilst this exceeds the Bruntwood minimum target of 90kWh/m<sup>2</sup> /yr (UKGBC 2025-2030 interim target), this is a worst-case scenario and so is not a fair reflection of building performance.

The Low scenario largely ties in with the LETI Climate Emergency Design Guide criteria for commercial offices and so despite being ambitious, it should be considered as a feasible scenario for the building. The Low scenario modelling outputs indicated an annual energy intensity figure of 76.9kWh/m<sup>2</sup> /yr which comfortably exceeds the Bruntwood minimum target of 90kWh/m<sup>2</sup> /yr (UKGBC 2025-2030 interim target) and comes close to the UKGBC 2030-2035 interim target of 70kWh/m<sup>2</sup> /yr.



Crookes Walker Consulting have confirmed that the most realistic scenario to be the CWC Mid scenario (see Table 6.4) due to the lower equipment load that has been applied in accordance with NABERS design for performance (dfp) guidance. For reference, NABERS dfp guidance recommends an average load of 10-12W/m<sup>2</sup> across the office areas. The annual energy intensity figure for this scenario was 84.3kWh/m<sup>2</sup> /yr which exceeds the Bruntwood minimum requirement of 90kWh/m<sup>2</sup> /yr and meets the UKGBC 2025-2030 interim target.

On the basis of the above modelling provided by Crookes Walker Consulting, the aspirational target of 55kWh/m<sup>2</sup> /yr (UKGBC 2035-2050 Paris Proof Target) appears to be unachievable, however there are still refinements to be made to the energy model at the next design stage including; further diversification of loads and profiles, detailed HVAC modelling and rationalisation of assumptions currently made for areas where detail has not been available. Furthermore, the additional detail and refinement will allow for the removal of design margins. **All of this will contribute towards a significant reduction in energy intensity which should enable the aspirational target of 55kWh/m<sup>2</sup> /yr (UKGBC 2035-2050 Paris Proof Target) to be met.**

## 6.5 NABERS

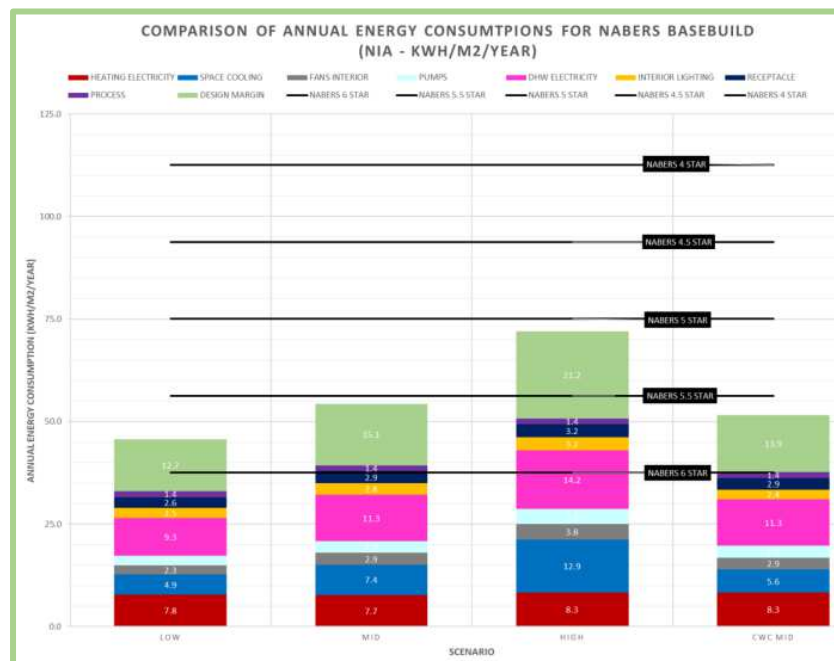
NABERS UK is an adaptation of the highly successful rating programme NABERS that operates in Australia. Launched in 1999, NABERS is widely considered to be a world leading environmental performance rating tool for commercial buildings. The highest achievable rating is 6-stars.

Bruntwood have targeted a NABERS 5-star rating as a minimum requirement, with an aspirational target of NABERS 5.5-star. In its current form, the building has an NIA (net internal area) of 24,989 m<sup>2</sup> and has a NIA by NABERS definition (the area of the evaluated building that is available to be tenanted or can be made to be tenanted under conditions set out in NABERS UK – The Rules, Section 4 – Rated Area).

The building has been assessed on 60 occupied hours per week (based on 12 hours/weekday).

In its current form and with the proposed systems and installations, the Base Building's energy consumption suggests that a NABERS 5.5-star rating is achievable.

*Figure 6.3 – Comparison of Annual Energy Consumption for NABERS Base Build*



As can be seen on the results graph above, all modelled scenarios, excluding the High scenario, achieve a NABERS 5.5-star rating. All scenarios meet the Bruntwood minimum requirement of a NABERS 5-star rating.

To achieve a NABERS 6-star rating, the annual energy intensity would have to reduce to 37.5kWh/m<sup>2</sup>/yr, a 8.5kWh/m<sup>2</sup>/yr reduction from the current Low scenario result. Following improvements of power efficiencies and technology during the buildings life cycle, theoretically the building should be capable of closing this gap and achieving an improved NABERS rating.

For reference see below summary of energy intensity limits for each NABERS rating based on the proposed NIA of the building:

*Figure 6.4 – NABERS rating and Energy Intensity Limit*

| NABERS Rating | Energy Intensity Limit (kWh/m <sup>2</sup> /yr) |
|---------------|-------------------------------------------------|
| 6 Star        | 37.5                                            |
| 5.5 Star      | 56.3                                            |
| 5 Star        | 75.1                                            |
| 4.5 Star      | 93.8                                            |
| 4 Star        | 112.6                                           |

Note that for NABERS ratings, the energy intensity value should not include energy associated with any of the following:

- Lighting within the NIA
- Plug loads such as office equipment within the NIA
- Stand-alone domestic hot water units in the NIA
- Local pollutant ventilation fans in the NIA
- Local air conditioning energy in the NIA
- Electric vehicle charging points
- Antennas/transmission towers
- Services to non-office spaces

## 6.6 Life Cycle Assessment

Life cycle assessment (LCA) is a method for evaluating the environmental load of processes and products during their life cycle from cradle to grave. It attempts to identify the environmental effects during all stages of the life of a product and produces a figure that represents the environmental load of a product. It is a process that is becoming more widely adopted in the context of national and international environmental regulations.

Increasingly, building designers are looking at some or all the steps of the building lifecycle to guide their decisions; from raw material to manufactured product; including extraction of the materials; energy consumption; manufacture; transportation; use; recycling; and final disposal or end of life.

Life cycle assessment effectively means the designer looks at what happens before and after the final product is used by the building occupant, measuring effects over a typical building's life. A BREEAM compliant LCA for



example is conducted over 60 years as standard, though other certifications have different or no standardised building lifespan.

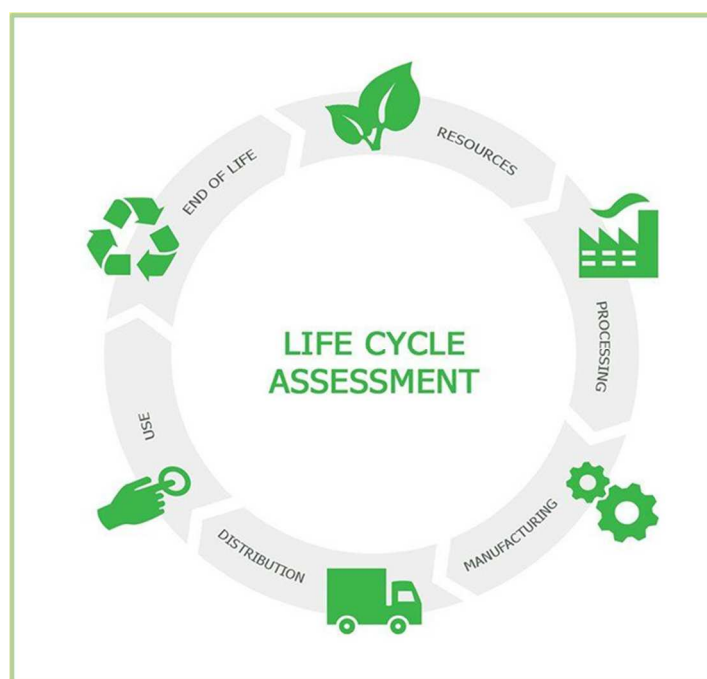
Designers can also use LCA to compare options to find the best balance of cost, durability, overall environmental impacts, functionality, and aesthetics.

For example, some building elements may be cheaper, but degrade faster than others. It may well be better value overall to select a more expensive product that does not need constant replacement. Undertaking an LCA allows the design team to make such informed decisions that would usually not be considered.

In a full LCA, the energy and materials used, along with waste and pollutants produced because of a product or activity are quantified over the whole life cycle.

The ISO 14040 standard refers to LCA as ‘the collection and assessment of the inputs and outputs of any potential environmental impacts caused by the product system throughout its life cycle’.

*Figure 6.5 – Lifecycle Stages of a Building*



The focus of the LCA is on the embodied carbon of materials sourced, manufactured, transported and disassembled – the operational energy and water use is not part of the analysis and the LCA will therefore not include calculations for the ‘in-use’ stage, which has instead been considered as part of the ‘TM54: Operational Energy Performance’ analysis (see Section 5.4).

#### 6.6.1 Scope

The LCA undertaken for this report will cover the RIBA Stage 2 Concept Design. The scope of this assessment has considered the superstructure of the Scheme only. Substructural elements (including hardscaping) and core building services have not been included in this study.

A ‘study boundary’ has been defined, as per the methodology set out in the BREEAM criteria for credit ‘Mat 01’, and the following life stages will be considered within this boundary:

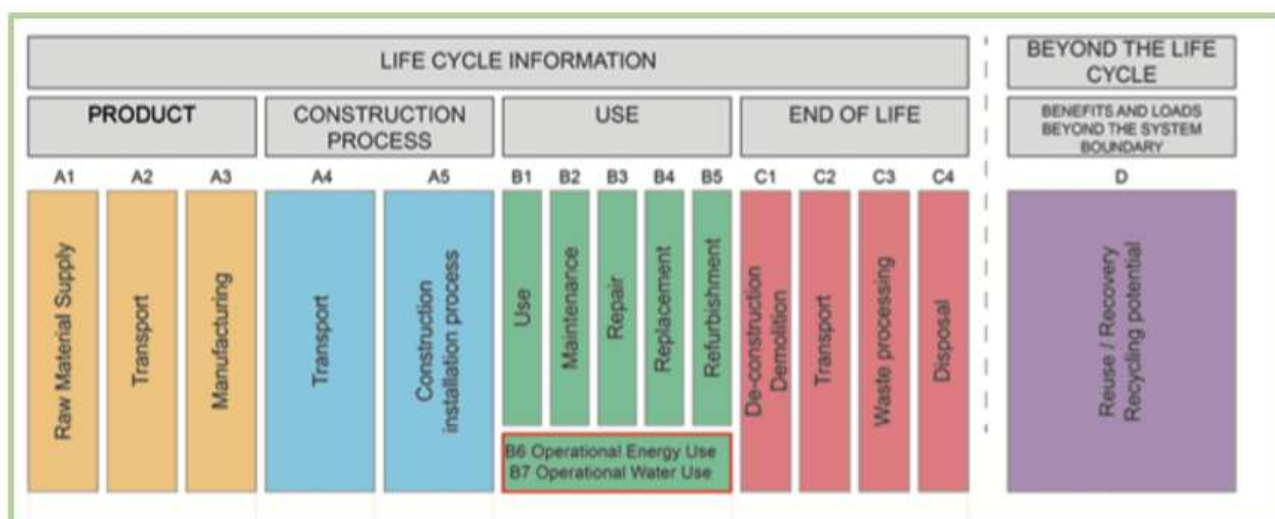


Figure 6.6 - LCA Study Boundary

- A1 – A3: Product Stage (raw materials, transport and manufacturing);
- A4: Transport activities during construction stage;
- A5: Construction of the project;
- B1 – B3: Use, maintenance and repair;
- B4 – B5: Material replacement and refurbishment; and
- C1 – C4: Deconstruction/ demolition activities and disposal.

The following image shows the life stages from the BS EN 15978: 2011 standards which have been used as the method for assessment.

Figure 6.7 – Assessment Scope



Source: Mayor of London Whole Life-Cycle Carbon Assessment Guidance

In line with the BREEAM methodology, operational energy and operation water (B6 and B7) has not been considered in the scope of this assessment. The focus of this analysis is on the environmental impacts of the projects, in particular the embodied carbon of the materials sourced, and energy consumed in the manufacturing, transportation, assembly and the end-of-life stage of the scheme.

Beyond the Life Cycle Stage (Scope D) has also not been considered as the project impacts fall outside the of the project's boundary and influence.

### 6.6.2 Methodology

The purpose of this report is to (a) benchmark the scheme's environmental impacts against a LCA benchmarking tool and (b) identify opportunities to reduce the environmental impact of the Scheme.

OneClick LCA Software has been used as an approved as a BRE IMPACT Compliant Tool.

The LCA undertaken for this report will demonstrate the environmental impact of the project in terms of the Global Warming Potential (GWP) of the Scheme (which is representative of the carbon and other greenhouse gases (denoted in Kg CO<sub>2</sub>equivalent) emitted as a result of the construction of the project.



The LCA will cover a period of 60 years in line with the methodology outlined in the manual for BREEAM New Construction 2018 (UK), and covers the following superstructure construction elements in its scope for assessment:

*Table 6.4 - LCA Scope of Assessment - Superstructure*

| Building Element – Level 1 | Building Element – Level 2    | Building Element – Level 3                                                                                                                   |
|----------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Superstructure             | 1. Frame                      | 1. Steel frames<br>2. Space decks<br>3. Concrete casings to steel frames<br>4. Concrete frames<br>5. Timber frames<br>6. Other frame systems |
|                            | 2. Upper Floors               | 1. Floors                                                                                                                                    |
|                            | 3. Roof                       | 1. Roof Structure<br>2. Roof Coverings<br>3. Specialist roof systems<br>4. Rooflights, skylights and openings                                |
|                            | 4. Stairs and ramps           | 1. Stair or ramp structures                                                                                                                  |
|                            | 5. External walls             | 1. External enclosing walls above ground floor level<br>2. External enclosing walls below ground level<br>3. Solar or rain screening         |
|                            | 4. Windows and external doors | 1. External windows                                                                                                                          |

The person undertaking the assessment is a 'competent person', who has been trained in the use of the OnceClick LCA software. This person has no affiliation with a professional manufacturer.

### 6.6.3 Comparison of Construction Materials

This section of the report looks at the options proposed for reducing the carbon impact of the project, based on the findings from the previous section. The proposed recommendations derived in this section are from the result of detailed consultations with the following stakeholders:

- The Developer
- Architectural team;
- Structural engineers;
- Sustainability consultant; and
- BREEAM AP

The following table shows the recommendations proposed and the changes in GWP of each option over the lifetime of the project (60 years as per the BREEAM methodology)

Whilst structural aspects of the design are fixed due to supply chain constraints, it is clear that finishes contribute the next largest proportion of carbon, therefore the options assessment is based on this area.

We have assessed three potential construction options for the building:



Figure 6.8 – LCA Options Appraisal

|                        | CORE            | FRAME | FLOORS/CEILINGS                                    | CLADDING |
|------------------------|-----------------|-------|----------------------------------------------------|----------|
| OPTION 1<br>(BASELINE) | POURED CONCRETE | STEEL | POURED CONCRETE<br>SUSPENDED CEILINGS<br>CARPET    | BRICK    |
| OPTION 2               | POURED CONCRETE | STEEL | POURED CONCRETE<br>OPEN CEILINGS<br>CARPET         | BRICK    |
| OPTION 3               | POURED CONCRETE | STEEL | POURED CONCRETE<br>OPEN CEILINGS<br>LAMINATE FLOOR | BRICK    |

The three design options have differing impacts in terms of the impact of their construction materials.

#### 6.6.4 Results

The LCA Report produced by Element Sustainability demonstrates that the lowest overall carbon impact is from the open ceiling and laminate floor option (Option 3), based on early-stage information, see Figure 6.9 below:

Figure 6.9 - LCA Results &amp; Options Appraisal

| CATEGORY                           | OPTION 1             | OPTION 2             | OPTION 3             |
|------------------------------------|----------------------|----------------------|----------------------|
| A1-A3 MATERIALS                    | 17,205,206.00        | 14,023,021.00        | 13,773,943.00        |
| A4 TRANSPORTATION                  | 113,267.00           | 112,559.00           | 113,209.00           |
| A5 CONSTRUCTION                    | 1,735,801.00         | 1,497,073.00         | 1,463,251.00         |
| B4-B5 REPLACEMENT                  | 12,505,190.00        | 6,140,820.00         | 5,393,588.00         |
| B6 ENERGY                          | 21,714,576.00        | 21,714,576.00        | 21,714,576.00        |
| B7 WATER                           | 997,430.00           | 997,430.00           | 997,430.00           |
| C1-C4 END OF LIFE                  | 478,047.00           | 477,912.00           | 388,118.00           |
| TOTAL kgCO <sub>2</sub> e          | <b>54,749,516.00</b> | <b>44,963,391.00</b> | <b>43,844,116.00</b> |
| kgCO <sub>2</sub> e/m <sup>2</sup> | 1,862.42             | 1,529.52             | 1,491.45             |

| EMBODIED CARBON<br>(A1-A5, B1-B4,<br>C1-C4)                          | OPTION 1      | OPTION 2      | OPTION 3      |
|----------------------------------------------------------------------|---------------|---------------|---------------|
| TOTAL CARBON<br>EMISSIONS<br>(kgCO <sub>2</sub> e)                   | 32,037,511.00 | 22,251,385.00 | 21,132,109.00 |
| CARBON EMISSIONS<br>PER MSQ<br>(kgCO <sub>2</sub> e/m <sup>2</sup> ) | 1,089.82      | 756.93        | 718.85        |



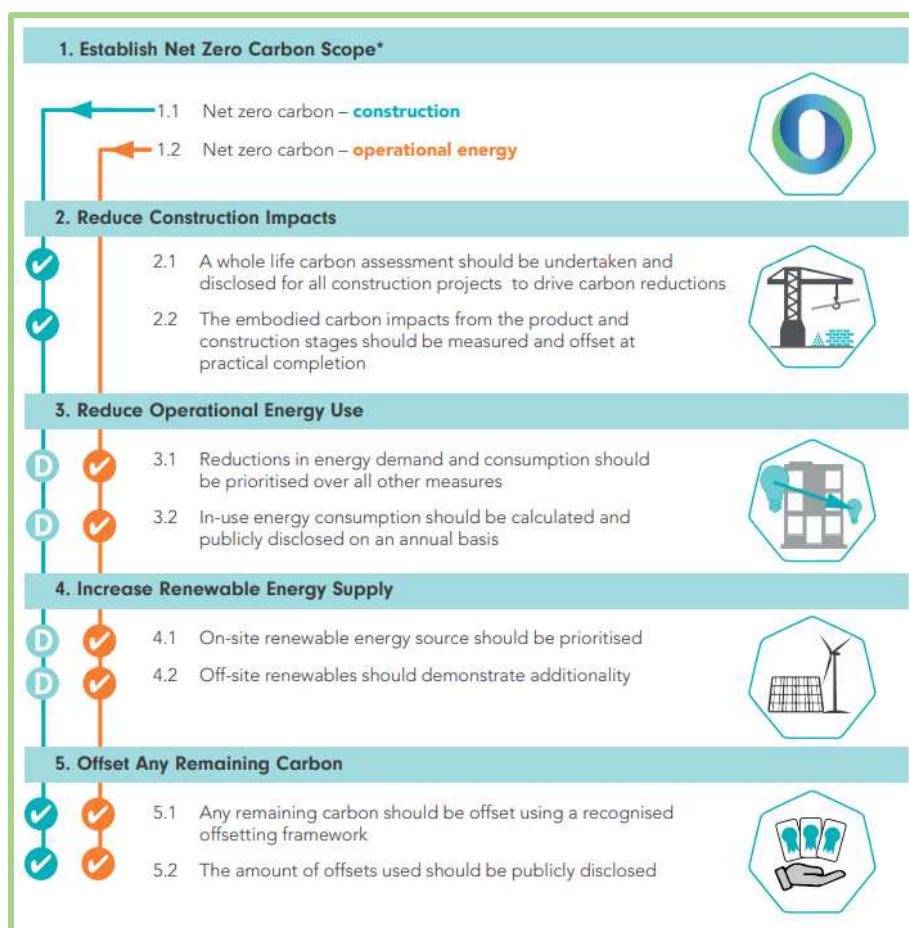
## 7. NET ZERO CARBON JOURNEY

The proposed development at No.3 Circle Square is intended to be a flagship development in terms of both energy use and carbon emissions and a key element of the building design has been focused around sustainability and carbon credentials.

