

Environmental Standards and Circular Economy Statement

Renaissance, Deansgate

October 2021



Turley
Sustainability



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1. Introduction

1.1 Introduction

This Environmental Standards and Circular Economy Statement has been prepared by Turley on behalf of Deansgate SOF Alliance LeaseCo Limited, a joint venture between Property Alliance Group (PAG) and an affiliate of Starwood Capital (SCG), to support a full planning application for the residential element of its wider masterplan proposals for high quality mixed-use development at the Renaissance hotel complex.

The proposals provide for a new, high quality residential development that will provide approximately 300 residential units with ground floor retail/ leisure units.

This Statement provides detail of the measures incorporated in to the development proposals to ensure suitable levels of sustainability performance in accordance with local and national planning policy.

1.2 Site Context

The application site extends to approximately 0.35 hectares and forms part of the wider Renaissance hotel complex, which is located at the northern end of Deansgate in Manchester City Centre. The wider site fronts onto Deansgate, Blackfriars Street, and Victoria Bridge Streets, and the River Irwell.

The Renaissance complex currently comprises a vacant 15-storey, 203 bedroom hotel building, a multi-storey car park, a restaurant and a dilapidated former office building (Premier House) which has been vacant for a significant number of years.

This particular application relates to the proposed development of a high quality landmark residential building on the northernmost area of the Renaissance complex, following the consented

partial demolition of Premier House which will clear the plot for development.

The site forms part of the wider Renaissance Hotel complex which has long been a longstanding strategic regeneration priority for Manchester City Council (MCC) and is the last remaining undeveloped site within the 1999 City Centre Masterplan.

During the last 20 years, various attempts have been made to bring forward its redevelopment. Most recently, this was in the form of a mixed use scheme in 2008, comprising 4 new buildings, the tallest at 35 storeys and a 2018 Strategic Regeneration Framework by MCC and Urban & Civic. Despite the efforts of well-respected developers, MCC officers, and Sir Howard Bernstein, the lack of activity over the last 20 years illustrates the complexities associated with bringing forward the meaningful regeneration of the site and all previous proposals for wholesale demolition and redevelopment have ultimately proven undeliverable.

The current masterplan proposals have taken a different approach to those that have failed in the past focusing on the part-retention and part-redevelopment of the wider site – one that the Applicants believe is the only way that this site can be realistically brought forward – and ultimately represents a deliverable scheme.

Various planning applications are being submitted to MCC for approval pursuant to the overall illustrative masterplan, and the high quality residential development subject to this particular application is a crucial and fundamental part of ensuring the delivery of this strategically important site.

The extent of the application site is shown on the Location Plan submitted with the planning application, illustrated in **Figure 1** overleaf.

1.3 Proposed Development

The proposal is for the development of a new, high quality residential building at ground + 26 storeys which will sit appropriately within the surrounding context. The development will provide 300 residential units and will be supported by high quality amenity space, including new riverside public realm with a new leisure/ food and beverage offer, as well as communal and private roof terraces for new residents.

Ground floor retail units will be provided along Deansgate to animate this key route in conjunction with the new office building and public realm aspirations.

The design of the building has evolved in consultation with Manchester City Council, Manchester Cathedral, and Historic England and seeks to be appropriate in its setting through its siting, massing, and appearance that takes cues from the Cathedral and the Medieval Quarter.

In terms of public realm and landscape, the already submitted planning application relating to Premier House includes the landscape proposals to the back of pavement along Blackfriars and Deansgate, which is within the Applicant's ownership.

As part of this residential application, the Applicant is proposing further public realm including the provision of new riverside public realm areas west of the existing hotel building, as well as amenity space for residents in the area west of the residential building. Accordingly, the landscape and public realm proposals will transform the area of the site adjoining the Irwell, stretching along the full length of this boundary between Victoria Bridge Street and Blackfriars Street. Further new

landscaping is also proposed to the back of pavement along the Deansgate frontage of the residential building.

It should also be noted that, as part of the wider Masterplan vision, the Applicants have aspirations to transform Deansgate, expanding the area of public realm which can be achieved along this carriageway. However, these wider public realm proposals are subject to ongoing discussions with key stakeholders including MCC Highways and may therefore need to be applied for under a separate planning application.

The planning description for the proposed development is as follows:

"Full planning application for the erection of a part ground + 13 storey, part ground + 26 storey building to form 300 no. residential apartments and ground floor retail/ leisure floorspace (Class E/ Sui Generis), together with private amenity space for residents, new public realm including riverside walkway and leisure/ food and beverage space (Class E/ Sui Generis), new landscaping, parking, servicing, supporting infrastructure and associated works".

An illustration of the proposed redevelopment is shown in **Figure 2** on **Page 6**.

1.4 Document Structure

Chapter 2 of this report provides an overview of relevant national and local legislation, planning policy and guidance.

Chapter 3 provides detail of the sustainability and energy strategy of the proposed development, in line with local Planning Policy.

Chapter 4 reports the approach taken by the team to meet the principles of circular economy, and how this will be developed during detailed design.

Figure 1: Site Location [Jon Matthews Architects]

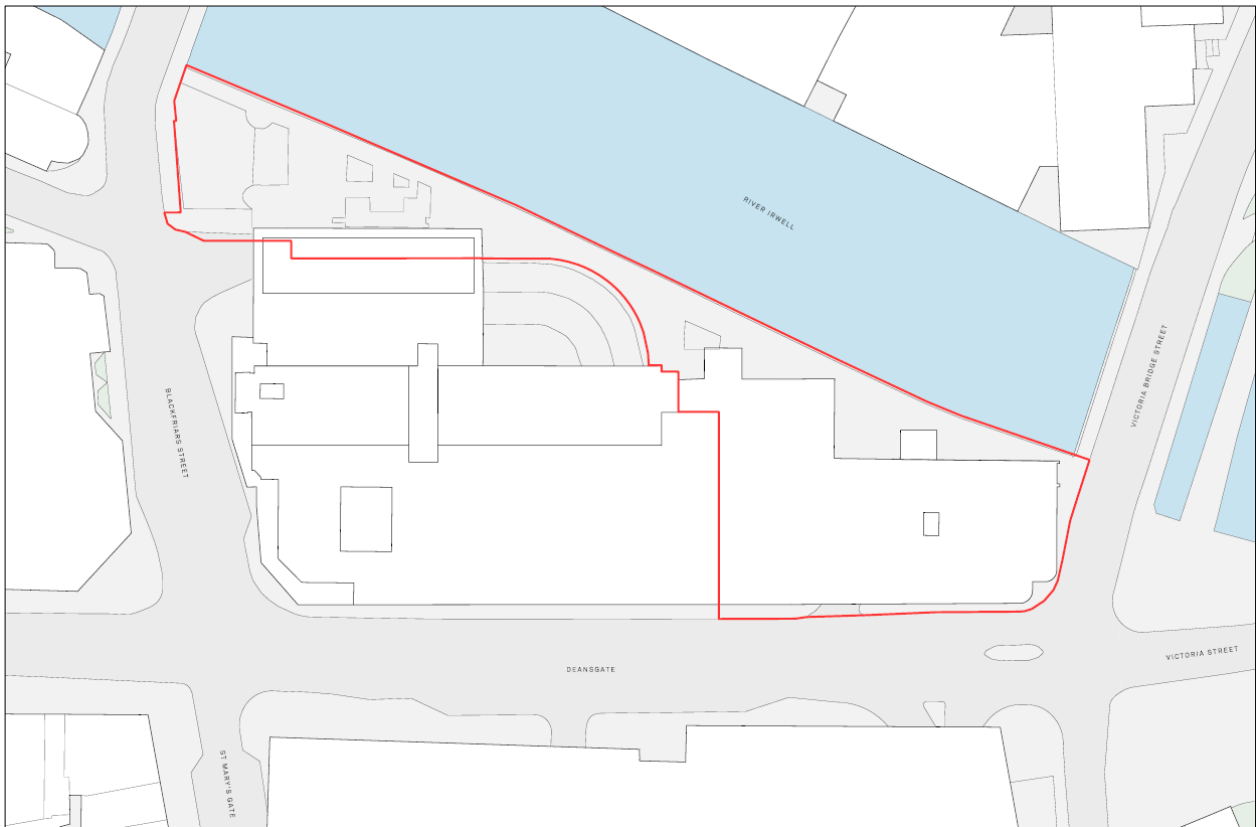


Figure 2: Illustration of the Proposed Development [Jon Matthews Architects]



2. Policy Context

This chapter provides an overview of the relevant sustainability planning policy and guidance from a national and local perspective.

2.1 National Policy

This section sets out a summary of current national guidance and policy in relation to sustainable development.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹ provides a framework for the development of locally-prepared plans and the government's planning policies for England and how these are expected to be applied.

Paragraph 7 of the NPPF states that: 'the purpose of the planning system is to contribute to the achievement of sustainable development'.

It states clearly that in order to deliver sustainable development, the planning system must perform three distinct objectives, aligned to the three pillars of sustainability, which must not be taken in isolation and should be pursued jointly:



An **economic** objective to help build 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, innovation and improved productivity; and by identifying and

coordinating the provision of infrastructure.



A **social** objective supporting strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and,



An **environmental** objective contributing to protecting and enhancing our natural, built and historic environment; including, making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

These objectives are key to the development of plans and the NPPF sets out a number of key themes for consideration which guide the preparation of local plans and policies, ensuring the delivery of sustainable development.