In support of this, the proposed development has an ambitious target of being Net Zero Carbon, both in terms of operational energy use and embodied carbon as a result of construction materials.

In order for developments to demonstrate their Net Zero Carbon credentials the United Kingdom Green Building Council has identified a number of steps should be followed. These steps are outlined in Figure 7.1, below:

Figure 7.1 – Steps to achieving a Net Zero Carbon Building (Source UKGBC)



### 7.1 Embodied Carbon

#### 7.1.1 Life Cycle Assessment

In order to assess the embodied carbon associated with the No.3 Circle Square development, a Life Cycle Assessment Report has been prepared by Element Sustainability to help quantify the overall environmental



footprint of raw materials and energy from the cradle (i.e. when resources are extracted from the environment) to the grave (i.e. the end of life stage)(see Section 6.6 of this report).

The LCA Report provides an options appraisal, looking at how proposed construction materials could be replaced by other, less carbon intensive materials in order to reduce the overall embodied carbon of the materials and associated construction activities.

The findings of the LCA showed that the lowest overall carbon impact is from the open ceiling and laminate floor option (Option 3), based on early-stage information.

### 7.1.2 Net Carbon City – Key Principles (Construction)

#### Whole Life Carbon Analysis



Carry out whole life cycle carbon analysis of all building elements

#### Sourcing Materials



Ethical and responsible sourcing of materials.  
- Where possible, materials are to be sourced locally minimising emissions from transport.

#### Minimising Material Use



Minimise materials with high embodied energy impacts  
- Post tension slab in lieu of traditional concrete slab potentially reducing the amount of concrete and steel  
- Off-site manufacture reduces waste

#### Off-site Construction



Consider modular off-site construction systems  
- Unitized glazing panels  
Bathroom pods

#### Local Natural Materials



Promote use of local natural materials  
- Vegetation selection from native species  
- Natural internal materials – timber, wool  
- Water based paints where appropriate

#### Building Reuse



Design building for disassembly and the circular economy  
- Reappropriation of the building  
- Elements of the building to be used elsewhere



**Robust Detailing**

Detailing to be long life and robust  
Robust materials – unitized  
glazing/brick

**Target Zero Construction Waste**

Target zero construction waste  
diverted to landfill  
- Standardization  
- Designing the scheme to maximise  
repetition in unit size  
- A waste management plan will be  
produced during construction  
- Occupation, recycling facilities

**Disassembly and Circular Economy**

Design building for disassembly and  
the circular economy.

## 7.2 Operational Carbon

### 7.2.1 TM54: Evaluating Operational Energy Performance

To demonstrate compliance with the Net Zero Carbon performance of the building in operation, an analysis of the operational energy has been undertaken in accordance with TM54. The data extracted from the TM54 analysis has been used to assess the Energy Intensity Performance for the development, which has been compared to the UKGBC energy performance targets for buildings targeting net zero carbon.

This analysis (contained within Section 6.4 of this report) confirms that Crookes Walker Consulting have confirmed that the most realistic scenario for this development would be an annual energy intensity figure for of 84.3kWh/m<sup>2</sup> /yr. This exceeds the Bruntwood minimum requirement of 90kWh/m<sup>2</sup>/yr and meets the UKGBC 2025-2030 interim target.

Crookes Walker have also identified there are still refinements to be made to the energy model at the next design stage, including further diversification of loads and profiles, detailed HVAC modelling and rationalisation of assumptions currently made for areas where detail has not been available. Furthermore, the additional detail and refinement will allow for the removal of design margins. **All of this will contribute towards a significant reduction in energy intensity which should enable the aspirational target of 55kWh/m<sup>2</sup> /yr (UKGBC 2035-2050 Paris Proof Target) to be met.**

### 7.2.2 NABERS

To further review the proposed developments operational energy performance Crookes Walker Consulting have undertaken a NABERS assessment for the No.3 Circle Square development, with an aspiration to achieve a NABERS 5-star rating as a minimum requirement, with an aspirational target of NABERS 5.5-star.

As per the results contained in Section 5.5 of this report, the Buildings modelled energy consumption suggests that a NABERS 5.5-star rating is achievable in its current form and with the proposed systems and installations.



To achieve a NABERS 6-star rating, the annual energy intensity would have to reduce to 37.5kWh/m<sup>2</sup>/yr, a 8.5kWh/m<sup>2</sup>/yr reduction from the current Low scenario result. **Following improvements of power efficiencies and technology during the buildings' life cycle, theoretically the building should be capable of closing this gap and achieving an enhanced NABERS rating in line with the clients' aspirations.**

### 7.2.3 Net Carbon City – Key Principals (Operation)

#### Photovoltaic Array



PV array to be provided at roof level consisting of 448no. flat mounted modules.

#### Optimise Solar Gains



Good solar control will be provided to increase passive solar gains in winter.

#### Carbon Sequestration



Carbon sequestration (CO<sub>2</sub> offsetting) from the planting of new trees.

#### Sustainable Urban Drainage Systems (SuDS)



Extensive planting and public amenity space will support the Sustainable Drainage Systems (SuDS) by means of inception and transportation.

#### Recycling Facilities



Recycling facilities to enable the local authority waste reduction targets, diverting more materials away from landfill and reducing the occupants' carbon footprint further.

#### Cycle Store



Secure cycle storage and cyclist facilities.



### Travel Options



Travel options, including local access to transport nodes for bus and train reducing the number of journeys completed by car

### Proximity to Work, Shops and Amenity



Place of work, local amenities and shops are within easy walking distance of the site, enabling occupants to reduce the need for journeys completed by car.

### Electric Space Heating



The UK's grid is de-carbonising therefore there is potential for the building's emissions to reduce over time as the UK grid CO<sub>2</sub> footprint reduces so will the that of the No. 3 Circle Square South scheme.

## 7.2.4 Offsetting

As per the UKGBC 'Carbon Offsetting for Net Zero Carbon Buildings' Guidance, where a development has not been able to demonstrate that it has achieved 'net zero' status as a result of both its embodied carbon and operational carbon, any residual carbon emissions from construction or operation should be offset through an approved international or domestic carbon standard.

The frequency for the procurement of offsets shall be as follows:

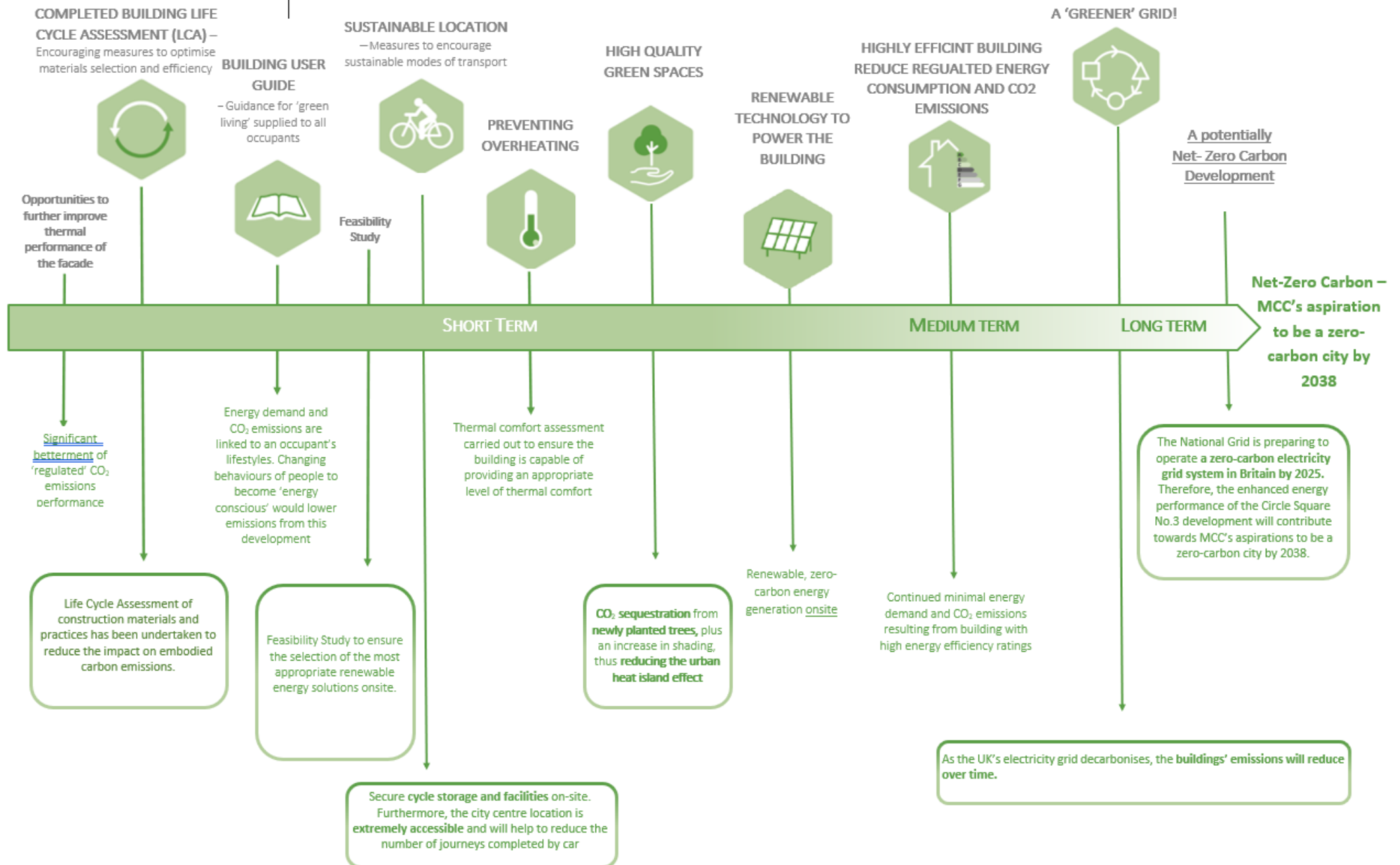
- For **'net zero carbon – construction'**, offsets shall be commensurate with the carbon impacts determined at practical completion. Exported renewable energy generated cannot be used to account for embodied carbon; refer to Section 3: Carbon Accounting for further details.
- For **'net zero carbon – operational energy'**, offsets shall be commensurate with the carbon impacts determined annually. Carbon emissions from electricity consumption shall be calculated using the relevant emission factors as listed within Table 12 of the UKGBC 'Carbon Offsetting for Net Zero Carbon Buildings' Guidance.



### 7.2.5 Manchester City Council Net Zero Carbon

In support of Manchester City Councils target to become a Net Zero Carbon City by 2038, the following timeline demonstrates an overview of the path towards a Net-Zero Carbon development through a series of short, medium and long-term, carbon mitigation measures and actions.





## 8. BREEAM

### 8.1 BREEAM

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for buildings.

BREEAM UK New Construction scheme is a performance-based assessment method and certification scheme for new non-domestic buildings. The primary aim of BREEAM UK New Construction is to mitigate the life cycle impact of new buildings on the environment in a robust and cost-effective manner. This is achieved through integration and the use of the scheme by clients and their project team at key stages in the design and construction process.

The building's performance is assessed under a number of categories, including:

- Energy;
- Water;
- Transport;
- Materials;
- Land Use;
- Pollution;
- Health and wellbeing; and
- Management.

The BREEAM rating benchmarks for BREEAM UK new construction projects assessed using the 2018 version of BREEAM are presented in Table 6.1 below.

*Table 8.1 – BREEAM Rating Benchmarks*

| BREEAM Rating | % Score Required |
|---------------|------------------|
| Outstanding   | ≥ 85             |
| Excellent     | ≥ 70             |
| Very Good     | ≥ 55             |
| Good          | ≥ 45             |
| Pass          | ≥ 30             |

There are minimum standards associated with the BREEAM 'Excellent' standard in terms of the building's energy and emission performance. However, to ensure that performance against fundamental environmental issues is not over-looked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas e.g. energy, water, materials etc.

A BREEAM 'Excellent' rating requires the following minimum performance standards, see Table 8.2.



Table 8.2 – Mandatory ‘Excellent’ Standards

| <i>BREEAM NC 2018 Issues</i>                         | <i>Minimum Standards for BREEAM for 'Excellent' rating</i>    |
|------------------------------------------------------|---------------------------------------------------------------|
| MAN 3: Responsible Construction Practices            | One credit (responsible construction management)              |
| MAN 4: Commissioning and Handover                    | One credit (commissioning-test schedule and responsibilities) |
| MAN 4: Commissioning and Handover                    | Criterion 11 (Building User Guide)                            |
| MAN 5: Aftercare                                     | One credit (commissioning - implementation)                   |
| ENE 01: Reduction of Energy Use and Carbon Emissions | Four credits                                                  |
| ENE 2: Energy Monitoring                             | One credit (First sub metering credit)                        |
| WAT 1: Water Consumption                             | One credit                                                    |
| WAT 2: Water Monitoring                              | Criterion 1 only                                              |
| MAT 3: Responsible Sourcing of Materials             | Criterion 1 only                                              |
| WST 03: Operational Waste                            | One credit                                                    |

## 8.2 Potential BREEAM Rating

A BREEAM UK 2018 Non-Domestic New Construction (Commercial: Office) – Shell and Core assessment has been prepared by a qualified, licensed BREEAM Assessor. This determines the feasible credits and potential BREEAM rating for No 3. Circle Square and demonstrates a commitment to the principles of good construction, design and sustainability.

### BREEAM Score and Rating – ‘Excellent’

Working alongside the qualified BREEAM assessor, the technical design team has reviewed the individual credit criteria and award of credits within the BREEAM assessment in order to optimise the building’s BREEAM performance. All credits allocated within this BREEAM assessment will require further technical verification and additional feasibility assessment during the formal Design Stage and Post Construction BREEAM assessment.

The current BREEAM Design Stage Tracker (presented in the Appendix of this Statement) show that the building is expected to perform as follows:

- Indicative building BREEAM score = **76.34%** (minimum required for BREEAM ‘Excellent’ = 70%)
- Indicative BREEAM rating = Potential for **BREEAM ‘Excellent’ rating**.



Following an initial review of the proposals the BREEAM New Construction report demonstrates that the proposed development is able, in principle, to meet all mandatory credit requirements and achieve an overall BREEAM 'Excellent' for this development.

Details of the BREEAM credits targeted can be found in the Design Stage tracker in the appendix of this report.

### 8.3 BREEAM Credit Award Review

An overview of the BREEAM credit award for each issue is presented below. The BREEAM 2018 New Construction is presented within Appendix A of this document and contains a full commentary on the individual credit award and specification requirements.

#### 8.3.1 Management

##### *Project Brief and Design –*

- Stakeholder consultation covering project delivery and relevant third parties. This is to encourage an integrated design process and considering BREEAM performance targets early to influence decision-making and optimise building performance.

##### *Life Cycle Cost and Service Life Planning –*

- Reporting the capital cost of the building. This will promote the business case for sustainable buildings through the enhanced understanding of capital cost; and,
- An outline, entire asset elemental life cycle cost (LCC) plan and a component level LCC option appraisal will be carried out to improve design, specification, through-life maintenance and operation.

##### *Construction Site Impacts –*

To recognise and encourage construction sites that are managed in an environmentally and socially considerate, responsible, and accountable manner, the following will be carried out/implemented during the construction phase:

- All timber and timber-based products used on the project will be 'legally harvested and traded timber';
- The principal contractor will demonstrate sound environmental management practices and consideration for neighbours across their activities on-site; and,
- Site related energy and water impacts are monitored and reported to ensure ongoing compliance during the Construction, Handover and Close Out stages and to improve awareness and understanding for future projects. Construction site impacts will be minimised as follows:
  - Monitor, report and set targets for carbon dioxide or energy arising from site activities;
  - Monitor, report and set targets for water consumption arising from site activities; and,
  - Monitor and record data from the transport movements and impacts resulting from delivery of construction materials to site and construction waste from site.



### *Commissioning and Handover –*

The provision of the following processes and handover guidance will be provided to encourage a planned handover and commissioning process which will reflect the needs of the building occupants:

- A schedule of commissioning including optimal timescales, appropriate testing and commissioning of all building services systems and building fabric in line with best practice will be undertaken; and,
- Provision of a non-technical Building User Guide and user/operator training timed appropriately around handover and proposed occupation will enable building users to use and manage the building operations efficiently.

### 8.3.2 Health and Wellbeing

The development will seek to (where viable to do so) enhance the quality of the workspace in building by increased comfort, health and safety of building occupants, visitors and others within the vicinity.

#### *Visual Comfort –*

- Internal lighting systems will be designed to avoid flicker and provide appropriate illuminance (lux) levels. This will ensure best practice in visual performance and comfort for building occupants;
- Internal lighting will be zoned to allow for occupant control; and,
- The external lighting strategy will be designed to reduce unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

#### *Indoor Air Quality -*

- An indoor air quality plan will be produced, with the objective of facilitating a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building; and,
- The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building.

#### *Thermal Comfort -*

To ensure that appropriate thermal comfort levels are achieved throughout the design, and controls are selected to maintain a thermally comfortable environment for occupants within the building, the following will be undertaken:

- Thermal modelling will be carried out to appropriate standards;
- Projected climate change scenario(s) will be considered as part of the thermal model; and,
- The thermal modelling analysis will inform the temperature control strategy for the building and its users.



*Acoustic Performance –*

- The building will meet the appropriate acoustic performance standards and testing requirements in terms of:
  - Sound insulation;
  - Indoor ambient noise level; and,
  - Room acoustics.

This will ensure that the building's acoustic performance including sound insulation meets the appropriate standards for its purpose.

*Safety, Security and Surroundings –*

- Security needs will be understood and taken into account in the design and specification. This is to encourage effective measures that promote safe and secure use and access to and from the building.

### 8.3.3 Energy

*Reduction of CO<sub>2</sub> Emissions –*

- The energy performance of the development will exceed current building regulation Part L, 2A (2013) criteria in accordance with the current local planning policies and align with the BREEAM 'Excellent' mandatory requirements;
- The proposed approach to emissions reduction at this site will be through a fabric led energy strategy and efficient servicing, in accordance with the principles of the Energy Hierarchy; and,
- Low zero carbon technologies in the form of air and water source heat pumps, in conjunction with solar PV will be used for all space heating and hot water loads.