2.1.2 Planning Practice Guidance

Planning Practice Guidance (PPG) provides further advice on various planning issues associated with development, including those linked to sustainability and renewable energy and underpins the policies within the NPPF.

PPG is a material consideration in planning decisions and should be followed unless there are

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

clear reasons not to. It sets out how local authorities should include policies that protect the local environment and strategies to mitigate and adapt to climate change and supports developments that are functional and adaptable for the future.

The March 2019 PPG update² confirmed that Local Authorities have the option to set technical requirements exceeding the minimum requirements of the Building Regulations in respect of access, water and space where sufficient evidence is produced to justify the target.

2.1.3 National Design Guide

The National Design Guide³ was last updated in January 2021, and is based on the national planning policy practice guidance and objective for good design as set out in the NPPF. The Guide introduces ten characteristics of well-designed places which work together to create developments Character and Community, while positively addressing environmental issues affecting climate.

2.1.4 Building Regulations

Whilst not planning policy, the Building Regulations (and specifically Approved Document Part L: Conservation of Fuel and Power)⁴ set out the requirements for energy and carbon performance.

Periodic updates to these national regulations will drive energy efficiency and carbon reduction improvements. The Government has stated that developers will continue to have flexibility in how they meet carbon reduction targets; but that the emphasis is on using a “fabric first” approach.

Building on this, the response⁵ to the Future Homes Standard (FHS) consultation was published

in January 2021. The FHS 2025 aims to future proof the design of new homes to reduce carbon emissions and help meet the 2050 zero carbon target. To provide a stepping stone to the FHS, the 2021 Part L update requires a 31% CO₂ improvement on 2013 Part L. The interim standard will come into force in June 2022 and will be applicable to new homes which have not yet submitted a building notice from that point. Part 2 of the consultation, which details overheating assessments has now also been issued.

2.2 Local Planning Policy

Current and emerging Manchester City Council planning policy relating to sustainable development, energy and climate change is summarised below.

2.2.1 Manchester Core Strategy Development Plan Document (2012)

Manchester's Core Strategy (2012)⁶, is the key document in the Manchester Local Plan. It sets the out the long-term strategic policies for Manchester's future development and forms the framework against which planning applications are assessed. The following Core Strategy policies are of greatest relevance to sustainable development and the focus of this Statement.

Policy EN4 – Reducing CO₂ emissions by enabling low and zero Carbon Development – Development should be designed in accordance with the energy hierarchy to reduce energy demand through active and passive design measures meeting residual requirements through the use of zero carbon, renewable energy technologies. Developments are encouraged to take into account the following principles:

² <https://www.gov.uk/guidance/climate-change>

³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962113/National_design_guide.pdf

⁴ <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l>

⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956094/Government_response_to_Future_Homes_Standard_consultation.pdf

⁶ https://secure.manchester.gov.uk/downloads/download/5672/core_strategy

- Located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies where possible;
- Where possible new development and retrofit projects will be used as a mechanism to help improve the energy efficiency and where possible provide low and zero carbon energy to existing buildings; and
- Where appropriate, new development and retrofit projects are encouraged to connect to and/or make commitments to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing/potential decentralised energy networks.

Policy EN6 – Target framework for CO₂ reductions from low or zero carbon energy supplies –

Applications for development over 10 dwellings or 1,000m² floor area are expected to meet sustainability targets which vary depending on the scale of the development, where feasible.

Development that meets the criteria above is required to be accompanied by an energy statement which sets out the projected regulated energy demand and associated carbon emissions and how the following targets will be met. Development below the above thresholds is expected to meet the targets but does not need to have an accompanying energy statement.

For the purpose of this policy, development is split into three target categories:

Target 1 - Network development areas: Locations where the proximity of new buildings, the mix of use and density of development provides the right conditions to support district heating.

Target 2 - Electricity intense areas: Locations where the predominant building type has all electric fit out, such as retail units and leisure complexes.

Target 3 – Micro-generation areas: Locations where lower densities and fragmented mix of uses

tend to mean that only building scale solutions are practical.

An Energy Assessment is required to be submitted, and developers are permitted to use green infrastructure elements to contribute to the carbon reduction requirements provided adequate evidence is provided.

Table 1: Manchester Core Strategy CO₂ Targets

Target	CO ₂ Reduction
1	CHP/district heating or connection or where not feasible 15% increase on Part L 2010
2	10% increase on Part L 2010
3	15% increase on Part L 2010

Policy EN8 – Adaptation to Climate Change – All new development is expected to be adaptable to climate change and developments should have consideration of adaptation measures including:

- Minimising flood risk through sustainable drainage systems;
- Reducing the urban heat island effect through green infrastructure;
- Minimising overheating through passive design; and
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

Policy DM1 - Development Management – All new development should have regard to a range of sustainability issues including site location, accessibility, waste management, biodiversity and flood risk, as well as incorporating sustainable construction techniques. New residential development is expected to meet the requirements of the Code for Sustainable Homes standard, however this has now been withdrawn.

Policy CC5 – Transport – Developers should work to ensure that all users are able to access development by sustainable means, especially taking account of times when developments are likely to be busiest.

Policy EN9 - Green Infrastructure – New development is expected to maintain existing green infrastructure in terms of its quantity, quality and multiple function. Developers are also encouraged to enhance existing green infrastructure where possible.

Policy EN 14 - Flood Risk – Development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding.

Policy EN 17 - Water Quality – Development should avoid adverse impact on water quality, including during the construction phase, and minimise surface run-off.

Policy EN 19 Waste – Requires all developers to demonstrate the proposal's consistency with the principles of the waste hierarchy.

Policy DM 1 - Development Management – New development should have regard to the following specific issues:

- Appropriate siting, layout, scale, form, massing, materials and detail;
- Impact on the surrounding areas in terms of the design, scale and appearance of the proposed development;
- Development should have regard to the character of the surrounding area;
- Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes;
- Design for health; and

- Refuse storage and collection.

2.2.2 Guide to Development in Manchester Supplementary Planning Document (SPD) (2007)

This Guide to Development Supplementary Planning Document (SPD) (2007)⁷ provides guidance to develop and enhance environments within Manchester which are visually attractive, have a unique and positive sense of place and where properly caters for the functions which it accommodates, both now and in the future.

Chapter 4 of the SPD sets out Manchester City Council's expectations on the content of Environmental Standards Statements. This Statement addresses each of the topics within Chapter 4 of the SPD, noting where policy is met and in some cases exceeded.

2.2.3 Places for Everyone

Until December 2020 a joint development plan document of the ten Greater Manchester local authorities was being prepared, known as the Greater Manchester Spatial Framework (GMSF). However progression of the GMSF ceased following the decision by Stockport Council to withdraw.

Instead, a joint committee formed by the nine other boroughs has been formed to prepare 'Places for Everyone' (PfE), a joint development plan for jobs, new homes and sustainable growth across these boroughs.

Places for Everyone: Publication Plan⁸ was published in July 2021, with a period for representations taking place between 9th August and 3rd October 2021. Following this period, the Greater Manchester Combined Authority intend to submit the plan to the Secretary of State.

PfE sets out a number of ambitious sustainability policies, accounting for climate mitigation and

⁷ https://secure.manchester.gov.uk/site/scripts/download_info.php?downloadID=644&fileID=1424

⁸ <https://www.greatermanchester-ca.gov.uk/media/4682/places-for-everyone-compressed.pdf>

adaptation, social value, economic growth and the natural environment.

Policies include a requirement for new residential apartment developments to meet a space heat demand of 25kWh/m² and reduce energy demand by 20% compared to Part L 2013 (until 2025). Furthermore solar PV should be installed for an area equivalent to 20% ground floorspace.

Development will be expected to adopt a net zero carbon approach to operational carbon up to 2028, and incorporate construction carbon from then onwards. However, the practicalities of this policy including carbon calculation method and offset payments have not been fully confirmed yet.

Development should also achieve a net gain in biodiversity of at least 10%.

The policies within PfE are not considered further within this statement, due to its current stage of publication. However, the aspiration of Greater Manchester to become net zero carbon by 2038 is supported by the Applicants.

2.2.4 Local Plan Issues Consultation

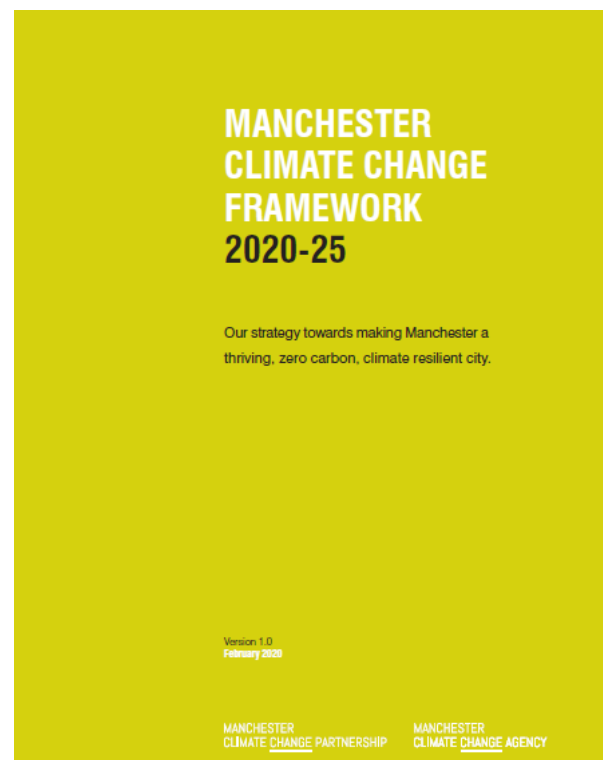
Manchester City Council Local Plan Issues Consultation (February 2020)⁹ explains how the new Local Plan will contribute to a zero carbon city by providing the spatial expression in support of the Council's intention to move towards a zero carbon Manchester by 2038 at the latest. The Issues Consultation covers a range of issues that will have a direct bearing on successfully meeting the zero carbon challenge by 2038.