*Energy Monitoring –*

- Energy metering systems will be installed to enable energy consumption to be assigned to end uses; and,
- Sub-meters will be provided for high energy load and tenancy areas.

Energy monitoring/metering is a powerful tool to help facilities management to organise and manage their consumption, target certain areas of over-use and streamline controls to improve efficiency over time and seasons.

*External Lighting –*

- The specification of energy efficient light fittings for external areas of the development as follows:
  - o All new external light fittings within the construction zone will be dedicated low energy (LED); and,
  - o External light fittings will be controlled through a time switch or daylight sensor to prevent operation during daylight hours.



*Low Carbon Design -*

- A Passive Design and Low Zero Carbon Feasibility Report will be produced in order to investigate reductions in the energy demand of the building.

*Energy Efficient Transportation Systems -*

- An analysis of the transport demand and usage patterns will be undertaken to determine the optimum number and size of lifts; This would encourage the implementation of energy efficient and suitably sized systems, and,
- Energy efficient installations will be specified.

### 8.3.4 Transport

To further enhance the sustainable credentials of the proposals, a Transport Statement has been prepared by Curtins Consulting Limited.

- The proposed development is located within a highly sustainable location in terms of transport connections with basic facilities and amenities all within easy walking distance of the site; and,
- A site-specific travel plan based on the needs of the site has been undertaken to promote sustainable reductions in transport burdens.

*Transport Links –*

- The site benefits from excellent sustainable access opportunities and is well connected by existing walking routes to key trip attractors. Bus, rail and Metrolink train can also be used to easily access the site.
- There is a very good level of public transport provision in the area;
- Sustainable transport measures and facilities across the site will be maximised, the measures include:
  - 118no. cycle storage spaces will be provided along with facilities (e.g. showers and changing facilities);
  - The site is within close proximity to a range of local amenities; and,
  - The Accessibility Index for the site is  $\geq 8$  confirming the sustainable location of the site in relation to alternative transport nodes.

*Local Amenity Access -*

- Building users are able to walk to local amenities and shops within the Oxford Road area and along Deansgate; and,
- The site benefits from very good links to local amenity space and recreational facilities in support of a vibrant, diverse and inclusive community.

### 8.3.5 Water

*Water Consumption and Monitoring –*

- At present, appliances are graded on a scale from G (the least efficient) up to A++ (the most efficient). A water efficiency strategy will be determined for the site and will include for the provision of 'A' rated appliances and fittings as a minimum;
- The buildings will be specified with efficient water fixtures and controls. This will result in a reduction in water consumption (litres/person/day); The mandatory minimum criteria for the BREEAM 'Excellent' rating will be achieved and a potential improvement targeted, which is a 50% improvement over the set BRE water consumption baseline; and,
- Soft landscaped area will rely solely on precipitation throughout all seasons of the year.

#### *Water Leak Detection and Prevention -*

- The provision of a leak detection system capable of detecting a major water leak on the mains water supply. Leakage especially in the case of water can be a drain on the resource and particularly difficult to establish without data collection; and,
- Flow control devices that regulate the supply of water to each WC area/facility according to demand will be installed.

#### *Water Monitoring –*

- A water meter on the mains water supply to the building will be specified to monitor and manage consumption.

### 8.3.6 Materials

This development will contribute towards making more efficient use of non-renewable material resources and to reducing the lifecycle impact of materials used in construction.

#### *Materials Lifecycle Impacts –*

- Materials will be selected which have a low environmental impact throughout their life cycle for the main building elements; and,
- An IMPACT compliant Life Cycle Analysis (LCA) tool will be utilised and an assessment carried out to measure the environmental impact of the building. Through conducting a life cycle assessment and integrating its outcomes in the design decision-making process, the design team will use this tool to measure and aim to reduce the buildings environmental impact.

#### *Responsible Sourcing of Materials –*

- All timber used on the project will be responsibly sourced in accordance with the UK Government's Timber Procurement Policy;
- Responsible sourcing of materials will be managed by the contractor. All timber used within the development will be responsibly sourced, verified by either the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification standard (PEFC);
- Materials will be selected which have a low environmental impact throughout their life cycle;



- Suppliers and manufacturers who operate Environmental Management Systems will be prioritised; and,
- Consideration will be given to local sourcing of construction materials where feasible.

#### *Designing for Robustness –*

- Adequate protection will be provided for exposed elements of the building and landscaped areas, therefore minimising the frequency of replacement materials; and,
- Relevant building elements will incorporate appropriate design and specification measures to limit material degradation due to environmental factors.

#### *Material Efficiency –*

- At the Preparation, Brief and Concept Design RIBA stages; targets will be set, opportunities identified, and methods put in place to optimise the use of materials. This is to avoid unnecessary materials use arising from over specification without compromising structural stability, durability or the service life of the building.

### 8.3.7 Waste

#### *Construction Waste –*

Prior to commencement of the construction phase, a Construction Resource Management Plan will be produced by the developer to limit the on and off-site environmental impacts of construction. The waste management strategy will also include the following:

- Procedures to reduce construction waste related to on-site construction and off-site manufacture/ fabrication; and,
- Diverting non-hazardous construction (on-site and dedicated off-site manufacture/ fabrication), demolition and excavation waste (where applicable) generated by the project from landfill.

#### *Operational Waste –*

- Provision of suitable space and facilities to allow for segregation and storage of operational recyclable waste volumes generated by the building occupants and activities will optimise recycling rates; and,
- A waste management strategy will be developed, ensuring that adequately sized bin storage areas will be provided, access for collection personnel and vehicles has been established and other aspects of waste management is designed into the development at an early stage of the design. The strategy allows for storage of recyclable materials in order to optimise the recycling rates achieved by Manchester City Council.

#### *Adaptability to Climate Change –*

- The creation of a climate change adaptation strategy appraisal which will consider the mitigation measures for more extreme weather events arising from climate change over the lifespan of the building. This strategy aims to minimise the future need of carrying out works to adapt the building strategy to take account of more extreme weather changes resulting from climate change and changing weather patterns.



*Design for Disassembly and Adaptability –*

- A building specific adaptation strategy will be undertaken to encourage consideration and implementation of measures to accommodate future changes to the use of the building and its systems over its lifespan. This strategy will ensure that there is unnecessary materials use, cost and disruption arising from the need for future adaptation works 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.

### 8.3.8 Biodiversity

*Selection and Ecological Value of the Site –*

- The proposed re-development is located on an occupied site and will reuse the exiting building structure. This is an efficient use of land and resources;
- The land and retained building within the construction zone has been confirmed to be of low ecological value by the Suitably Qualified Ecologist;

*Minimising Impact on Existing Site Ecology and Enhancement –*

- A Suitably Qualified Ecologist, Penny Anderson Associates have been appointed and found that the existing building has the potential to enhance on site ecology;
- It is not anticipated that there will be a negative change in plant species richness.
- On-site measures for managing negative ecological impacts during site preparation and construction are implemented in-practice (e.g. mitigation measures to protect existing ecological features).
- Measures Will be implemented that enhance ecological value, which are based on input from the project team and Suitably Qualified Ecologist in collaboration with representative stakeholders.

*Long Term Ecology Management and Maintenance -*

- Measures will be implemented to manage and maintain ecology throughout the project.
- A Landscape and Ecology Management Plan will be developed in accordance with BS 42020:2013.

### 8.3.9 Pollution

*Impact of Refrigerants -*

- Systems will be specified to reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems; and,
- All systems will be either hermetically sealed or a permanent automated refrigerant leak detection system will be specified, that is robust and tested, and capable of continuously monitoring for leaks.

*Local Air Quality –*

- Poor air quality has a detrimental effect on humans, fauna and flora. Gases such as nitrous oxides (NO<sub>x</sub>) can react with other gases and environmental factors including sunlight to create substances that have a major impact on health and wellbeing. The 'full electric' energy strategy, will result in no local NO<sub>x</sub> emissions as the emissions are displaced elsewhere on the grid.

#### *Surface Water Management –*

- The development site is located partly within Flood Zone 1, and partly within Flood Zone 2. As such a site specific Flood Risk Assessment has been produced by Curtins Consulting Limited confirming that the site has a low probability of flooding.
- The developer commits to ensuring that the surface water runoff will be managed resulting in the peak rate and volume of surface water run-off will be no greater post-development than pre-development. The development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

#### *Reduction of Night-time Light Pollution –*

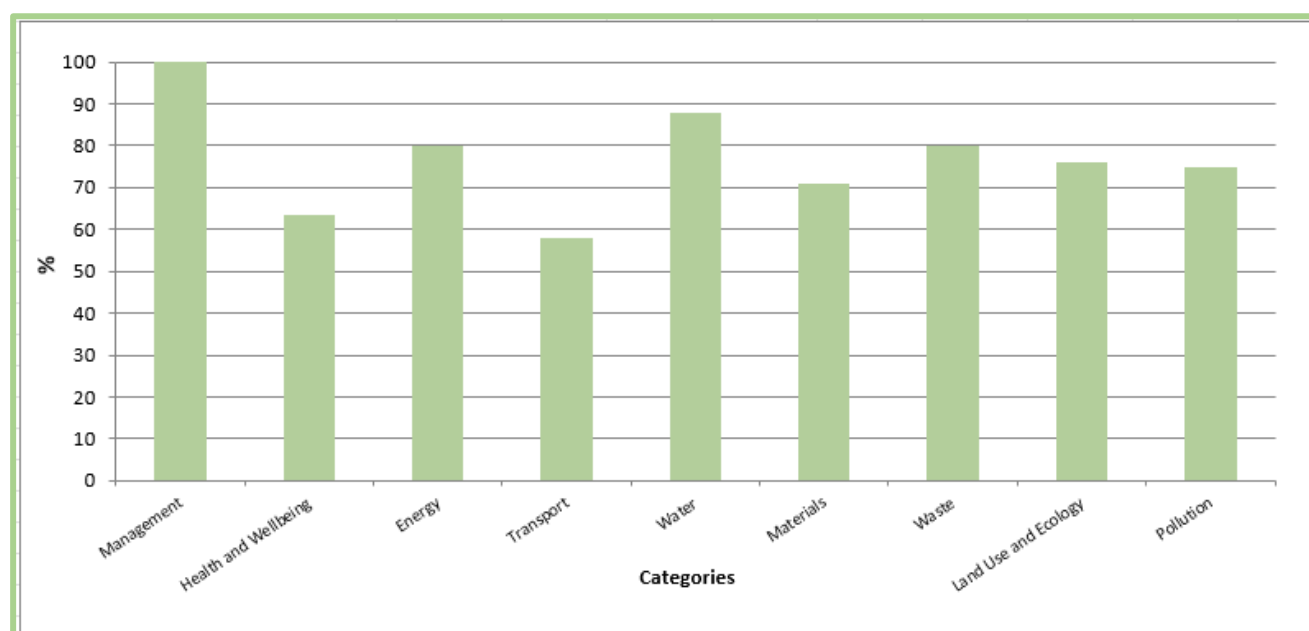
- The external lighting strategy will be designed to reduce unnecessary light pollution through effective design, minimising energy consumption and nuisance to neighbouring properties.

#### *Reduction of Noise Pollution –*

- A Noise Impact Survey will be produced demonstrating that the noise levels from the assessed building will be at least 5 Db lower than the background noise throughout the day and night.

Figure 6.1, below, demonstrates the percentage of credits targeted based on the total number of credits available for each section within the BREEAM assessment.

*Figure 8.1 – Percentage of credits targeted against credits available*



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## 9. CONCLUSION

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This Statement has reviewed the sustainability performance of the proposed No. 3 Circle Square development against national and local planning policies. The conclusion that can be drawn from the review is as per the following:

### Sustainability Performance –

- Water consumption of the development will be minimised through the specification of **efficient water fixtures**.
- The proposed scheme location promotes access **to sustainable transport options** and the design has prioritised pedestrians and cyclists over the private car. Provision of cycle storage and facilities, and access to regular busses and trains will contribute towards creating a highly connected and sustainable development, demonstrating compliance with the requirements of **CS Policy T1 – Sustainable Transport**.
- The development Site is located within Flood Risks Zone 1 and 2. A Flood Risk Assessment has been produced by Curtins Consulting Limited confirming that **the risk of flooding for the site is very low**, and post development surface water run-off rates will be **managed and mitigated through the implementation of SUDs** where applicable, demonstrating compliance with the requirements of **CS Policy EN 8 – Adaption to Climate Change**.
- Waste arising during construction and occupation/operation will be minimised through the **implementation of a Waste Management Plan**. The WMP will be used to ensure that there is adequate management and storage of construction waste takes place in line with the Council's policies. Opportunities for the possible recycling of construction waste from excavation works will also be considered in line with best practice.
- **A refuse management strategy** has been developed by Curtins Consulting Limited to manage waste and recyclables from the operational phase of the development. Source segregation and the provision of refuse areas will encourage the occupants to recycle and **divert waste away from landfills**.
- Materials are proposed to be **responsibly sourced and materials with low environmental impact** will be selected and local suppliers will be prioritised. Material selection will be carefully considered to avoid the use of toxic materials and materials with VOCs.
- The findings from the Preliminary Ecological Appraisal show that the existing site is currently assessed of being of limited ecological value, however there are **opportunities to enhance the site ecology and biodiversity through both planting and ecological protection and enhancement measures**.
- The development provides good access to a range of **outdoor green and blue spaces** within the wider Circle Square development area, including both the Symphony Park and Symphony Gardens areas, demonstrating measures in line with the **Green and Blue Infrastructure Strategy for Manchester**.
- A detailed **Life Cycle Assessment** has been undertaken in order to provide an overview of the embodied carbon associated with construction materials over the lifetime of the building. This report has provided an options appraisal in order for alternative, less carbon intensive materials to be specified.



- A **BREEAM Assessment** has been undertaken assessing the sustainability performance of the building. The development is targeting an '**Excellent**' rating and is expected to perform well against the BREEAM criteria, demonstrating an improvement over the requirements of **CS Policy DM 1 - Development Management**.

#### Energy And Net Zero Carbon Strategy –

The development will be designed and specified in accordance with **the principles of the energy hierarchy** and in line with the **targets and guidance set out in Manchester City Council's Core Strategy**.

- A combination of **enhanced building fabric** (beyond the regulatory compliance standard), efficient mechanical and electrical systems, and controls, will achieve compliance with the emission reduction targets stipulated by **Building Regulations Part L2A (2013)**;
- The non-domestic units also benefit from **air and water source heat pumps** specified to meet space and water heating requirements. These systems are extremely energy efficient and will play a significant role in reducing the development's carbon footprint;
- **Local controls** will be utilised to ensure maximum thermal comfort and energy savings; and
- Energy modelling calculates **significantly enhanced % emissions reductions over Part L2A (2013)** of the Building Regulations, demonstrating compliance with **CS Policy EN 6 - Target Framework for CO<sub>2</sub> Reductions from Low or Zero Carbon Energy Supplies** as follows:
  - Non-Domestic (Office) – 42.32% improvement over Part L2A Building Regulations.
  - Non-Domestic (Café) – 35.94% improvement over Part L2A Building Regulations
  - Non-Domestic (Retail 1) – 48.88% improvement over Part L2A Building Regulations
  - Non-Domestic (Retail 2) – 51.12% improvement over Part L2A Building Regulations
- A **TM54: Operational Energy Performance** analysis has been undertaken in order to assess the operational energy performance of the building. This analysis has been compared with UKGBC Energy Intensity Performance benchmarks in order to assess the Net Zero Carbon aspirations of the building. These results demonstrate that the development has the potential to achieve the target of 55kWh/m<sup>2</sup> /yr (UKGBC 2035-2050 Paris Proof Target) to be met.
- A **NABERS Assessment** has been undertaken demonstrating that, in its current form, the developments base build energy consumption is in line with the NABERS 5.5-star rating, with the potential to achieve a 6-star rating following improvements in power efficiencies and technology during the buildings life cycle.
- **Offsetting** encapsulating any residual carbon emissions from construction or operation will be offset through an approved international or domestic carbon standard.

In conclusion, the proposals reviewed within this statement for the scheme at No.3 Circle Square in Manchester will deliver a highly energy efficient and sustainable scheme, providing a quality development that accords with the guidance provided within the Manchester City Council' adopted planning policies.



APPENDIX A – BREEAM TRACKER

|  |  | Issue: 16/06/2022 |  |  |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  | W |  |
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| 9  | Main 03 | Monitoring of Construction Site Impacts (Energy and Water)                                                                                                                                 | Main Contractor sets targets, monitors and reports on energy and water consumption each month, based on site activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Main Contractor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                             | 0.61    | 1 | 0.61 | 0 | 0 | 0.61 | 0    | 0    | 1 | 0.61                                                | DESIGN STAGE EVIDENCE:<br>- Letter of Commitment<br>- Specification Clause<br><br>EVIDENCE PROVIDED:<br>- Commitment Letter                                       | COMPLETE FOR DESIGN STAGE                                                                                                                                                                                                                              | Main Contractor |     |  |
|    |         | Monitoring of Construction Site Impacts (Transport)                                                                                                                                        | Main Contractor monitors transport of materials from the factory gate to the building site, including any transport, intermediate storage and distribution; as well as Transport of construction waste from the construction gate to waste disposal processing/recovery centre gate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Main Contractor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                             | 0.61    | 1 | 0.61 | 0 | 0 | 0.61 | 0    | 0    | 1 | 0.61                                                | DESIGN STAGE EVIDENCE:<br>- Letter of Commitment<br>- Specification Clause<br><br>EVIDENCE PROVIDED:<br>- Commitment Letter                                       | COMPLETE FOR DESIGN STAGE                                                                                                                                                                                                                              | Main Contractor |     |  |
| 12 | Main 04 | Commissioning and Handover<br><b>Aim:</b> To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants.                            | Commissioning, Testing Schedule and Responsibilities<br><br><b>MINIMUM STANDARD</b><br><br>There is a schedule of commissioning and testing that identifies appropriate commissioning required for the scope of works that includes a suitable timescale for commissioning and re-commissioning of all relevant works carried out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | M&E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                             | 0.61    | 1 | 0.61 | 0 | 0 | 0.61 | 0    | 0    | 0 | 0                                                   | DESIGN STAGE EVIDENCE:<br>- Formal letter of commitment<br>- Specification Clause<br>- Construction Programme<br>- Commissioning Schedule<br>- Appointment Letter |                                                                                                                                                                                                                                                        | M&E             |     |  |
| 13 |         | Commissioning Design and Preparation                                                                                                                                                       | During the design stage, the client or the principal contractor appoints an appropriate project team member, provided they are not involved in the general installation works for the building services systems, with responsibility for:<br>a. Undertaking design reviews and giving advice on suitability for ease of commissioning.<br>b. Providing commissioning management input to construction programming and during installation stages.<br>c. Management of commissioning, performance testing and handover or post-handover stages.<br><br>For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | M&E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                             | 0.61    | 1 | 0.61 | 0 | 0 | 0.61 | 0    | 0    | 0 | 0                                                   | DESIGN STAGE EVIDENCE:<br>- Formal letter of commitment<br>- Specification Clause<br>- Construction Programme<br>- Commissioning Schedule<br>- Appointment Letter |                                                                                                                                                                                                                                                        | M&E             |     |  |
| 14 | Main 04 | Testing and Inspecting the Building Fabric                                                                                                                                                 | The project will be subject to both air-tightness testing and a continuity of thermal insulation inspection via thermographic testing.<br><br>Any defects identified in the thermographic survey or the airtightness testing reports are rectified prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building/element.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Main Contractor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                             | 0.61    | 1 | 0.61 | 0 | 0 | 0.61 | 0    | 0    | 0 | 0                                                   | DESIGN STAGE EVIDENCE:<br>- Formal letter of commitment<br>- Specification Clause<br><br>EVIDENCE PROVIDED:<br>- Commitment Letter                                | Element sent Letter of Commitment to Charlie Entwistle to sign and return (31.03.22).<br><br>To close out credit, evidence required to demonstrate compliance with Commissioning - testing schedule and responsibilities (Criterion 1 - 5). (27.04.22) | Main Contractor |     |  |
| 17 | Hea 01  | View Out                                                                                                                                                                                   | Where 95% of the floor area in relevant building areas is within 8m of a wall which has a window or permanent opening that provides an adequate view out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Architect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                             | 0.72    | 0 | 0    | 0 | 0 | 0    | 1    | 0.72 | 0 | 0                                                   | DESIGN STAGE EVIDENCE:<br>- Proposed GA and Elevation Drawings.<br>- Calculations.                                                                                |                                                                                                                                                                                                                                                        | Architect       |     |  |
| 18 | Hea 01  | Internal and External Lighting Levels, Zoning and Control                                                                                                                                  | <b>Internal Lighting:</b> All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts.<br>Internal lighting in all relevant areas of the building is designed to provide an illuminance (lux) level appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. This can be demonstrated through a lighting design strategy that provides illuminance levels in accordance with the SLL Code for Lighting 2012 and any other relevant industry standard. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 2 sections 3.3, 4.6, 4.7, 4.8 and 4.9.<br><br><b>External Lighting:</b> All external lighting located within the refurbishment or fit-out zone is designed to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. To demonstrate this, external lighting provided is specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas3 and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places<br><br><b>Zoning and Controls:</b> Internal lighting is zoned to allow for occupant control in accordance with the criteria below for relevant areas present within the building: In office areas, zones of no more than four workplaces.<br>Workstations adjacent to windows/atria and other building areas separately zoned and controlled.<br><br>EDUCATION SPECIFIC REQUIREMENTS: Manual lighting controls are easily accessible for the teacher while teaching and on entering or leaving the teaching space. Manual lighting controls need only be provided for staff, not the children. | M&E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                             | 0.72    | 1 | 0.72 | 0 | 0 | 0    | 0.72 | 0    | 0 | 0                                                   | 0                                                                                                                                                                 | DESIGN STAGE EVIDENCE:<br>- M&E Specification / Written Commitment (letter/email)<br>- Proposed Lighting Schedule.<br>- Proposed Lighting Drawings.                                                                                                    |                 | M&E |  |
| 19 | Hea 02  | Indoor Air Quality<br><b>Aim:</b> To recognise and encourage a healthy internal environment through the specification and installation of appropriate ventilation, equipment and finishes. | Indoor Air Quality Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | An indoor air quality plan to be produced and implemented, with the objective of facilitating a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during the design, construction and occupation of the building. The indoor air quality plan must consider the following:<br>• Removal of contaminant sources<br>• Dilution and control of contaminant sources<br>• Procedures for pre-occupancy flush out<br>• Protection of Heating/Ventilation and Air Conditioning (HVAC) systems from sources of pollution during refurbishment/fit-out works e.g. dust<br>• Procedures for protecting the indoor air quality of areas outside of the refurbishment or fit-out zone that may be affected by the refurbishment/fit-out works<br>• Procedures for identifying and implementing third party testing and analysis required to ascertain that the contaminant sources have been removed effectively before occupancy<br>• Commitments for maintaining indoor air quality in-use, e.g. maintenance and cleaning of the HVAC system, ductwork and filters. | Indoor Air Quality Consultant | Pre-req |   |      |   |   |      |      |      |   | DESIGN STAGE EVIDENCE:<br>- Indoor Air Quality Plan |                                                                                                                                                                   | Indoor Air Quality Consultant                                                                                                                                                                                                                          |                 |     |  |
|    |         |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                               |         |   |      |   |   |      |      |      |   |                                                     |                                                                                                                                                                   |                                                                                                                                                                                                                                                        |                 |     |  |

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| 20 | Hsa 02 | Ventilation                   | <p><b>CREDIT REMOVED FROM ASSESSMENT - NOT ACHIEVABLE</b></p> <p>The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows:</p> <p>a. Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation.</p> <p>b. Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building.</p> <p>c. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN15798-3:2017(45). The specified filters should achieve supply air classification of at least SUP 2.</p> <p>d. Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO<sub>2</sub>) or air-quality sensors specified and:</p> <p>i. In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space.</p> <p>ii. In naturally ventilated buildings or spaces: sensors either have the ability to alert the building owner or manager when CO<sub>2</sub> levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents.</p> <p>For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation</p> | M&E                         | 1                                                                                                                                                                                               | 0.72                | 0 | 0    | 0 | 0    | 0 | 0 | 0 | 0    | 0 |   |   |      |
| 21 | Hsa 04 | Thermal Comfort               | <p><b>Aim:</b> To ensure that appropriate thermal comfort levels are achieved through design, and controls are selected to maintain a thermally comfortable environment for occupants within the building.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Thermal Modelling           | Thermal modelling has been carried out using software in accordance with CIBSE L1 Building Energy and Environmental Modelling during the design stages.                                         | M&E                 | 1 | 0.72 | 1 | 0.72 | 0 | 0 | 0 | 0.72 | 0 | 0 | 1 | 0.72 |
| 22 | Hsa 04 | Thermal Zoning and Controls   | <p>The thermal modelling has informed the temperature control strategy for the building and its users.</p> <p>The strategy for proposed heating or cooling systems demonstrates that it has addressed the following:</p> <ul style="list-style-type: none"><li>-Zones within the building, and how the building services could efficiently and appropriately heat or cool these areas. For example consider the efficient requirements for the central core of a building compared with the external perimeter adjacent to the windows.</li><li>-The degree of occupant control required for these zones. This is based on discussions with the end users (or alternatively building type or use specific design guidance, case studies, feedback) and considers:<ul style="list-style-type: none"><li>- User knowledge of building services,</li><li>- Occupancy type, patterns and room functions (and therefore appropriate level of control required).</li><li>-How the user 'is likely to operate or interact with the systems, e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc.</li><li>- The user expectations (how they may differ in the summer and winter) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example some occupants like fresh air and others dislike draughts).</li></ul></li></ul>                                    | Thermal Zoning and Controls |                                                                                                                                                                                                 | M&E                 | 1 | 0.72 | 1 | 0.72 | 0 | 0 | 0 | 0.72 | 0 | 0 | 1 | 0.72 |
| 24 | Hsa 06 | Acoustic performance          | <p><b>Aim:</b> To ensure the building's acoustic performance including sound insulation meets the appropriate standards for its purpose.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Acoustic Performance        | <p>During the design stages the building meets the appropriate acoustic performance standards and testing requirements for the acoustic principles of:</p> <p>1. Indoor ambient noise level</p> | Acoustician         | 1 | 0.72 | 1 | 0.72 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0 | 0    |
| 25 | Hsa 06 | Safety and security           | <p>To recognise and encourage effective measures that promote safe and secure use and access to and from the building.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Security                    | A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to <b>Concept Design</b> (RIBA Stage 2 or equivalent).               | Security Consultant | 1 | 0.72 | 1 | 0.72 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0 | 0    |
| 26 | Hsa 07 | Safe and Healthy Surroundings | <p>There is an outside space providing building users with an external amenity area. The outside space must:</p> <ul style="list-style-type: none"><li>o be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky.</li><li>o have appropriate seating areas and be non-smoking.</li><li>o be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Outside Space               |                                                                                                                                                                                                 | Architect           | 1 | 0.72 | 1 | 0.72 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0 | 0    |

|       |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |   |      |   |      |   |   |   |   |   |      |   |      |                                                                                                                             |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                 |     |  |
|-------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|------|---|------|---|---|---|---|---|------|---|------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--|
| En 01 | Safe Access                                        | <p>Dedicated and safe cycle paths are provided from the site entrance to any cycle storage and connect to offsite cycle paths where applicable.</p> <p>Dedicated and safe footpaths are provided on and around the site providing suitable links for the following:</p> <p>a. The site entrance to the building entrance.</p> <p>b. Car parks (where present) to the building entrance.</p> <p>c. The building to outdoor space.</p> <p>d. Connecting to off-site paths where applicable.</p> <p>Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.</p> <p>Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply:</p> <p>Delivery areas are not accessed through general parking areas and do not cross or share the following:</p> <p>a. Pedestrian and cyclist paths.</p> <p>b. Outside amenity areas accessible to building users and general public.</p> <p>There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.</p> <p>Parking and turning areas are designed for simple manoeuvring according to the type of</p> | Architect       | 1 | 0.72 | 0 | 0    | 0 | 0 | 0 | 0 | 1 | 0.72 | 0 | 0    | <p><b>Design Stage Evidence:</b></p> <p>Formal letter of commitment.</p> <p>Design drawings showing installed measures.</p> | Architect                                                                                                                                                                                                                                                                 |                                                                                                                                                                                 |     |  |
|       | Reduction of energy use and carbon emissions       | <p>Calculate an Energy Performance Ratio for New Construction (EPR NC). Compare the EPR NC achieved with the benchmarks in Table 6.1 and award the corresponding number of BREEAM credits.</p> <p>The methodology for the EPR NC calculation considers three metrics of modelled building performance when determining the number of credits achieved for this issue. The three metrics are:</p> <p>1. The building's heating and cooling energy demand</p> <p>2. The building's primary energy consumption</p> <p>3. The total resulting CO<sub>2</sub>-eq emissions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Energy Assessor | 9 | 0.66 | 7 | 4.62 | 0 | 0 | 0 | 0 | 0 | 0    | 7 | 4.62 | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>- As Designed BRUKL</p> <p><b>EVIDENCE PROVIDED:</b></p> <p>- As Designed BRUKL</p> | Energy Assessor                                                                                                                                                                                                                                                           |                                                                                                                                                                                 |     |  |
|       | Prediction of Operational Energy Consumption       | <p>Involve relevant members of the design team in an energy design workshop focusing on operational energy performance.</p> <p>Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures.</p> <p>Report predicted energy consumption targets by end use, design assumptions and input data (with justifications).</p> <p>Carry out a risk assessment to highlight any significant design, technical, and process risks that should be monitored and managed throughout the construction and commissioning process.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Design Team     | 4 | 0.66 | 4 | 2.64 | 0 | 0 | 0 | 0 | 0 | 0    | 0 | 0    | 0                                                                                                                           | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>Workshop Minutes</p> <p>Predicted energy consumption values, design assumptions, input data and risk assessments reported as detailed in the Energy Prediction and Post-occupancy guidance available from the BREEAM website.</p> | Energy Assessor                                                                                                                                                                 |     |  |
|       |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |   |      |   |      |   |   |   |   |   |      |   |      |                                                                                                                             |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                 |     |  |
| En 02 | Energy Monitoring                                  | <p>Sub-metering of major energy consuming systems</p> <p>Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems (see Methodology).</p> <p>The energy consuming systems in buildings with a total useful floor area greater than 1,000m<sup>2</sup> are metered using an appropriate energy monitoring and management system.</p> <p>The systems in smaller buildings are metered either with an energy monitoring and management system or with separate accessible energy sub-meters with pulsed or other open protocol communication outputs, to enable future connection to an energy monitoring and management system (see Relevant definitions).</p> <p>The end energy consuming uses are identifiable to the building users, for example through labelling or data outputs.</p>                                                                                                                                                                                                                                                                                                                              | M&E             | 1 | 0.66 | 1 | 0.66 | 0 | 0 | 0 | 0 | 0 | 0    | 0 | 1    | 0.66                                                                                                                        | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>- Commitment Letter</p> <p>- M&amp;E Specification.</p> <p>- M&amp;E Schematic Drawings.</p> <p><b>EVIDENCE PROVIDED:</b></p> <p>- Commitment Letter</p> <p>- Metering Strategy Report</p>                                        | COMPLETE FOR DESIGN STAGE                                                                                                                                                       |     |  |
| En 02 | Sub-metering of high energy load and tenancy areas | <p>An accessible energy monitoring and management system or separate accessible energy sub-meters with pulsed or other open protocol communication outputs to enable future connection to an energy monitoring and management system are provided, covering a significant majority of the energy supply to tenanted areas or, in the case of single occupancy buildings, relevant function areas or departments within the building/unit.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | M&E             | 1 | 0.66 | 1 | 0.66 | 0 | 0 | 0 | 0 | 0 | 0    | 0 | 1    | 0.66                                                                                                                        | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>- Commitment Letter</p> <p>- M&amp;E Specification.</p> <p>- M&amp;E Schematic Drawings</p> <p><b>EVIDENCE PROVIDED:</b></p> <p>- Commitment Letter</p> <p>- Metering Strategy Report</p>                                         | COMPLETE FOR DESIGN STAGE                                                                                                                                                       |     |  |
| En 03 | External lighting                                  | <p>External lighting</p> <p>The average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 luminaire lumens per circuit Watt.</p> <p>All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | M&E             | 1 | 0.66 | 1 | 0.66 | 0 | 0 | 0 | 0 | 0 | 0    | 0 | 0    | 0                                                                                                                           | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>- M&amp;E Specification</p> <p>- Proposed External Lighting Schedule</p> <p>- Proposed External Lighting Drawings</p>                                                                                                             | M&E                                                                                                                                                                             |     |  |
| En 04 | Low Carbon Design                                  | <p>A feasibility study has been carried out by the completion of the <b>Concept Design</b> stage by an energy specialist to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (L2C energy source(s)) for the building/development.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Energy Assessor | 1 | 0.66 | 1 | 0.66 | 0 | 0 | 0 | 0 | 0 | 0    | 0 | 0    | 0                                                                                                                           | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>- L2C Feasibility Study.</p>                                                                                                                                                                                                      | <p>Emailled CWC (31.03.22) to provide example L2C Feasibility Report and confirm if report has been produced to close out credit.</p> <p>Chased CWC for report (24.05.22).</p>  | M&E |  |
|       | Passive Design Analysis                            | <p>Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces.</p> <p>The project team analyses the proposed building design and development during <b>Concept Design</b> to identify opportunities for the implementation of passive design measures. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings.</p> <p>Quantify the reduced total energy demand and carbon dioxide (CO<sub>2</sub>-eq) emissions resulting from the passive design measures.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Energy Assessor | 1 | 0.66 | 1 | 0.66 | 0 | 0 | 0 | 0 | 0 | 0    | 0 | 0    | 0                                                                                                                           | <p><b>DESIGN STAGE EVIDENCE:</b></p> <p>- Passive Design Analysis</p>                                                                                                                                                                                                     | <p>Emailled CWC (31.03.22) to provide example Passive Design Analysis and confirm if report has been produced to close out credit.</p> <p>Chased CWC for report (24.05.22).</p> | M&E |  |



|        |                                                                                                                                                                                                      |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |      |      |      |      |   |   |      |      |      |      |   |                                                                                                                                                                                                                          |                                                                                                                                                 |                                                                                                                                                      |                     |     |  |
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| Wat 03 | Water Monitoring<br><b>Aim:</b> To ensure water consumption can be monitored and managed, and therefore encourage reductions.                                                                        | Water monitoring<br><b>MINIMUM STANDARD</b> | Specify a water meter on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source.<br><br>For water-consuming plant or building areas consuming 10% or more of the building's total water demand:<br><br>a. Fit easily accessible sub-meters OR<br>b. Install water monitoring equipment integral to the plant or area.<br><br>For each meter (main and sub):<br><br>a. Install a pulsed or other open protocol communication output AND<br>b. Connect it to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post Construction stage, award credits provided that the system used enables connection when the BMS becomes operational.<br><br>In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels.<br><br>In buildings containing laboratories, fit a separate water meter on the water supply to any process or cooling loop for 'plumbed-in' laboratory process equipment, irrespective of their water consumption levels. | M&E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1       | 0.77 | 1    | 0.77 | 0    | 0 | 0 | 0.77 | 0    | 0    | 0    | 0 | <b>DESIGN STAGE EVIDENCE:</b><br>- Proposed Water metering schematic and compliant BMS Specification<br>- Manufacturer product information / M&E Specification                                                           |                                                                                                                                                 | M&E                                                                                                                                                  |                     |     |  |
|        |                                                                                                                                                                                                      |                                             | Water Leak Detection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | A leak detection system capable of detecting leaks BOTH within the building AND between the building and the site boundary, will be installed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | M&E     | 1    | 0.77 | 1    | 0.77 | 0 | 0 | 0    | 0    | 0.77 | 0    | 0 | 0                                                                                                                                                                                                                        | 0                                                                                                                                               | <b>DESIGN STAGE EVIDENCE:</b><br>- Proposed water metering schematic and compliant BMS Specification<br>- Product information<br>- M&E Specification |                     | M&E |  |
|        |                                                                                                                                                                                                      |                                             | Flow Control Devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Flow control devices that regulate the supply of water to each WC area/facility according to demand are installed (and therefore minimise water leaks and wastage from sanitary fittings). The following could be considered as types of flow control devices:<br>- A presence detector and controller, i.e. an automatic device detecting occupancy or movement in an area to switch water on and turn it off when the presence is removed<br>A central control unit, i.e. a dedicated computer based control unit for an overall managed water control system, utilising some or all of the types of control elements listed above. | M&E     | 1    | 0.77 | 1    | 0.77 | 0 | 0 | 0    | 0    | 0.77 | 0    | 0 | 0                                                                                                                                                                                                                        | 0                                                                                                                                               | <b>DESIGN STAGE EVIDENCE:</b><br>- Proposed water metering schematic<br>- M&E Specification                                                          |                     | M&E |  |
| Mat 03 | Life Cycle Impacts<br><b>Aim:</b> To recognise and encourage the use of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building. | Life Cycle Impact                           | During the <b>Concept Design</b> , demonstrate the environmental performance of the building as follows:<br><br>a. Carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology<br>b. Submit the Mat 01/02 Results Submission Tool to BRE at the end of <b>Concept Design</b> , and before planning permission is applied for (that includes external material or product specifications).<br><br>During <b>Technical Design</b> , demonstrate the environmental performance of the building as follows:<br><br>a. Carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology<br>b. Submit the Mat 01/02 Results Submission Tool to BRE at the end of <b>Technical Design</b> .                                                                                                                                                                                                                                                                                                                                                                                                                     | Life Cycle Assessor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 7       | 1.25 | 5    | 6.25 | 0    | 0 | 0 | 0    | 6.25 | 1    | 1.25 | 4 | 5                                                                                                                                                                                                                        | <b>DESIGN STAGE EVIDENCE:</b><br>- IMPACT Compliant Life Cycle Assessment Report<br><br><b>EVIDENCE PROVIDED:</b><br>- Concept Design Stage LCA | 4 credits awarded for Concept Design Stage LCA.<br>Additional credits available for updated Technical Design Stage LCA - tbc.                        | Life Cycle Assessor |     |  |
|        |                                                                                                                                                                                                      |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |      |      |      |      |   |   |      |      |      |      |   |                                                                                                                                                                                                                          |                                                                                                                                                 |                                                                                                                                                      |                     |     |  |
| Mat 02 | Environmental Product Declarations<br><b>Aim:</b> To recognise availability of robust and comparable data on the impacts of construction products through the provision of EPD.                      | Environmental Product Declarations          | Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the Methodology in the BREEAM Technical Manual.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Architect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1       | 1.25 | 0    | 0    | 0    | 0 | 0 | 0    | 0    | 1    | 1.25 | 0 | 0                                                                                                                                                                                                                        | <b>DESIGN STAGE EVIDENCE:</b><br>- Mat 01/02 Results Submission Tool<br>- Copies of EPD Certificates                                            |                                                                                                                                                      | Architect           |     |  |
| Mat 03 | Responsible sourcing of materials<br><b>Aim:</b> To recognise and encourage the specification and procurement of responsibly sourced materials for key building elements.                            | Pre-requisite Timber Procurement            | All timber used on site will be sourced in accordance with the UK Government's Timber Procurement Policy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Main Contractor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Pre-req |      |      |      |      |   |   |      |      |      |      |   | <b>DESIGN STAGE EVIDENCE:</b><br>- Timber Procurement Materials Policy<br>- Written commitment confirming all timber will be legally harvested and trade timber.<br><br><b>EVIDENCE PROVIDED:</b><br>- Commitment Letter | COMPLETE AT DESIGN STAGE                                                                                                                        | Architect                                                                                                                                            |                     |     |  |
|        |                                                                                                                                                                                                      | Sustainable Procurement Plan                | A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must:<br><br>a. Be in place before <b>Concept Design</b><br>b. Include sustainability aims, objectives and strategic targets to guide procurement activities. Note: targets do not need to be achieved for the credit to be awarded but justification must be provided for targets that are not achieved.<br>c. Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible.<br>d. Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Main Contractor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1       | 1.25 | 1    | 1.25 | 0    | 0 | 0 | 0    | 1.25 | 0    | 0    | 0 | 0                                                                                                                                                                                                                        | <b>DESIGN STAGE EVIDENCE:</b><br>- Sustainable Procurement Plan<br>- Letter of commitment                                                       |                                                                                                                                                      | Main Contractor     |     |  |