2.2.5 Manchester Climate Change Framework 2020-25

The Manchester Climate Change Framework 2020-25 (February 2020)¹⁰ builds on the Draft Manchester Zero Carbon Framework 2020-38 (published February 2019) and Manchester City

Council's declaration of a climate emergency in July 2019.

The Framework sets the following objectives to be met by 2025:



Objective 1: Staying within our carbon budgets – including reducing CO₂ emission from our homes, workplaces and ground transport by at least 50% during 2020-25.

Objective 2: Climate adaptation and resilience – adapting the city's buildings, infrastructure and natural environment to the changing climate.

Objective 3: Health and wellbeing – improving the health and wellbeing of everyone in Manchester through actions that also contribute to our climate change mitigation and adaption objectives.

Objective 4: Inclusive, zero carbon and climate resilient economy – ensuring Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit.

⁹ https://manchester-consult.objective.co.uk/portal/planning/issues_and_options_2020/lpi?pointId=5581804

¹⁰ <http://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf>

2.2.6 Validation Requirements

Manchester City Council's Validation Checklist (2018)¹¹ requires applications for major new development to be accompanied by an Environmental Standards Statement to address the sustainability of the development proposals and demonstrate a 20% carbon reduction.

2.2.7 Pre-app Consultation

During pre-application discussions, Manchester City Council requested the production of a Sustainability and Circular Economy Statement. It was requested that this statement should *"detail at a high level the strategy for the approach to whole life carbon within the development. This high level strategy should then form the basis for the submission of a final statement"*.

The Officer also referenced the following resources:

- RIBA Sustainable Outcomes Guide (2019)¹²; and,
- The Mayor of London's Design for a Circular Economy Primer¹³.

Circular Economy has therefore been addressed as a standalone chapter within this Statement.

2.3 Planning Policy Summary

There are several consistent themes across national and local sustainability policy which are relevant to the Renaissance proposals.

A minimum 15% reduction in CO₂ emission beyond Building Regulations Part L 2010 is required through a combination of building envelope performance, energy efficiency and on-site zero / low carbon energy technology. This performance is equivalent to a circa 9% CO₂ reduction on Part L 2013. Furthermore, the latest Validation Checklist requires major new development to demonstrate a 20% carbon reduction.

The requirement under Core Strategy Policy DM1 to certify new residential development to the Code for Sustainable Homes is no longer applicable following the revocation of the Code for new planning applications by the 2015 Housing Standards Review.

Ensuring the development is resilient to a changing climate is a further key requirement at both national and local levels, particularly in relation to increased risk of floods and summertime overheating.

It is clear from the declaration of climate emergency and ambitious target to achieve carbon neutrality by 2038, that the Council and Greater Manchester Combined Authority expect new development to contribute to a carbon neutral future.

The following chapter details the approach proposed to address these policy requirements.

¹¹ https://secure.manchester.gov.uk/downloads/download/6914/planning_validation_checklists_2018

¹² <https://www.architecture.com/-/media/GatherContent/Test-resources-page/Additional-Documents/RIBASustainableOutcomesGuide2019pdf.pdf>

¹³ https://www.london.gov.uk/sites/default/files/design_for_a_circular_economy_primer_ggbd_web2.pdf

3. Sustainability and Energy Strategy

3.1 Introduction

This chapter summarises the various sustainability, energy and climate change measures that are proposed for the development of the high quality landmark residential building.

It follows the topic headings of Chapter 4 'Environmental Standards' of the Guide to Development in Manchester SPD (2007) as follows:

- Energy efficiency (incorporating renewable energy);
- Environmental design;
- Water management & weather resilience;
- Waste management;
- Construction management;
- Waterways.

3.2 Energy Efficiency

Minimising GHG emissions is key to mitigating the effects of development on climate change.