|    |        |                                                                                                                                                                                                                                            |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |   |      |   |      |   |   |   |   |      |   |      |     |   |                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                 |  |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|------|---|------|---|---|---|---|------|---|------|-----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|
|    |        | Major Building Elements                                                                                                                                                                                                                    | Key building materials are responsibly sourced to reduce environmental and socio-economic impacts. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Architect       | 3 | 1.25 | 2 | 2.5  | 0 | 0 | 0 | 0 | 2.5  | 1 | 1.25 | 0   | 0 | DESIGN STAGE EVIDENCE:<br>Completed Mat 3 template.<br>Certificates from suppliers.                                                                                               |                                                                                                                                                                                                                                                                                            | Architect                                                                                                                                                                                                         |                 |  |
| 47 | Mat 05 | Designing for durability and resilience<br>Aim: To recognise and encourage adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximising materials optimisation. | Designing for Robustness                                                                           | <p><b>Protecting vulnerable parts of the building from damage</b> -The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external building and landscaping elements. This must include, but is not necessarily limited to:</p> <p>a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.).</p> <p>b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.</p> <p>c. Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building facade for all car parking areas and within 2m for all delivery areas.</p> <p><b>Material Degradation</b> - Environmental factors have been identified that are relevant to the site location<br/>Existing applicable building elements that are exposed to any relevant environmental factors have been identified.<br/>Existing applicable building elements have been surveyed have been assessed to identify impacts of material degradation effects including an assessment to grade the severity of any degradation effects. Design and specification measures have been developed to repair and protect existing elements according to the severity of any degradation affects, to limit degradation. Where it is not feasible to implement measures to limit material degradation for existing elements, justification should be provided.<br/>Newly specified materials or newly constructed elements (e.g. a new external wall) within the scope of refurbishment or fit-out works incorporate appropriate design and specification measures to limit material degradation due to environmental factors.</p> | Architect       | 1 | 1.25 | 1 | 1.25 | 0 | 0 | 0 | 0 | 1.25 | 0 | 0    | 0   | 0 | DESIGN STAGE EVIDENCE:<br>Completed Mat 3 template<br>Mat 05 Letter of commitment<br>Proposed Drawings                                                                            |                                                                                                                                                                                                                                                                                            | Architect                                                                                                                                                                                                         |                 |  |
| 48 | Mat 06 | Material efficiency<br>Aim: To recognise and encourage measures to optimise material efficiency in order to minimise environmental impact of material use and waste.                                                                       | Material efficiency                                                                                | <p>1) Opportunities have been identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life .</p> <p>2) The above is carried out by the design/construction team in consultation with the relevant parties at each of the following RIBA stages:</p> <p><b>a. Preparation and Brief</b><br/><b>b. Concept Design</b><br/><b>c. Developed Design</b><br/><b>d. Technical Design</b><br/><b>e. Construction.</b></p> <p>RELEVANT PARTIES: Client/developer, Cost consultant, Architect, Structural/civil engineers, Building services engineers, Principal contractor, Demolition/strip-out contractor, Environmental consultant, Project management consultant, Materials/component manufacturers/suppliers.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Architect       | 1 | 1.25 | 1 | 1.25 | 0 | 0 | 0 | 0 | 1.25 | 0 | 0    | 0   | 0 | DESIGN STAGE EVIDENCE:<br>Mat 6 Table Complete<br>Commitment<br>Meeting Minutes<br>Stage Reports<br><br>EVIDENCE PROVIDED:<br>Mat 06 Report                                       | Emailled architect (31.03.22) to provide example report.<br><br>Mat 06 report provided demonstrating compliance during Concept Design. Report needs to be updated during Developed Design, Technical Design and Construction phases.<br>Emailled architect (20.04.22) confirming the same. | Architect                                                                                                                                                                                                         |                 |  |
| 49 | Wst 01 | Construction Waste Management<br>Aim: To promote resource efficiency via the effective management and reduction of construction waste.                                                                                                     | Pre-Demolition Audit                                                                               | <p><b>CREDIT NOT APPLICABLE</b></p> <p>The client shall ensure that a pre-demolition audit of all existing buildings, structures or hard surfaces within the scope of the refurbishment or fit-out zone is completed.<br/>The requirements for carrying out an appropriate pre-refurbishment audit are</p> <p>a. The audit should be carried out at the Concept Design Stage (equivalent to RIBA stage 2) prior to strip-out or demolition works in order to use the audit results to guide the design, consideration of materials that can be reused, and to set targets for waste management and ensure all contractors are engaged in the process of maximising high grade reuse and recycling opportunities.</p> <p>b. The audit should be carried out by a competent person (see Relevant Definitions) who is independent of the project, has appropriate knowledge of buildings, waste and options for the reuse and recycling of different waste streams</p> <p>c. Actual waste arising and waste management routes used should be compared with those forecast from the audit and barriers to achieving targets should be investigated.<br/>The audit must be referenced in the resource management plan and cover:</p> <p>d. Identification and quantification of the key materials where present on the project</p> <p>e. Potential applications and any related issues for the reuse and recycling of the key materials in accordance with the waste hierarchy.</p> <p>f. Identification of local re-processors or recyclers for recycling of materials</p> <p>g. Identification of overall recycling rate for all key materials</p> <p>h. Identification of reuse targets where appropriate.</p> <p>i. Identification of overall landfill diversion rate for all key materials.</p>                                                                                                                                                              | Main Contractor | 0 | 0.00 | 0 | 0    | 0 | 0 | 0 | 0 | 0    | 0 | 0    | 0   | 0 |                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                   |                 |  |
| 51 | Wst 01 | Construction Resource Efficiency                                                                                                                                                                                                           | Construction Resource Efficiency                                                                   | <p>Targets will be set within the Site Waste Management Plan, and procedures put in place, to ensure that the following waste benchmarks are achieved:</p> <p>- 1 credit - 13.3m³ / 11.1 tonnes per 100m²</p> <p>- 2 credits - 7.5m³ / 6.3 tonnes per 100m²</p> <p>- 3 credits - 3.4m³ / 3.2 tonnes per 100m²</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Main Contractor | 3 | 0.70 | 2 | 1.4  | 0 | 0 | 0 | 0 | 1.4  | 1 | 0.7  | 0   | 0 | DESIGN STAGE EVIDENCE:<br>- Tender Specification and/or Site Waste Management Procedures<br>- SWMP - referring to BREEM targets.<br><br>EVIDENCE PROVIDED:<br>- Commitment Letter | Element sent Letter of Commitment to Charlie Entwistle to sign and return (31.03.22).<br><br>In order to close out credit, resource management plan is required. (27.04.22)                                                                                                                | Main Contractor                                                                                                                                                                                                   |                 |  |
| 52 | Wst 01 | Diversion of Waste from Landfill                                                                                                                                                                                                           | Diversion of Waste from Landfill                                                                   | <p>Targets and procedures will be put in place to ensure that over 70% by volume / 80% by weight of construction waste, and 80% by volume / 90% by weight of demolition waste, generated is diverted from landfill and that materials will be sorted into key waste groups.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Main Contractor | 1 | 0.70 | 1 | 0.7  | 0 | 0 | 0 | 0 | 0.7  | 0 | 0    | 0   | 0 | DESIGN STAGE EVIDENCE:<br>-Tender Specification and/or Site Waste Management Procedures<br>SWMP - referring to BREEM targets.<br><br>EVIDENCE PROVIDED:<br>-Commitment Letter     | Element sent Letter of Commitment to Charlie Entwistle to sign and return (31.03.22).<br><br>In order to close out credit, resource management plan is required. (27.04.22)                                                                                                                | Main Contractor                                                                                                                                                                                                   |                 |  |
| 53 | Wst 02 | Recycled aggregates<br>Aim: To recognise and encourage the use of recycled and secondary aggregates, thereby reducing the demand for virgin material and optimising material efficiency in construction.                                   | Recycled aggregates                                                                                | <p>- Identify all aggregate uses and types on the project.</p> <p>- Determine the quantity in tonnes for each identified use and aggregate type.</p> <p>- Identify the region in which the aggregate source is located.</p> <p>- Calculate the distance in kilometres travelled by all aggregates by transport type</p> <p>Enter the information into the BREEM Wst 02 calculator to calculate the Project Sustainable Aggregate points.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Main Contractor | 1 | 0.70 | 0 | 0    | 0 | 0 | 0 | 0 | 0    | 0 | 0    | 0.7 | 0 | 0                                                                                                                                                                                 | EVIDENCE:<br>-Schedule of aggregates.<br>-Quantity Calculations.<br>-Kilometres Travelled.<br><br>EVIDENCE PROVIDED:<br>- Commitment Letter                                                                                                                                                | Element sent Letter of Commitment to Charlie Entwistle to sign and return (31.03.22).<br><br>To close out credit, a copy of the completed wst 02 calculator is required, plus any supporting documents (27.04.22) | Main Contractor |  |

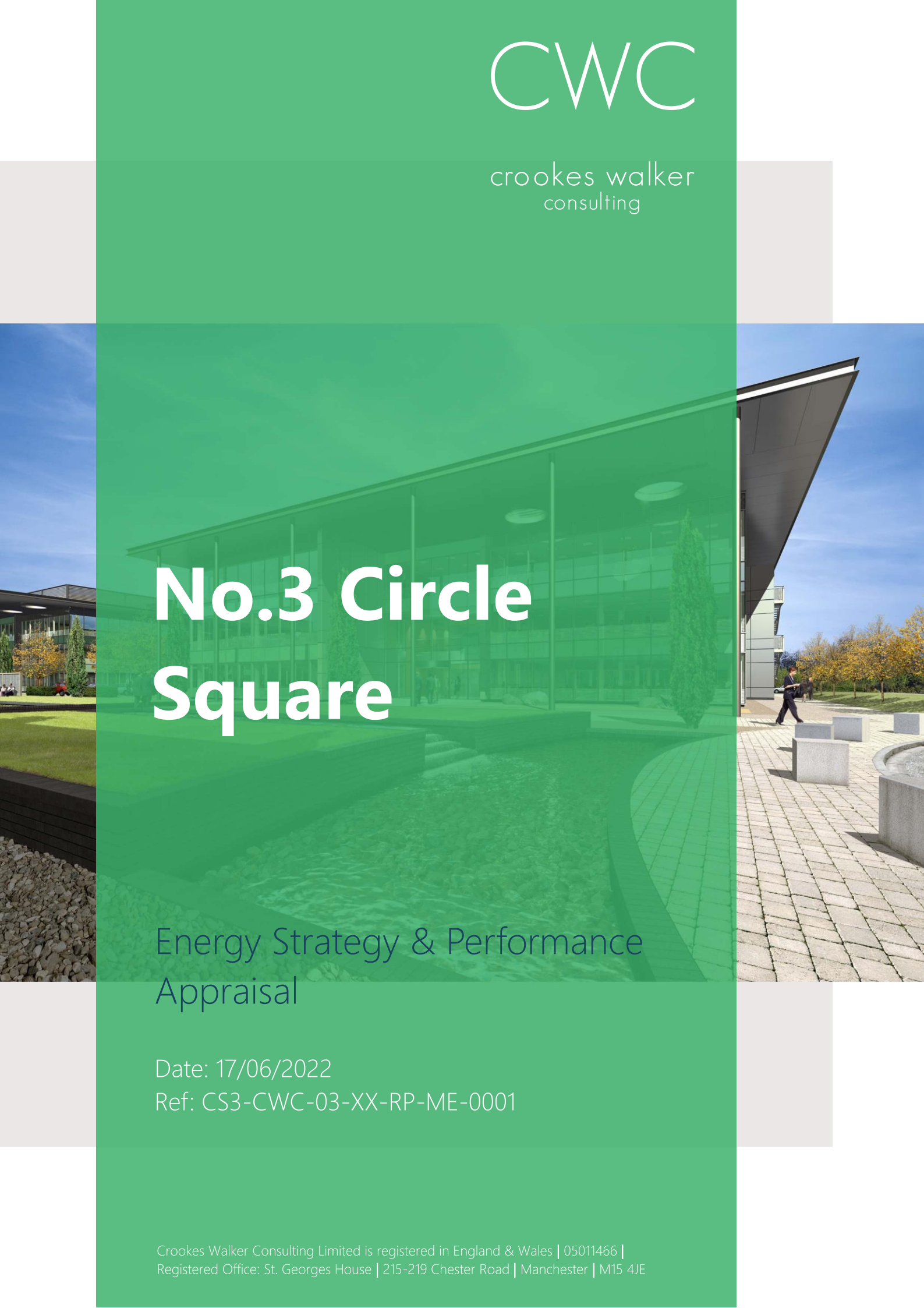
|        |                                                                                                                                                                                                                                                              |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |   |      |   |      |   |   |   |   |      |   |   |   |     |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                 |           |  |
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| Wet 03 | <b>Operational waste</b><br><b>Aim:</b> To recognise and encourage the provision of dedicated storage facilities for a building's operational-related recyclable waste streams, so that this waste is diverted from landfill or incineration                 | Recyclable Waste Storage (Minimum Standard) | Dedicated space(s) is provided for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities. This space must be:<br><br>a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams.<br>b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors<br>c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates.                                                                                                                                                                                                                                                                                                               | Architect | 1 | 0.70 | 1 | 0.7  | 0 | 0 | 0 | 0 | 0.7  | 0 | 0 | 0 | 0   | <b>DESIGN STAGE EVIDENCE:</b><br>- Proposed Site Plan drawing showing facilities to be provided.<br>- Waste Management Strategy.                                          |                                                                                                                                                                                                                                                                                                                                                                 | Architect |  |
| Wet 04 | <b>Speculative floor and ceiling finishes</b><br><b>Aim:</b> To encourage the specification and fitting of floor and ceiling finishes selected by the building occupant and therefore avoid unnecessary waste of materials.                                  | Speculative Floor and Ceiling Finishes      | In a building being refurbished or fitted out for a specific occupant, that occupant has selected (or agreed to) the specified interior finishes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Architect | 1 | 0.70 | 1 | 0.7  | 0 | 0 | 0 | 0 | 0.7  | 0 | 0 | 0 | 0   | <b>Design Stage Evidence:</b><br>Design drawings demonstrating floor and ceiling finishes<br>Letter of Commitment                                                         |                                                                                                                                                                                                                                                                                                                                                                 | Architect |  |
| Wet 05 | <b>Adaptation to climate change</b><br><b>Aim:</b> To recognise and encourage measures taken to mitigate the impact of extreme weather conditions arising from climate change over the lifespan of the building.                                             | Adaptation to Climate Change                | Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of Concept Design (RIBA Stage 2 or equivalent), in accordance with the following approach:<br><br>Carry out a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages:<br><br>i. Hazard identification<br>ii. Hazard assessment<br>iii. Risk estimation<br>iv. Risk evaluation<br>v. Risk management.                                                                                                                                                                                                                                                                                             | Architect | 1 | 0.70 | 1 | 0.7  | 0 | 0 | 0 | 0 | 0.7  | 0 | 0 | 0 | 0   | <b>DESIGN STAGE EVIDENCE:</b><br>Complete proposed Wet 5 template report<br>-Proposed Drawings<br>-Specification(s)<br><br><b>EVIDENCE PROVIDED:</b><br>- Risk assessment | Emailed architect (31.03.22) to provide example report.<br><br>Wet 05 risk assessment provided demonstrating compliance with Concept Design requirements. To close out credit at Design Stage, need additional evidence providing an update of recommendations/solutions implemented during Technical Design. Emailed architect (20.04.22) confirming the same. | Architect |  |
| Wet 06 | <b>Functional adaptability</b><br><b>Aim:</b> To recognise and encourage measures taken to accommodate future changes of use of the building over its lifespan.                                                                                              | Functional Adaptability                     | A building-specific functional adaptation strategy study has been undertaken by the client and design team by <b>Concept Design</b> (RIBA Stage 2 or equivalent), which includes recommendations for measures to be incorporated to facilitate future adaptation.<br><br>Provide an update, during <b>Technical Design</b> , on:<br><br>a. How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor.<br>b. Changes to the recommendations and solutions during the development of the Technical Design.<br><br>Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.                                                                                                                                                                           | Architect | 2 | 0.70 | 2 | 1.4  | 0 | 0 | 0 | 0 | 1.4  | 0 | 0 | 1 | 0.7 | <b>DESIGN STAGE EVIDENCE:</b><br>- Functional Adaptability Study<br>- Drawings<br>- Specification(s)<br><br><b>EVIDENCE PROVIDED:</b><br>- Recommendations report         | Emailed architect (31.03.22) to provide example report.<br><br>Design for disassembly and functional adaptability recommendations report provided. One credit awarded in respect of the same.<br><br>Disassembly and functional adaptability implementation report required to close out second credit. Emailed architect (20.04.22) confirming the same.       | Architect |  |
| Le 01  | <b>Site Selection</b><br><b>Aim:</b> To encourage the use of previously occupied or contaminated land and avoid land which has not been previously disturbed.                                                                                                | Site Selection                              | Proposed development on a pre-developed site - At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Architect | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0 | 0 | 0   | <b>DESIGN STAGE EVIDENCE:</b><br>- Drawings                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                 | Architect |  |
| Le 02  | <b>Ecological Risks and Opportunities</b><br><b>Aim:</b> To determine the existing ecological value associated with the site, including surrounding areas, and the risks and opportunities for ecological protection and enhancement as part of the project. | Survey and Evaluation                       | A Suitably Qualified Ecologist (SQE) carries out a survey and evaluation for the site early enough to influence site preparation works, layout and, where necessary, strategic planning decisions (typically Preparation and Brief or <b>Concept Design</b> stage).<br><br>The SQE's survey and evaluation determines the site's ecological baseline, including:<br><br>a. Current and potential ecological value and condition of the site and related areas within the Zone of Influence.<br>b. Direct and indirect risks to current ecological value from the project.<br>c. Capacity and feasibility for enhancement of the site's ecological value and, where relevant, areas within the Zone of Influence.<br><br>Recommendations and data collected from the survey and evaluation are shared with appropriate project team members to influence decisions made for activities during site preparation, design and construction works, which can support ecological features. | Ecologist | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0 | 0 | 0   | <b>DESIGN STAGE EVIDENCE:</b><br>- Ecologists Report<br>- Completed GN13 Document                                                                                         | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22).                                                                                                                                                                                                                                               | Ecologist |  |
|        |                                                                                                                                                                                                                                                              | Determining Ecological Outcomes             | Achieve the "Survey and Evaluation" credit.<br><br>The project team liaise and collaborate with representative stakeholders early enough to influence key planning decisions (typically Concept Design stage), to:<br><br>a. Identify the optimal ecological outcomes for the site.<br>b. Identify, appraise and select measures to meet the optimal ecological outcomes for the site, in line with the mitigation hierarchy of action:<br><br>1. Avoidance<br>2. Protection<br>3. Reduction or limitation of negative impacts<br>4. On site compensation and<br>5. Enhancement, considering the capacity and feasibility within the site, or where viable, offsite.                                                                                                                                                                                                                                                                                                                 | Ecologist | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0 | 0 | 0   | <b>DESIGN STAGE EVIDENCE:</b><br>- Ecologists Report<br>- Completed GN13 Document                                                                                         | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.                                                                                                                                                                                                                                                                                           | Ecologist |  |