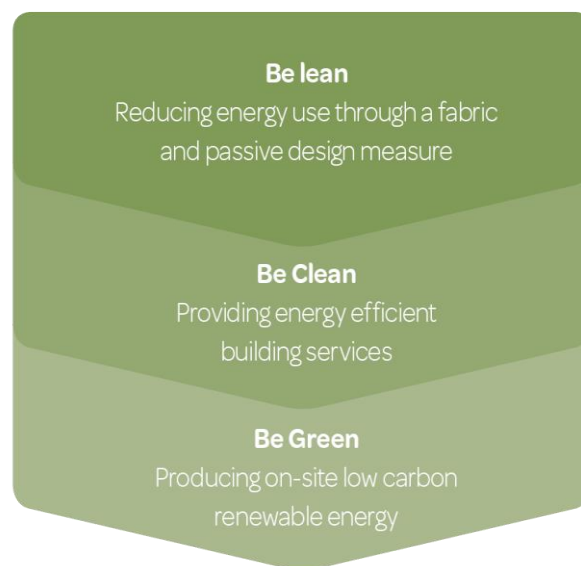
A key aspect of the future regulations is related to the continuing decarbonisation of the national electricity network. The phasing out of coal fired power stations and increasing generation of energy from renewable sources is rapidly reducing the carbon intensity of the electricity network.

Through decarbonisation of the national electricity grid and introduction of the new SAP10 carbon factors within the Building Regulations update anticipated in 2021, electric heating systems are expected to deliver a higher carbon saving than gas alternatives.

Taking these considerations into account the development aims to reduce energy consumption and carbon emissions in accordance with the

energy hierarchy (**Figure 3**) and anticipated future energy and carbon standards.

Figure 3: The Energy Hierarchy



King Associates has undertaken an Energy Strategy (**Appendix 1**) to determine the most suitable and efficient building services strategy. The following sections set out the proposed measures incorporated within the design to deliver an energy efficient, low carbon development.

3.2.1 Be Lean – Reducing Energy Use

Central to the delivery of low carbon and energy efficient buildings is the 'fabric first' principle which recognises the most effective way of minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This 'fabric first' approach has a number of distinct benefits including:

- Carbon savings delivered are 'locked-in' for the lifetime of the building (60 years or more) rather than the much shorter lifespan (around 25 years) of a renewable energy technology;
- Virtually no maintenance and/or replacement costs to maintain carbon reductions through improved fabric;
- No reliance on an occupier's behaviour to deliver carbon reductions. Achieving carbon savings from renewable energy technologies require education, awareness and often, behavioural changes from occupants.

The following measures implemented within the design of the residential building to reduce energy use and carbon emissions:

- Specification of thermal insulation and air permeability standards to exceed the minimum standards contained within Part L 2013;
- Incorporating high efficiency lighting targeting 100% of all light fittings as LED;
- Mechanical Heat Recovery Ventilation (MVHR);
- Use of smart space heating controls including integrated programmer and thermostat; and,
- Waste Water Heat Recovery (WWHR).

The design of the proposed development will exceed the requirements of the current Building Regulations through a range of enhanced fabric and energy efficiency measures.

3.2.2 Be Clean – Efficient Energy

The next stage of the energy hierarchy is the provision of energy efficiently, i.e. from a decentralised energy system such as a Heat Network.

District Heating Networks (DHN) comprise a centralised heat generator, typically a gas fired Combined Heat and Power (CHP) engine. CHP

systems generate electricity and waste heat which can be fed into a network of insulated pipes which deliver low carbon heat to buildings to provide heating and hot water via individual heat transfer units.

As summarised earlier, the continued decarbonisation of the national electricity network and anticipated changes to the Building Regulations mean that the carbon emission benefits of traditional CHP systems will diminish during their life cycle.

Furthermore, an all-electric building services strategy as proposed will not adversely affect the local air quality in Manchester, as there will be no on-site combustion.

CHP and DHN are therefore not considered further as carbon emissions associated with electricity are expected to continue to reduce as the grid decarbonises, leading to greater savings in carbon emissions over the life time of the development.

3.2.3 Be Green – Low Carbon Renewable Energy

The final stage of the energy hierarchy is the generation of on-site low carbon renewable energy.

A review of potential low carbon renewable energy technologies which may be suitable for inclusion in the building's design has been completed, in order to inform the detailed design of the building. A summary of technologies reviewed is provided below.

Wind Turbines

Wind turbines have been ruled out for this development as they would not be feasible in the city centre location.

Solar Photovoltaics (PV)

Solar photovoltaic (PV) systems generate zero carbon electricity from sunlight and are well suited to most developments, particularly where the electricity load is high and consistent during

daylight hours. Furthermore, they require minimal maintenance once installed.

Solar PV could be appropriate for this development, however roof space is limited due to the incorporation of residential amenity space.

Solar Thermal

Solar thermal systems generate zero carbon hot water from sunlight in a similar manner to Solar PV. They require insulated tanks to store the hot water and have greater maintenance demands than solar PV given the need to ensure anti-freeze in the pipework is topped up every few years.

Solar thermal could provide a saving in electricity and reduction in carbon emissions, however as confirmed for solar PV above, roof space is limited.

Heat Pumps

Heat pumps provide low carbon heat sourced either from the ground (Ground Source Heat Pumps - GSHP) or air (Air Source Heat Pumps - ASHP). They require mains electricity to operate but typically generate at around three units of heat for every unit of electricity that is consumed.

The limited footprint of the site means that GSHPs are not feasible, however ASHPs have been incorporated as part of the all-electric building services strategy to deliver a further saving in carbon emissions.

Biomass

Biomass provides useable heat from a range of solid fuels including wood and straw. The installation of a biomass boiler, flue and associated fuel store require significant space and regular deliveries, and is therefore not considered appropriate for the development. Furthermore, there would be a negative impact on local air quality should a system with onsite combustion be installed.

3.2.4 Energy Strategy Summary

Table 2 demonstrates the anticipated energy performance of the development, and carbon

reduction achieved, as modelled by King Associates. The Target Emission Rate and Dwelling Emission Rate have been calculated as an average across 61 residential unit types.

Table 2: Energy Modelling Results (SAP2012)

Parameter	Performance
Average Target Emission Rate (TER) kgCO ₂ /m ² /year	22.78
Average Dwelling Emission Rate (DER) kgCO ₂ /m ² /year	20.73
Average CO₂ Improvement (%)	9%

As shown within **Table 2**, the development achieves a circa 9% reduction in carbon emissions from Part L 2013 requirements through building fabric improvements and incorporation of a highly efficient building services strategy which includes ASHPs, MVHR and WWHR. This reduction exceeds the requirements of Policy EN6.

However, the 'true' carbon reduction achieved will be higher given that Part L 2013 compliance is calculated using outdated SAP2012 carbon factors.

The proposed SAP10 carbon factors show the decarbonisation of grid electricity, and are used within the Greater London Authority to determine the realistic energy performance of buildings. These carbon factors will also be utilised in the upcoming changes to Part L, expected later this year. King Associates have therefore modelled the development using SAP10 carbon factors, to demonstrate a more realistic performance. The results of this are shown in **Table 3** overleaf.

Table 3: Energy Modelling Results (SAP10)

Parameter	Performance
Average Target Emission Rate (TER) kgCO ₂ /m ² /year	20.91
Average Dwelling Emission Rate (DER) kgCO ₂ /m ² /year	9.41
Average CO₂ Improvement (%)	55%

The difference in the two TER parameters shown in Tables 2 & 3 clearly demonstrate that the SAP2012 carbon factors are no longer fit for purpose, and that Renaissance is an extremely energy efficient development.

The proposed energy strategy is further future-proofed by being ‘all electric’, and will benefit from the significant further decarbonisation of the UK electricity grid that is forecast by Government. Therefore the development will contribute to Manchester City Council’s ambition to become carbon neutral by 2038.

In addition to the low carbon energy strategy, the location of the site provides an opportunity to maximise sustainable travel options including walking / cycling and public transport in preference to the private car. This approach will deliver further carbon emission reductions whilst promoting the health and wellbeing of building occupants.

A total of 36 car parking spaces will be provided as part of the development, of which 20% will contain 7kW minimum Electric Vehicle (EV) charging points to encourage take up of Ultra Low Emission Vehicles (ULEVs). Cycle parking will be provided at a 1:1 ratio for residents, with 300 secure spaces provided at Floor Level -1.

3.3 Environmental Design

Policy DM1 states that new residential development from the year 2016 onwards should achieve Code for Sustainable Homes Level 6. The Code for Sustainable Homes was withdrawn in 2015 and so this does not apply to the Renaissance development.

Instead, the proposed development will comply with policies of the Core Strategy, as detailed within the remainder of this Section. Furthermore environmental design principles such as circular economy and lean building design, to reduce environmental impact of the development, are summarised within **Chapter 4**.

3.4 Water Management & Weather Resilience

Water management and weather resilience issues in new development are becoming increasingly important as a result of climate change, with effects such as increased winter rainfall, decreased summer rainfall and increased summer temperatures already being experienced.