|       |                                                                                                                                                                                                                                       |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |   |      |   |      |   |   |   |   |      |   |      |   |   |                                                                                                                                                                                                                      |                                                                                                                   |           |  |
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| Le 03 | Managing Impacts on Ecology<br><b>Aim:</b> To avoid, or limit as far as possible, negative ecological impacts associated with the site and surrounding areas resulting from the project                                               | Planning and Measures on Site                     | Further planning to avoid and manage negative ecological impacts on-site is carried out early enough to influence the concept design and design brief as well as site preparation planning (typically Concept Design stage).<br><br>On-site measures for managing negative ecological impacts during site preparation and construction are implemented in practice (e.g. mitigation measures to protect existing ecological features).<br><br>Measures are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE02 Ecological risks and opportunities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Ecologist | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Ecologists Report<br>Completed GN13 Document                                                                                                                                               | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22). | Ecologist |  |
|       |                                                                                                                                                                                                                                       | Managing Negative Impacts                         | Negative impacts from site preparation and construction works have been managed according to the mitigation hierarchy, in line with the SQE's recommendations and, either:<br><br>a. No overall loss of ecological value has occurred (two credits).<br>b. The loss of ecological value has been minimised (Minimising Loss) (one credit).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Ecologist | 2 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Ecologists Report<br>Completed GN13 Document                                                                                                                                               | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22). | Ecologist |  |
| Le 04 | Ecological Change and Enhancement<br><b>Aim:</b> To enhance ecological value of the area associated with the site in support of local, regional and national priorities                                                               | Ecological Enhancement                            | Measures have been implemented that enhance ecological value, which are based on input from the project team and SQE in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in Le 02. Measures are implemented in the following order:<br><br>a. On site, and where this is not feasible,<br>b. Off site within the Zone of Influence.<br><br>Data collated are analysed and where potentially valuable, provided to the local environmental records centres nearest to, or relevant for, the site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Ecologist | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Ecologists Report<br>Completed GN13 Document                                                                                                                                               | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22). | Ecologist |  |
|       |                                                                                                                                                                                                                                       | Change and Enhancement of Ecology                 | Up to three credits are awarded based on the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 - BREEM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. Credits are awarded in line with the Reward Scale table in GN36 where there are no residual impacts on protected sites or irreplaceable habitats.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Ecologist | 3 | 1.15 | 2 | 2.3  | 0 | 0 | 0 | 0 | 2.3  | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Ecologists Report<br>Completed GN13 Document                                                                                                                                               | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22). | Ecologist |  |
| Le 05 | Long Term Ecology Management and Maintenance<br><b>Aim:</b> To secure ongoing monitoring, management and maintenance of the site and its habitats and ecological features to ensure intended outcomes are realised for the long term. | Management and Maintenance Throughout the Project | Measures have been implemented to manage and maintain ecology throughout the project. These measures are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in Le 02. To ensure the optimal ecological outcomes agreed in Le 02 are met in practice, these measures must monitor and review the effectiveness of the mitigation and enhancement measures in place for Le 03 & Le 04 to ensure they are implemented.<br><br>A section on Ecology and Biodiversity has been included as part of the tenant or building owner information supplied, to inform the owner or occupant of local ecological features, value and biodiversity on or near the site. This should include detailed management and maintenance plans as required by landscape and asset managers as well as relevant parts of the handover information for occupiers written in a format that encourages understanding and supportive behaviours.                                                                                                                  | Ecologist | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Ecologists Report<br>Completed GN13 Document                                                                                                                                               | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22). | Ecologist |  |
|       |                                                                                                                                                                                                                                       | Landscape and Ecology Management Plan             | A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS 42020:2013 Section 11.1(213) covering at least the first five years after project completion as a minimum and including:<br><br>a. Actions and responsibilities of relevant individuals prior to handover<br>Technical Manual: Version: S05078 - Issue: 3.0 - Issue Date: 31/07/2019<br>Page 319 of 392 LE 05 Long term ecological management and maintenance BREEM UK New Construction 2018<br>b. The ecological value and condition of the site at handover and how this is expected to develop and change over time<br>c. Identification of opportunities for ongoing alignment with activities beyond the development project, which support the aims of BREEM's Strategic Ecology Framework.<br>d. Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts<br>e. Clearly defined and allocated roles and responsibilities for delivering the plan.<br><br>The landscape and management plan or similar will be updated to support maintenance of the ecological value of the site. | Ecologist | 1 | 1.15 | 1 | 1.15 | 0 | 0 | 0 | 0 | 1.15 | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Ecologists Report<br>Completed GN13 Document                                                                                                                                               | Emailed PM (31.03.22) to confirm if Ecology Report has been prepared.<br><br>ES chased Ecology Report (24.05.22). | Ecologist |  |
| 80    | Pol 02<br>Impact of refrigerants<br><b>Aim:</b> To reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems                                                                        | Impact of Refrigerants                            | <u>Two Credits</u><br>The direct effect life cycle CO <sub>2</sub> equivalent emissions (DELC) of ≤100 CO <sub>2</sub> -eq/KW. For systems which provide cooling and heating, the worst performing output based on the lower of KW cooling output and KW heating output is used to complete the calculation.<br><br>OR<br><br>All refrigerants used have a global warming potential (GWP) ≤10.<br><br><u>One Credit</u><br>Systems using refrigerants have a DELC of ≤1000kgCO <sub>2</sub> -eq/KW cooling and heating capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | M&E       | 2 | 0.75 | 1 | 0.75 | 0 | 0 | 0 | 0 | 0.75 | 1 | 0.75 | 0 | 0 | DESIGN STAGE EVIDENCE:<br>M&E Specification / Confirmation Letter.<br>Proposed Equipment Schedule (Heating and Cooling)<br>Proposed Drawings<br>Manufacturers Datasheets<br>Pol 01 Calculation Tool (BREEM Assessor) |                                                                                                                   | M&E       |  |
| 81    | Pol 01<br>Leak Detection                                                                                                                                                                                                              | Leak Detection                                    | Where systems using refrigerants have a permanent automated refrigerant leak detection system installed; OR where an inbuilt automated diagnostic procedure for detecting leakage is installed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | M&E       | 1 | 0.75 | 1 | 0.75 | 0 | 0 | 0 | 0 | 0.75 | 0 | 0    | 0 | 0 | DESIGN STAGE EVIDENCE:<br>M&E Specification / Confirmation Letter.<br>Proposed equipment schedule (heating and cooling).<br>Proposed drawings.<br>Manufacturers datasheets.<br>Pol 01 calculation tool.              |                                                                                                                   | M&E       |  |

|    |        |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |   |      |   |      |   |   |   |   |      |   |   |   |   |                                                                                                                                                                                                        |                       |  |
|----|--------|----------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---|------|---|------|---|---|---|---|------|---|---|---|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--|
| 63 | Pol 03 | Local Air Quality                | Local Air Quality                | <p>All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity.</p> <p>OR alternatively:</p> <p>All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity. OR alternatively: Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels as follows:</p> <p>Gas boiler = NOx 24 mg/kWh.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | M&E                   | 2 | 0.75 | 2 | 1.5  | 0 | 0 | 0 | 0 | 1.5  | 0 | 0 | 0 | 0 | DESIGN STAGE EVIDENCE:<br>M&E Specification / or written confirmation (letter/email)<br>Proposed Equipment Schedule (Heating and Cooling)<br>Proposed Drawings<br>Boiler Specification (if applicable) | M&E                   |  |
| 63 | Pol 03 | Surface water run-off            | Flood Risk                       | <p><u>Low Flood Risk – 2 Credits</u></p> <p>A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration.</p> <p><u>Medium or High Flood Risk – 1 Credit</u></p> <p>A site-specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. The FRA must take all current and future sources of flooding into consideration. For smaller sites refer to Level of detail required in the FRA for smaller sites on page 340, which overrides criterion 2 above.</p> <p>To increase the resilience and resistance of the development to flooding, one of the following must be achieved:</p> <p>a. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone (see 600mm threshold on page 340).</p> <p>b. The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS8533:2017 (222).</p>                                                                                                                                            | Flood Risk Specialist | 2 | 0.75 | 1 | 0.75 | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0 | 0 | DESIGN STAGE EVIDENCE:<br>Flood Risk Assessment                                                                                                                                                        | Flood Risk Specialist |  |
| 64 | Pol 03 | Surface Water Run-Off - Rate     | Surface Water Run-Off - Rate     | <p>For brownfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the predeveloped site. This should comply at the 1-year and 100-year return period events.</p> <p>For Greenfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1-year and 100-year return period events.</p> <p>Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place.</p> <p>Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Drainge Consultant    | 1 | 0.75 | 1 | 0.75 | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0 | 0 | DESIGN STAGE EVIDENCE:<br>CV for Civil Engineer / Drainage Consultant<br>Relating drainage to BREEM Checklist complete<br>Proposed drainage drawings<br>Drainage Strategy Report                       | Drainge Consultant    |  |
| 65 | Pol 03 | Surface Water Run-Off - Volume   | Surface Water Run-Off - Volume   | <p>Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); AND</p> <p>EITHER</p> <p>Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change.</p> <p>Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques.</p> <p>OR</p> <p>Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options.</p> <p>Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flowrate from the following options:</p> <p>a. The pre-development one-year peak flowrate</p> <p>b. The mean annual flowrate (Qbar)</p> <p>c. 2L/s/ha.</p>                                                                                                                                                                                                                                                                                         | Drainge Consultant    | 1 | 0.75 | 1 | 0.75 | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0 | 0 | DESIGN STAGE EVIDENCE:<br>CV for Civil Engineer / Drainage Consultant<br>Relating drainage to BREEM Checklist complete<br>Proposed drainage drawings<br>Drainage Strategy Report                       | Drainge Consultant    |  |
| 66 | Pol 03 | Minimising watercourse pollution | Minimising watercourse pollution | <p>There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant).</p> <p>Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.</p> <p>Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems.</p> <p>Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure.</p> <p>All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual</p> <p>and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site.</p> <p>A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers.</p> <p>Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.</p> <p>All external storage and delivery areas are designed and detailed in accordance with the</p> | Drainge Consultant    | 1 | 0.75 | 0 | 0    | 0 | 0 | 0 | 0 | 0    | 0 | 0 | 0 | 0 | EVIDENCE:<br>CV for Civil Engineer<br>Drainage Strategy Report<br>Flood Risk Assessment<br>Email Confirmation                                                                                          | Drainge Consultant    |  |



APPENDIX B – ENERGY PERFORMANCE AND PERFORMANCE APPRAISAL

The background of the cover is a photograph of a modern, multi-story glass building. A semi-transparent green rectangular overlay covers the majority of the image, serving as a backdrop for the text. The building's glass facade reflects the sky and surrounding environment. In the foreground, there is a paved plaza with some low concrete walls and a small, curved water feature. A few people can be seen walking in the distance. The sky is blue with some light clouds.

CWC

crookes walker  
consulting

# No.3 Circle Square

## Energy Strategy & Performance Appraisal

Date: 17/06/2022

Ref: CS3-CWC-03-XX-RP-ME-0001

## Revision Record

| Date       | Reference                | Revision | Prepared By    | Checked By        | Authorised By  |
|------------|--------------------------|----------|----------------|-------------------|----------------|
| 17/06/2022 | CS3-CWC-03-XX-RP-ME-0001 | T01      | George Talbot  | Laura Whatmough   | George Talbot  |
|            |                          |          | <i>gtalbot</i> | <i>lwhatmough</i> | <i>gtalbot</i> |

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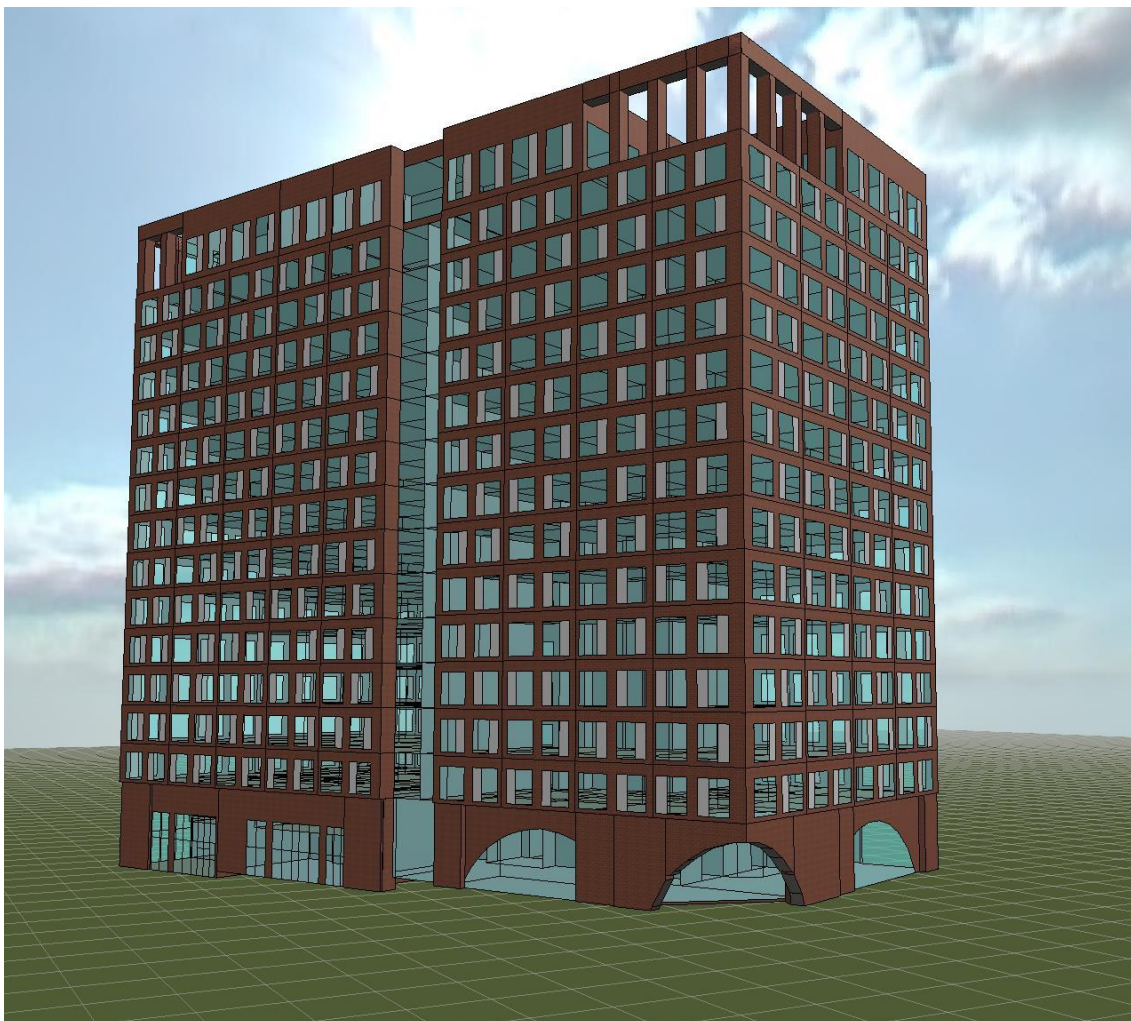
## 1.0 Executive Summary

The Energy Performance Appraisal was undertaken to evaluate the buildings performance against the client targets, including a minimum NABERS 5-star rating and eventual compliance with the UKGBC framework 2050 "Paris Proof Target". Achieving these targets will help to ensure that the building achieves operational net zero carbon emissions.

In its current form and with the proposed systems and installations, the Base Building's energy consumption suggests that a NABERS 5.5-star rating and the 2025-2030 UKGBC interim targets are achievable. The Bruntwood minimum requirement of 90kWh/m<sup>2</sup>/yr (GIA) is satisfied with most of the modelled scenarios.

An EPC rating of A is achievable for all zones of the building based on the current inputs.

On-site generation, based on 620m<sup>2</sup> of PV installed at roof level, is estimated to produce 88,576kWh of electricity annually. This equates to under 3% of the buildings predicted annual energy consumption, or less than 1 floor of the building. This does not meet the Bruntwood target for on-site PV generation.



## 2.0 Introduction

Crookes Walker Consulting (CWC) have produced this report to demonstrate compliance with the following sustainability targets as set out in the Bruntwood brief and as discussed through the design process to date:

- UKGBC 2050 compliant / Operational Net Zero Carbon
- NABERS 5-star rating
- NABERS 6-star rating feasibility
- EPC A
- Maximum predicted energy intensity of 90kWh/m<sup>2</sup>(GIA)/yr or less and a DEC rating of C65
- Target energy intensity of 55kWh/m<sup>2</sup>(GIA)/yr or less and a DEC rating of B40
- On site generation to provide (as a target) either 20% of a building's predicted energy use or equivalent of two floors of a building's energy use

This report will summarise each of the above criteria and demonstrate how the proposed development can achieve each target.

### Modelling Limitations

This assessment is based on computer simulations using a number of assumptions to estimate a range of performance for a variety of potential scenarios. The actual building performance in use will be dependent on a number of variables including occupancy usage and external weather conditions, which can be only estimated at this stage and will vary in practice. Computer simulation provides an estimate of performance. This estimate is based on simplifications that do not and cannot fully represent all of the intricacies of performance once built. As a result, simulation results only represent an interpretation of the potential performance. No guarantee or warranty of performance in practice can be based on simulation results alone.

## 3.0 Energy Strategy/Methodology

The English Building Regulations Part L2A 2013 are made up of five criteria in total, with the first 3 to be completed during design stage. Criterion 1 and 2 must be achieved in order to attain compliance at this design stage, with Criterion 3 being guidance only.

In order to achieve the above requirements, a methodology is to be followed as the design progresses, which includes:

- The consideration and incorporation of passive design solutions, where feasible
- The incorporation of energy efficiency measures through the design of services and improved fabric performance
- Calculation of the predicted design energy consumption rates and associated annual CO<sub>2</sub> emissions for the development in comparison with the Building Regulations
- Assessment of the viability of incorporating low and zero carbon energy sources

The following bullet points outline the proposed design solutions for the proposed development that will respond to the energy requirements of the Greater Manchester Authority and the Manchester City Council requirement. An Energy and Sustainability Strategy will be created which will expand on the following proposed details for the development:

- Thermal insulation levels for all building elements to be enhanced beyond minimum Building Regulation standards, thereby substantially reducing the building's heat losses through conduction.
- Air tightness will be prioritised with optimised levels of permeability preventing heat loss and gain via uncontrolled infiltration.
- Good solar control will be provided by the selection of glazing/shading to avoid overheating in summer and increase passive gains in winter.
- Natural daylighting will improve occupant comfort and reduce the requirement for artificial lighting, saving energy.

At this stage an initial energy model has been developed for the building to estimate the building performance against each of the requirements.

## 3.1 Energy Efficient Services

After assessing the contribution of the passive elements to the overall energy balance, the aim is to further reduce energy consumption by selecting efficient mechanical and electrical systems and efficient controls to manage the energy used during operation.

The option of a natural ventilation or mixed mode solution was considered, however due to the nature of the building and what the local market expects / dictates, this solution was discounted.

On the basis of good practice, the following principles have been adopted in the current design:

### 3.1.1 Mechanical ventilation with Heat Recovery

Historically, fresh air in buildings was supplied through window openings and trickle vents, but as these are uncontrolled systems they can result in large amounts of wasted heat and rarely deliver the required levels of fresh air.

To minimise the heating load associated with the fresh air, central and local mechanical ventilation systems are proposed to be provided with heat recovery to extract waste heat from the exhaust air and use this to preheat the supply air.

The mechanical ventilation systems are to incorporate high efficiency heat recovery with a target efficiency in excess of 80%.

### 3.1.2 Building Services Insulation

Thermal insulation is to be provided in accordance with BS 5422: 2001 (Method for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range, -40°C to +700°C) for the following functions:

- Reduce heat loss and hence conserve energy on all heated water and air systems
- Inhibit freezing
- Prevent the formation of condensation on pipework, ductwork or equipment
- To protect personnel from exposure to extremes of temperature
- Control process temperatures

- All thermal insulation will be made from materials with zero ozone depletion potential (CFC and HCFC free)
- Insulation may also be used for acoustic reasons, particularly on rainwater and foul drainage systems
- Where LTHW or DHW services run along corridors, these services will be provided with 20% more insulation, over and above the British Standard, to prevent nuisance heat gains into the corridors.

### 3.1.3 Motor Efficiency

All pumps and fans are to be provided with high efficiency motors to reduce energy consumption and energy costs.

Where variable speed pumps and fans are provided, the flow volumes are to be set during the commissioning period by varying the fan / pump speed rather than by increasing the system resistance by means of regulating valves or balancing dampers.

### 3.1.4 Lighting Efficacy and Controls

Presence lighting sensors will be installed to prevent unwarranted usage of lighting in communal areas and internal circulation zones.

### 3.1.5 Low and Zero Carbon Technologies

At the previous stage, roof level PV, heat pump technology, fibre optic lighting and battery energy storage were considered. These technologies were further assessed in the current design stage with the main conclusion being that fibre optic lighting and battery energy storage are to be removed from the design with heat pumps and roof level PV to form the core of the low carbon operational energy strategy.

Fibre optic lighting and energy storing from PV generation were deemed unsuitable due to logistical, spatial and financial reasons.

### 3.1.6 Controls

The controls package for each system should be fully compatible with the proposed central BMS to enable optimal energy monitoring and control. This is particularly important in monitoring afterhours usage and reducing any waste such as HVAC running when conditioning is not required.

### 3.1.7 System Sizing

To minimise auxiliary energy from pumps and fans, ductwork and pipework is to be sized to a lower pressure drop/metre. This will reduce the resistance that fans and pumps have to overcome which will in turn reduce energy consumption.

Ductwork: 0.5 pa/m  
Pipework: 200 pa/m

For coordination purposes, the above limits may be disregarded on final lengths of pipework/ductwork before an outlet.

## 3.2 Energy Strategy Performance aspirations

Following a comprehensive run of sensitivity checks for the constructions of the building, an optimised set of values was determined. The below table highlights these values as well as the general performance aspirations that are to be adopted at the next stage of the design development. These will be used in the development of the energy models to demonstrate compliance with the regulatory requirements.

| Inputs                                                                                     |                                     |
|--------------------------------------------------------------------------------------------|-------------------------------------|
| Version of software                                                                        | IESVE 2022                          |
| Planning Use Class                                                                         | A1: Retail<br>A3: F&B<br>B1: Office |
| Building Fabric                                                                            |                                     |
| Floor average area weighted U-value ( $\text{W/m}^2\text{K}$ )                             | 0.10                                |
| Roof/ terrace U-value ( $\text{W/m}^2\text{K}$ )                                           | 0.10                                |
| External wall average area weighted U-value ( $\text{W/m}^2\text{K}$ )                     | 0.20                                |
| External window (including frame) average area weighted U-value ( $\text{W/m}^2\text{K}$ ) | 1.60                                |

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|                                                                                   |                                                                    |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Façade total solar transmission g-value                                           | 0.35                                                               |
| Glazing visible light transmission (VLT)                                          | 0.70                                                               |
| Glazing frame factor (%)                                                          | 10%                                                                |
| Personnel Doors U-value (W/m <sup>2</sup> K)                                      | 2.00                                                               |
| Façade Louvred Panel U-value (W/m <sup>2</sup> K)                                 | 0.50                                                               |
| Air permeability @ 50 Pascals (m <sup>3</sup> /(hr.m <sup>2</sup> ))              | 3.00                                                               |
| Glazing Area                                                                      |                                                                    |
| Building Average                                                                  | 40%                                                                |
| Building Services Systems                                                         |                                                                    |
| Air- Source Heat Pumps (Cooling)                                                  | 2.73 (EER) 4.45 (ESEER)                                            |
| Air-Source Heat Pumps (Heating)                                                   | 2.44 (COP) 4.01 (SCoP)                                             |
| Water-Source Heat Pump (DHW)                                                      | 4.97 (COP) 3.25 (SCoP)                                             |
| MVHR (SFP)                                                                        | 1.170 (W/l/s)                                                      |
| MVHR Heat Recovery                                                                | 84.2% (dry) 91.4% (wet)                                            |
| Lighting Systems                                                                  | 100% LED                                                           |
| Luminaire efficacies                                                              | 4.5 W/m <sup>2</sup> – 8.0 W/m <sup>2</sup>                        |
| Lighting controls - offices, reception, gym, circulation, toilets, changing rooms | Presence detection sensors                                         |
| Daylight dimming - offices, reception                                             | 6.0m perimeter zones                                               |
| Constant Illuminance Control - Offices only                                       | Yes                                                                |
| Renewables                                                                        |                                                                    |
| PVs on the roof                                                                   | Approximately 620m <sup>2</sup> and 127,300kWh generation capacity |

### 3.3 Modelled Scenarios

To ensure that results are reflective of a variety of future scenarios, CWC have worked with Bruntwood to create 3 scenarios that have been modelled and simulated at each stage of the analysis for the offices and main circulation areas. An additional scenario, CWC Mid, has been added that reflects a slight reduction of the Mid scenario. We believe this to be the most realistic scenario on average across the building.

|                                                           | Low                                           | Mid                                           | High                                          | CWC Mid                                       |
|-----------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Occupancy Density                                         | 12                                            | 10                                            | 8                                             | 10                                            |
| Operating Hours / Days                                    | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Heating & Cooling Set Points                              | 21°C Heating<br>24°C Cooling<br>16°C set back | 21°C Heating<br>24°C Cooling<br>16°C set back | 21°C Heating<br>24°C Cooling<br>16°C set back | 21°C Heating<br>24°C Cooling<br>16°C set back |
| Heating & Cooling Hours / Days                            | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Out of Hours Heating / Cooling Provision                  | Heating night<br>set back                     | Heating night<br>set back                     | Heating night<br>set back                     | Heating night<br>set back                     |
| Ventilation Rates (litres/second/person)                  | 12l/s/person                                  | 12l/s/person                                  | 12l/s/person                                  | 12l/s/person                                  |
| Ventilation Hours / Days                                  | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Out of Hours Ventilation Provision                        | None                                          | None                                          | None                                          | None                                          |
| Domestic Hot Water Provision<br>(litres/person/day)       | 8                                             | 8                                             | 8                                             | 8                                             |
| Office Small Power Loads (W/m2)                           | 8 W/m2                                        | 15 W/m2                                       | 25 W/m2                                       | 11 W/m2                                       |
| Office Small Power Hours / Days                           | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Office Out of Hours Small Power Provision                 | 20%                                           | 20%                                           | 20%                                           | 20%                                           |
| Common Areas Small Power Loads (W/m2)                     | 5 W/m2                                        | 5 W/m2                                        | 5 W/m2                                        | 5 W/m2                                        |
| Common Areas Small Power Hours / Days                     | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Common Areas Out of Hours Small Power<br>Provision (W/m2) | 1 W/m2                                        | 1 W/m2                                        | 1 W/m2                                        | 1 W/m2                                        |
| Lighting Hours / Days                                     | 9:00 - 17:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 | 8:00 - 20:00<br>5 days a week                 | 8:00 - 18:00<br>5 days a week                 |
| Lighting Power Provision (W/m2)                           | 6 W/m2                                        | 6 W/m2                                        | 6 W/m2                                        | 4.5 W/m2                                      |

### 3.4 Leasing Considerations

The leasing terms should be considered at an early stage to ensure that the criteria set out within this report is achievable which will enable the building to respond to increasing regulation and growing focus on carbon emissions. Ultimately the Landlord and Tenants will work together to reduce carbon emissions in the building.

The key considerations are as follows:

- Hours of comfort conditions should be clearly specified and limited to between 8am and 6pm on weekdays.
- The Landlord should have the ability to reject out of hours requests for air conditioning.
- Internal conditions should be controlled between 21 (+/-2) and 24 (+/-2) degrees seasonally.
- Small power load should not exceed an average of 11W/m<sup>2</sup> across the combined total Tenant area for the building.
- Lighting load should not exceed an average of 4.5W/m<sup>2</sup> across the combined total Tenant area for the building.
- HVAC sensors are located to maximise system performance and to provide optimal system monitoring. Sensors should not be relocated from these locations during a Tenant fitout unless checked and confirmed by the Landlord.
- Following a Tenant fitout, the lease should enshrine the right of the Landlord to give final review and approval of the Tenant's fitout design to ensure that it is in accordance with the base build design conditions of which the energy modelling and results have been based upon.
- Landlord provided services to each Tenant should be fully metered and monitored with recording capability included.

## 4.0 UKGBC and Energy Intensity Performance

UKGBC (United Kingdom Green Building Council) have published energy performance targets for commercial offices that are aiming to achieve net zero carbon in operation. These targets are summarised in the following table:

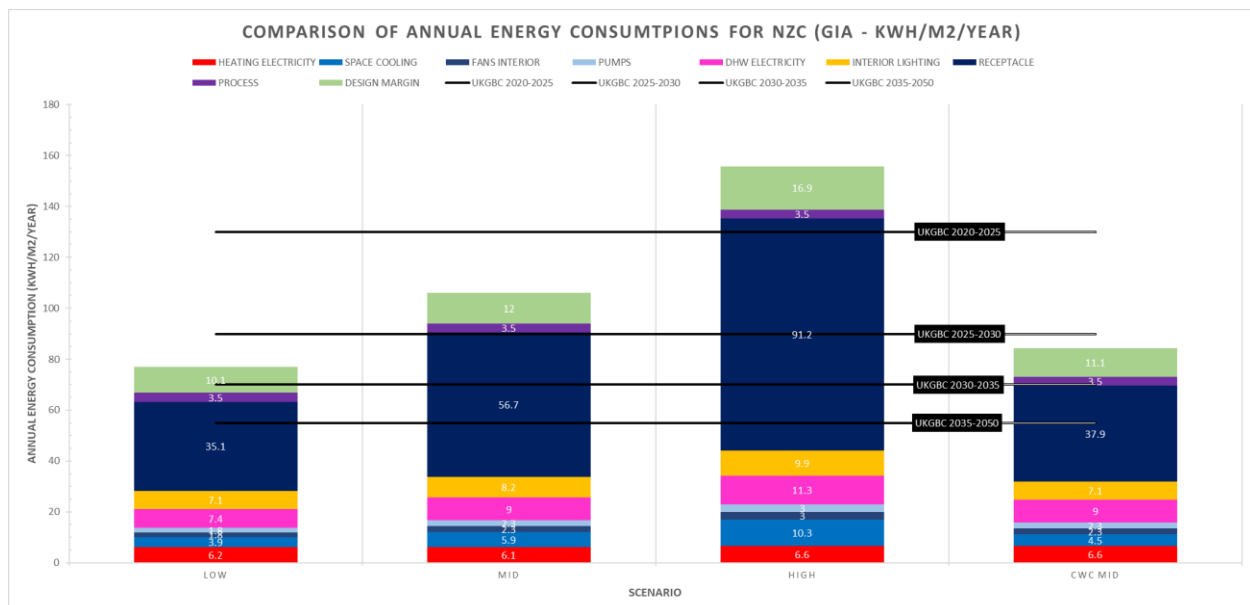
**Table 1: Energy performance targets for buildings targeting net zero carbon for operational energy**

| Scope                 | Metric                                        | Interim Targets |           |           | Paris Proof Target |
|-----------------------|-----------------------------------------------|-----------------|-----------|-----------|--------------------|
|                       |                                               | 2020-2025       | 2025-2030 | 2030-2035 | 2035-2050          |
| Whole building energy | kWh <sub>e</sub> /m <sup>2</sup> (NLA) / year | 160             | 115       | 90        | 70                 |
|                       | kWh <sub>e</sub> /m <sup>2</sup> (GIA) / year | 130             | 90        | 70        | 55                 |
|                       | DEC rating                                    | D90             | C65       | B50       | B40                |
| Base building energy  | kWh <sub>e</sub> /m <sup>2</sup> (NLA) / year | 90              | 70        | 55        | 35                 |
|                       | kWh <sub>e</sub> /m <sup>2</sup> (GIA) / year | 70              | 55        | 45        | 30                 |
|                       | NABERS UK star rating                         | 4.5             | 5         | 5.5       | 6                  |
| Tenant energy         | kWh <sub>e</sub> /m <sup>2</sup> (NLA) / year | 70              | 45        | 35        | 35                 |

NLA = net lettable area      GIA = gross internal area

Bruntwood are aiming for an energy intensity of 55kWh<sub>e</sub>/m<sup>2</sup>(GIA)/yr or less and a DEC rating of B40, with a minimum requirement of 90kWh<sub>e</sub>/m<sup>2</sup>(GIA)/yr or less and a DEC rating of C65. As the above table shows, this translates to a minimum requirement to meet the UKGBC 2025-2030 interim target and an aspirational aim to achieve the 2035-2050 "Paris Proof Target".

As modelled, the building performance in terms of energy intensity (kWh/m<sup>2</sup>/year GIA) is as follows:



The worst-case result (High scenario) yields an annual energy intensity figure of 155.7kWh/m<sup>2</sup>/yr. This does not exceed the Bruntwood minimum target of 90kWh/m<sup>2</sup>/yr (UKGBC 2025-2030 interim target). However, this is a worst-case scenario and so is not a fair reflection of building performance. We believe the most realistic scenario to be the CWC Mid scenario due to the lower equipment load that has been applied in accordance with NABERS design for performance (dfp) guidance. For reference, NABERS dfp guidance recommends an average load of 10-12W/m<sup>2</sup> across the office areas. The annual energy intensity figure for this scenario was 84.3kWh/m<sup>2</sup>/yr which exceeds the Bruntwood minimum requirement of 90kWh/m<sup>2</sup>/yr and meets the UKGBC 2025-2030 interim target.

The Low scenario largely ties in with the LETI Climate Emergency Design Guide criteria for commercial offices and so despite being ambitious, it should be considered as a feasible scenario for the building. The Low scenario modelling outputs indicated an annual energy intensity figure of 76.9kWh/m<sup>2</sup>/yr which comfortably exceeds the Bruntwood minimum target of 90kWh/m<sup>2</sup>/yr (UKGBC 2025-2030 interim target) and comes close to the UKGBC 2030-2035 interim target of 70kWh/m<sup>2</sup>/yr.

The aspirational target of 55kWh/m<sup>2</sup>/yr (UKGBC 2035-2050 Paris Proof Target) appears to be unachievable based on the above results. However, there are still refinements to be made to the energy model at the next design stage including; further diversification of loads and profiles, detailed HVAC modelling and rationalisation of assumptions currently made for areas where detail has not been available. Furthermore, the additional detail and refinement will allow for the removal of design margins. All of this will contribute towards a significant reduction in energy intensity which should enable the aspirational target of 55kWh/m<sup>2</sup>/yr (UKGBC 2035-2050 Paris Proof Target) to be met.

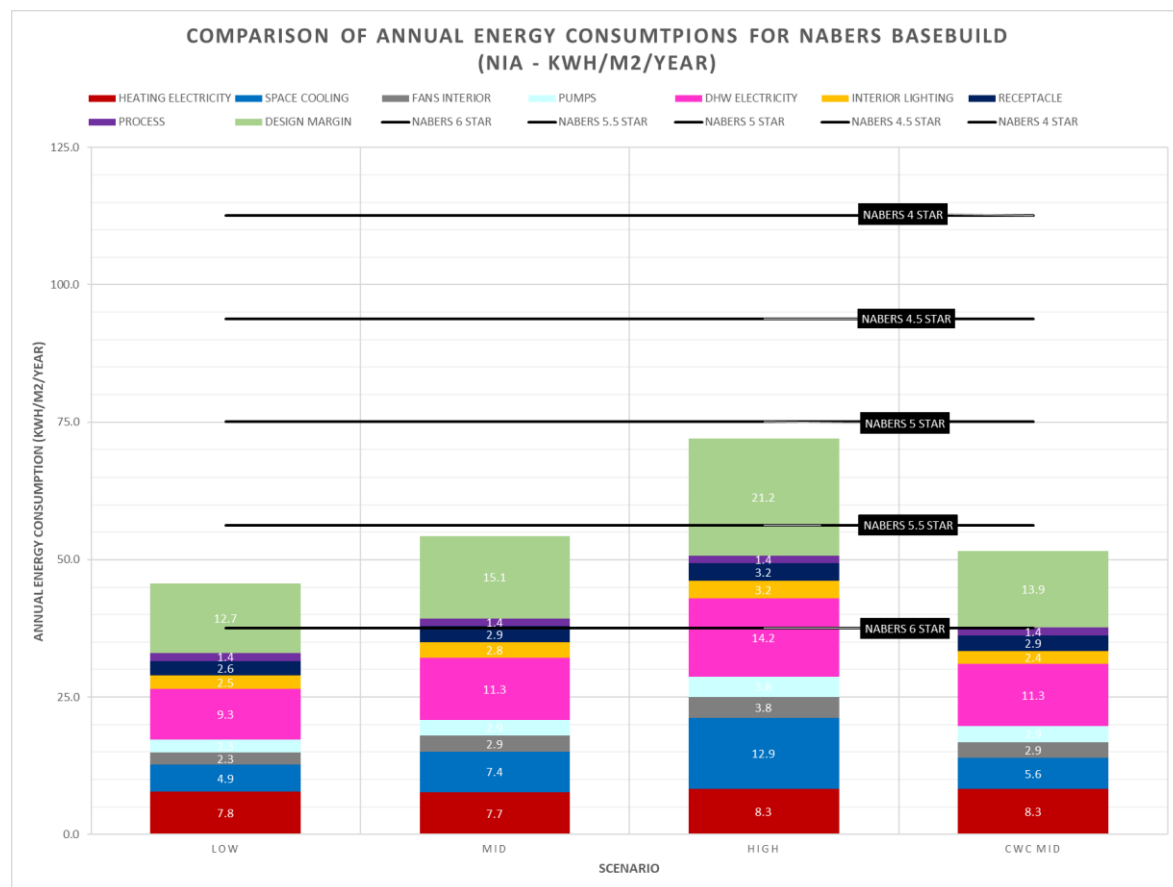
## 5.0 NABERS

NABERS UK is an adaptation of the highly successful rating programme NABERS that operates in Australia. Launched in 1999, NABERS is widely considered to be a world leading environmental performance rating tool for commercial buildings. The highest achievable rating is 6-stars.

Bruntwood have targeted a NABERS 5-star rating as a minimum requirement, with an aspirational target of NABERS 6 star. In its current form, the building has an NIA (net internal area) of 24,989m<sup>2</sup> and has NIA by NABERS definition is the area of the evaluated building that is available to be tenanted or can be made available to be tenanted under conditions set out in NABERS UK – The Rules, Section 4 – Rated Area.

The building has been assessed on 60 occupied hours per week (based on 12 hours/weekday).

In its current form and with the proposed systems and installations, the Base Building's energy consumption suggests that a NABERS 5.5-star rating is achievable:



As can be seen on the results graph above, all modelled scenarios, excluding the High scenario, achieve a NABERS 5.5-star rating. All scenarios meet the Bruntwood minimum requirement of a NABERS 5-star rating.

To achieve a NABERS 6-star rating, the annual energy intensity would have to reduce to 37.5kWh/m<sup>2</sup>/yr, a 8.5kWh/m<sup>2</sup>/yr reduction from the current Low scenario result. Following improvements of power efficiencies and technology during the building's life cycle, theoretically the building should be capable of closing this gap and achieving a NABERS 6-star rating.

For reference, see below summary of energy intensity limits for each NABERS rating based on the proposed NIA of the building:

| NABERS Rating | Energy Intensity Limit (kWh/m2/yr) |
|---------------|------------------------------------|
| 6 Star        | 37.5                               |
| 5.5 Star      | 56.3                               |
| 5 Star        | 75.1                               |
| 4.5 Star      | 93.8                               |
| 4 Star        | 112.6                              |

The above energy

Note that for NABERS ratings, the energy intensity value should not include energy associated with any of the following:

- Lighting within the NIA
- Plug loads such as office equipment within the NIA
- Stand-alone domestic hot water units in the NIA
- Local pollutant ventilation fans in the NIA
- Local air conditioning energy in the NIA
- Electric vehicle charging points
- Antennas/transmissions towers
- Services to non-office spaces

For further detail refer to NABERS UK – The Rules document.

## 6.0 EPC

Bruntwood have set a minimum requirement for an EPC rating of A.

For the EPC ratings, the building is split into 4 separate zones; Offices and Landlord, Retail 01, Retail 02 and F&B Café Unit. The calculated EPC ratings are shown below:

|                 | Target Emission<br>Rate<br>kgCO <sub>2</sub> /m <sup>2</sup> /year | Building<br>Emission Rate<br>kgCO <sub>2</sub> /m <sup>2</sup> /year | %<br>Improvement<br>over Part L2A | Expected<br>BREEAM<br>ENE01<br>Credits | EPC<br>Rating |
|-----------------|--------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------|----------------------------------------|---------------|
| B1: Offices     | 21.5                                                               | 12.4                                                                 | 42.32                             | 6                                      | A 24          |
| A3.4.5: Café    | 57.6                                                               | 36.9                                                                 | 35.94                             | 6                                      | A 24          |
| A1.2.: Retail 1 | 35.6                                                               | 18.2                                                                 | 48.88                             | 6                                      | A 17          |
| A1.2.: Retail 2 | 40.3                                                               | 19.7                                                                 | 51.12                             | 7                                      | A 16          |

For full results and methodology, refer to CWC Part L2A Compliance Report, ref: CS3-CWC-03-XX-RP-ME-0002.

## 7.0 On-Site Generation

Bruntwood have set a target for on-site generation to provide either 20% of the building's predicted energy use or equivalent of two floors of the building's energy use.

The free area at roof level that is available for PV installation has reduced as the design has progressed. Service routes, items of plant and associated access requirements have dictated a reduction in the PV allowance from 760m<sup>2</sup> to 620m<sup>2</sup>.

On-site generation, based on 712m<sup>2</sup> of PV (424 PV panels) installed at roof level, is estimated to produce 127,300.3kWh of electricity annually. This equates to 5% of the buildings predicated annual energy consumption for the best-case Low modelling scenario. This falls far below the Bruntwood target of 20%.

Based on the above being the best-case scenario, it appears unlikely that PV generation will be able to offset 20% of the building's annual energy consumption or any 2 floors of the building as per the Bruntwood target.

However, the PV proposal is likely to generate the equivalent of approximately 13% of the Landlord's energy consumption (discounting Tenant plug-in power and lighting) and therefore provides a significant saving.

## 8.0 APPENDICES

### 8.1 Appendix A – Energy Modelling Results – CWC SCENARIO

|                      |                                               |
|----------------------|-----------------------------------------------|
| <b>Project:</b>      | No3 Circle Square S3 CWC 2                    |
| <b>Address:</b>      |                                               |
| <b>Climate File:</b> | Manchester_DSY1_2020High50_.epw               |
| <b>Simulation:</b>   | 2466 No3 Circle Square - S3 CWC Scenario2.apr |

| Annual Energy Consumption (kWh/m <sup>2</sup> /year) & CO2 kgCO <sub>2</sub> /m <sup>2</sup> /yr |                                                                                     |             |               |               |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|---------------|---------------|
| Energy End Use                                                                                   |                                                                                     | Site Energy | Source Energy | CO2 Emissions |
| Heating Fossil Fuel                                                                              |    | 0.0         | 0.0           | 0.0           |
| Heating Electricity                                                                              |    | 6.6         | 20.7          | 3.4           |
| Space Cooling                                                                                    |    | 4.5         | 14.2          | 2.3           |
| Fans Interior                                                                                    |    | 2.3         | 7.1           | 1.2           |
| Heat Rejection                                                                                   |    | 0.0         | 0.0           | 0.0           |
| Pumps                                                                                            |    | 2.3         | 7.1           | 1.2           |
| DHW Fossil Fuel                                                                                  |    | 0.0         | 0.0           | 0.0           |
| DHW Electricity                                                                                  |   | 9.0         | 28.3          | 4.7           |
| Interior Lighting                                                                                |  | 7.1         | 22.4          | 3.7           |
| Exterior Lighting                                                                                |  | 0.0         | 0.0           | 0.0           |
| Receptacle                                                                                       |  | 37.9        | 119.5         | 19.7          |
| Data Center                                                                                      |  | 0.0         | 0.0           | 0.0           |
| Cooking Fossil Fuel                                                                              |  | 0.0         | 0.0           | 0.0           |
| Cooking Electricity                                                                              |  | 0.0         | 0.0           | 0.0           |
| Elevators & Escalators                                                                           |  | 0.0         | 0.0           | 0.0           |
| Refrigeration                                                                                    |  | 0.0         | 0.0           | 0.0           |
| Process                                                                                          |  | 3.5         | 11.2          | 1.8           |
| TOTAL (ex renewables)                                                                            |                                                                                     | 73          | 230           | 37            |

## 8.2 Appendix B – Energy Modelling Results – LOW SCENARIO

|                      |                                               |
|----------------------|-----------------------------------------------|
| <b>Project:</b>      | No3 Circle Square S3 Low 2                    |
| <b>Address:</b>      |                                               |
| <b>Climate File:</b> | Manchester_DSY1_2020High50_.epw               |
| <b>Simulation:</b>   | 2466 No3 Circle Square - S3 Low Scenario2.aps |

| Annual Energy Consumption (kWh/m <sup>2</sup> /year) & CO2 kgCO2/m <sup>2</sup> /yr |                                                                                     |             |               |               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|---------------|---------------|
| Energy End Use                                                                      |                                                                                     | Site Energy | Source Energy | CO2 Emissions |
| Heating Fossil Fuel                                                                 |    | 0.0         | 0.0           | 0.0           |
| Heating Electricity                                                                 |    | 6.2         | 19.4          | 3.2           |
| Space Cooling                                                                       |    | 3.9         | 12.2          | 2.0           |
| Fans Interior                                                                       |    | 1.8         | 5.6           | 0.9           |
| Heat Rejection                                                                      |    | 0.0         | 0.0           | 0.0           |
| Pumps                                                                               |    | 1.8         | 5.6           | 0.9           |
| DHW Fossil Fuel                                                                     |    | 0.0         | 0.0           | 0.0           |
| DHW Electricity                                                                     |    | 7.4         | 23.4          | 3.9           |
| Interior Lighting                                                                   |    | 7.1         | 22.4          | 3.7           |
| Exterior Lighting                                                                   |   | 0.0         | 0.0           | 0.0           |
| Receptacle                                                                          |  | 35.1        | 110.6         | 18.2          |
| Data Center                                                                         |  | 0.0         | 0.0           | 0.0           |
| Cooking Fossil Fuel                                                                 |  | 0.0         | 0.0           | 0.0           |
| Cooking Electricity                                                                 |  | 0.0         | 0.0           | 0.0           |
| Elevators & Escalators                                                              |  | 0.0         | 0.0           | 0.0           |
| Refrigeration                                                                       |  | 0.0         | 0.0           | 0.0           |
| Process                                                                             |  | 3.5         | 11.2          | 1.8           |
| TOTAL (ex renewables)                                                               |                                                                                     | 66          | 210           | 34            |

## 8.3 Appendix C – Energy Modelling Results – MID SCENARIO

|                      |                                               |
|----------------------|-----------------------------------------------|
| <b>Project:</b>      | No3 Circle Square S3 Mid 2                    |
| <b>Address:</b>      |                                               |
| <b>Climate File:</b> | Manchester_DSY1_2020High50_.epw               |
| <b>Simulation:</b>   | 2466 No3 Circle Square - S3 Mid Scenario2.aps |

| Annual Energy Consumption (kWh/m <sup>2</sup> /year) & CO2 kgCO <sub>2</sub> /m <sup>2</sup> /yr |             |               |               |
|--------------------------------------------------------------------------------------------------|-------------|---------------|---------------|
| Energy End Use                                                                                   | Site Energy | Source Energy | CO2 Emissions |
| Heating Fossil Fuel                                                                              | 0.0         | 0.0           | 0.0           |
| Heating Electricity                                                                              | 6.1         | 19.3          | 3.2           |
| Space Cooling                                                                                    | 5.9         | 18.6          | 3.1           |
| Fans Interior                                                                                    | 2.3         | 7.1           | 1.2           |
| Heat Rejection                                                                                   | 0.0         | 0.0           | 0.0           |
| Pumps                                                                                            | 2.3         | 7.1           | 1.2           |
| DHW Fossil Fuel                                                                                  | 0.0         | 0.0           | 0.0           |
| DHW Electricity                                                                                  | 9.0         | 28.3          | 4.7           |
| Interior Lighting                                                                                | 8.2         | 25.8          | 4.3           |
| Exterior Lighting                                                                                | 0.0         | 0.0           | 0.0           |
| Receptacle                                                                                       | 56.7        | 178.6         | 29.4          |
| Data Center                                                                                      | 0.0         | 0.0           | 0.0           |
| Cooking Fossil Fuel                                                                              | 0.0         | 0.0           | 0.0           |
| Cooking Electricity                                                                              | 0.0         | 0.0           | 0.0           |
| Elevators & Escalators                                                                           | 0.0         | 0.0           | 0.0           |
| Refrigeration                                                                                    | 0.0         | 0.0           | 0.0           |
| Process                                                                                          | 3.5         | 11.2          | 1.8           |
| <b>TOTAL (ex renewables)</b>                                                                     | <b>93</b>   | <b>295</b>    | <b>48</b>     |

## 8.4 Appendix D – Energy Modelling Results – HIGH SCENARIO

|                      |                                                |
|----------------------|------------------------------------------------|
| <b>Project:</b>      | No3 Circle Square S3 High 2                    |
| <b>Address:</b>      |                                                |
| <b>Climate File:</b> | Manchester_DSY1_2020High50_.epw                |
| <b>Simulation:</b>   | 2466 No3 Circle Square - S3 High Scenario2.apr |

| Annual Energy Consumption (kWh/m <sup>2</sup> /year) & CO2 kgCO <sub>2</sub> /m <sup>2</sup> /yr |             |               |               |
|--------------------------------------------------------------------------------------------------|-------------|---------------|---------------|
| Energy End Use                                                                                   | Site Energy | Source Energy | CO2 Emissions |
| Heating Fossil Fuel                                                                              | 0.0         | 0.0           | 0.0           |
| Heating Electricity                                                                              | 6.6         | 20.7          | 3.4           |
| Space Cooling                                                                                    | 10.3        | 32.4          | 5.3           |
| Fans Interior                                                                                    | 3.0         | 9.3           | 1.5           |
| Heat Rejection                                                                                   | 0.0         | 0.0           | 0.0           |
| Pumps                                                                                            | 3.0         | 9.3           | 1.5           |
| DHW Fossil Fuel                                                                                  | 0.0         | 0.0           | 0.0           |
| DHW Electricity                                                                                  | 11.3        | 35.6          | 5.9           |
| Interior Lighting                                                                                | 9.9         | 31.2          | 5.1           |
| Exterior Lighting                                                                                | 0.0         | 0.0           | 0.0           |
| Receptacle                                                                                       | 91.2        | 287.3         | 47.3          |
| Data Center                                                                                      | 0.0         | 0.0           | 0.0           |
| Cooking Fossil Fuel                                                                              | 0.0         | 0.0           | 0.0           |
| Cooking Electricity                                                                              | 0.0         | 0.0           | 0.0           |
| Elevators & Escalators                                                                           | 0.0         | 0.0           | 0.0           |
| Refrigeration                                                                                    | 0.0         | 0.0           | 0.0           |
| Process                                                                                          | 3.5         | 11.2          | 1.8           |
| <b>TOTAL (ex renewables)</b>                                                                     | <b>138</b>  | <b>436</b>    | <b>71</b>     |

## 8.5 Appendix E – NABERS Result - CWC SCENARIO



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### NABERS UK Simple Calculator - Energy for Offices



Version: 1.1 Date: Apr-21

The simple rating calculator for Energy for Offices helps you calculate the star rating of an office building for an amount of energy that you specify. To ensure you achieve the rating, you should allow a factor of safety.

Users may also wish to use the service inclusions calculator (see separate tab) to assist with calculating the total energy consumption. These figures are not automatically added to this calculator, they must be added manually by the user to the Electricity consumption - cell H16.

#### ENTER THE BASE BUILDING INFORMATION

|                                                                 |                                |
|-----------------------------------------------------------------|--------------------------------|
| Building Postcode                                               | M15 4LD                        |
| Hours each week with occupancy levels of 20% or more (hrs/week) | 60.0                           |
| Net Internal Area of the building (m2)                          | 24,979.00                      |
| Energy Consumption:                                             | Electricity (kWh) 1,287,974.00 |
|                                                                 | Gas (kWh)                      |
|                                                                 | District Heating (kWh)         |
|                                                                 | District Cooling (kWh)         |
|                                                                 | Coal (kg)                      |
|                                                                 | Diesel (L)                     |

#### RESULTS



STAR RATING

5.5

STARS

## 8.6 Appendix F – NABERS Result - LOW SCENARIO



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### NABERS UK Simple Calculator - Energy for Offices



Version: 1.1 Date: Apr-21

**The simple rating calculator for Energy for Offices helps you calculate the star rating of an office building for an amount of energy that you specify. To ensure you achieve the rating, you should allow a factor of safety.**

Users may also wish to use the service inclusions calculator (see separate tab) to assist with calculating the total energy consumption. These figures are not automatically added to this calculator, they must be added manually by the user to the Electricity consumption - cell H16.

#### ENTER THE BASE BUILDING INFORMATION

|                                                                 |                                |
|-----------------------------------------------------------------|--------------------------------|
| Building Postcode                                               | M15 4LD                        |
| Hours each week with occupancy levels of 20% or more (hrs/week) | 60.0                           |
| Net Internal Area of the building (m2)                          | 24,979.00                      |
| Energy Consumption:                                             | Electricity (kWh) 1,140,556.00 |
|                                                                 | Gas (kWh)                      |
|                                                                 | District Heating (kWh)         |
|                                                                 | District Cooling (kWh)         |
|                                                                 | Coal (kg)                      |
|                                                                 | Diesel (L)                     |

#### RESULTS



STAR RATING

5.5

STARS

## 8.7 Appendix F – NABERS Result - MID SCENARIO



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### NABERS UK Simple Calculator - Energy for Offices



Version: 1.1 Date: Apr-21

**The simple rating calculator for Energy for Offices helps you calculate the star rating of an office building for an amount of energy that you specify. To ensure you achieve the rating, you should allow a factor of safety.**

Users may also wish to use the service inclusions calculator (see separate tab) to assist with calculating the total energy consumption. These figures are not automatically added to this calculator, they must be added manually by the user to the Electricity consumption - cell H16.

#### ENTER THE BASE BUILDING INFORMATION

|                                                                 |              |
|-----------------------------------------------------------------|--------------|
| Building Postcode                                               | M15 4LD      |
| Hours each week with occupancy levels of 20% or more (hrs/week) | 60.0         |
| Net Internal Area of the building (m2)                          | 24,979.00    |
| Energy Consumption:                                             |              |
| Electricity (kWh)                                               | 1,357,497.00 |
| Gas (kWh)                                                       |              |
| District Heating (kWh)                                          |              |
| District Cooling (kWh)                                          |              |
| Coal (kg)                                                       |              |
| Diesel (L)                                                      |              |

#### RESULTS



STAR RATING

5.5

STARS

## 8.8 Appendix F – NABERS Result - HIGH SCENARIO



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### NABERS UK Simple Calculator - Energy for Offices



Version: 1.1 Date: Apr-21

**The simple rating calculator for Energy for Offices helps you calculate the star rating of an office building for an amount of energy that you specify. To ensure you achieve the rating, you should allow a factor of safety.**

Users may also wish to use the service inclusions calculator (see separate tab) to assist with calculating the total energy consumption. These figures are not automatically added to this calculator, they must be added manually by the user to the Electricity consumption - cell H16.

#### ENTER THE BASE BUILDING INFORMATION

|                                                                 |                                |
|-----------------------------------------------------------------|--------------------------------|
| Building Postcode                                               | M15 4LD                        |
| Hours each week with occupancy levels of 20% or more (hrs/week) | 60.0                           |
| Net Internal Area of the building (m2)                          | 24,979.00                      |
| Energy Consumption:                                             | Electricity (kWh) 1,797,196.00 |
|                                                                 | Gas (kWh)                      |
|                                                                 | District Heating (kWh)         |
|                                                                 | District Cooling (kWh)         |
|                                                                 | Coal (kg)                      |
|                                                                 | Diesel (L)                     |

#### RESULTS



STAR RATING

5

STARS