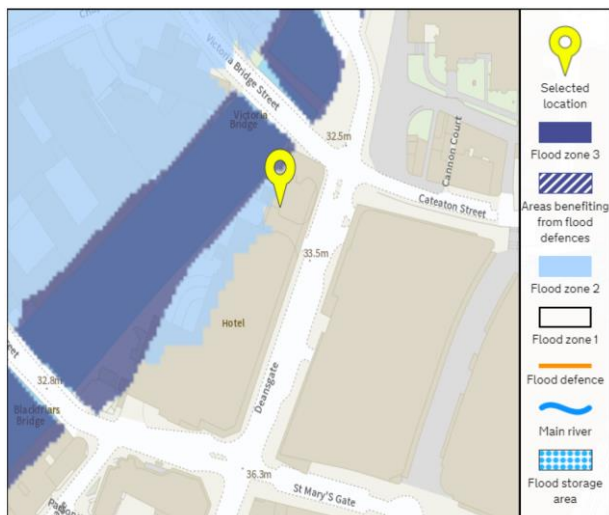
The Met Office’s latest UK Climate Projections (UKCP18)¹⁴ include significant changes to climatic conditions in Manchester by the 2050s, including increased summer and annual temperatures, increased winter rainfall and reduced summer rainfall.

3.4.1 Flood Risk & Drainage

Historically, the Strategic Flood Risk Assessment produced for Manchester in 2010 identified the site as being located within Flood Zone 2 and 3, due to the proximity of the River Irwell which forms the western boundary of the site. The Environment Agency maps, which are updated on a regular basis, indicate that the development is within Flood Zone 1, 2 and 3, as shown in **Figure 4**.

¹⁴ <https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf>

Figure 4 EA Flood Map [Shepherd Gilmour]



A **Flood Risk Assessment (FRA)** has been prepared by Shepherd Gilmour Consulting Engineers for the proposed development. The FRA clarifies that the site is considered at high risk of fluvial flooding i.e. Flood Zone 3, which is land having a 1 in 100 or greater annual probability of river flooding.

The use of the proposed development as residential dwellings classifies the development as vulnerable to fluvial flooding, principally due to proposed residential dwellings located on the lowest basement level. The finished floor levels of the proposed development are required to be set at least 600mm above the estimated 1 in 100-year flood event level with an allowance for climate change. The EA guidelines dictate that the climate change allowance for residential dwellings is the 'Upper End', equating to a 70% allowance for climate change.

During extreme events, the lower basement level would be affected, however Deansgate, Blackfriars, Victoria Bridge Street and the above floors would provide safe refuge during this event. It is recommended that further consideration to remove residential development at the basement level is investigated. This will reduce the vulnerability of the development and reduce finished floor levels, as it will benefit from a reduction in the climate change allowance to 35%.

The proposed site is at low to very low risk of pluvial flooding. The proposed drainage system will

not contribute to any flood risk elsewhere, and therefore runoff rates generated by the proposed development will provide betterment over the existing conditions. Due to the location of the development site within the Critical Drainage Area, the proposed surface water runoff rate should be reduced to 50% of the existing rate. The surface water design will include a climate change allowance of 20% which will be checked against the 'Upper' climate change allowance of 40%. Any residual risk will be managed onsite with the use of appropriate drainage and/or consideration of topographical level.

The FRA also considers flood risk from canals and groundwater which concludes very low or negligible risk to the development site. There is a medium risk of reservoir flooding in the event of a potential breach, but this is considered very unlikely and therefore no further mitigation measures are proposed.

3.4.2 Potable Water Efficiency

Potable water is an increasingly important natural resource and with the majority of the UK classed as being in an area of moderate or severe water stress the conservation of water is becoming a more significant sustainability metric.

The new development will aim to reduce water consumption through a range of water efficiency measures such as:

- WCs with reduced flush volumes;
- Taps and showers with limited flow rates;
- Where appropriate, water efficient domestic equipment; and,
- Water meters.

Through the use of these measures the development will target a water consumption rate of 125 litres per person per day (l/p/d), in line with current Building Regulations.

Furthermore, soft landscaping will be reliant on rainwater or manual watering only.

These measures will help ensure the development reduces demand on local potable water supplies and therefore promote resilience to potential water constraints such as summer droughts.

3.4.3 Building Overheating Risk

Overheating of the development has been limited through careful specification of u-values and glazing g-values, and external shading. Energy modelling undertaken so far show the development passes the 'risk of overheating' analysis defined by the SAP energy modelling.

3.5 Waste Management

Regarding operational waste, sufficient storage for recyclable and non-recyclable waste will be provided in accordance with Manchester City Council's Waste Storage & Collection Guidance for New Developments GD04 (Version 6, September 2017)¹⁵. This guidance provides minimum standards for the storage and collection of refuse and for recycling facilities in new domestic and commercial development.

Waste storage facilities provided at Renaissance will reflect the various waste streams that are generated, and collected by the local waste authority. By making it clear and convenient for building users to separate waste at source, a reduction of waste sent to landfill will be encouraged.

3.6 Construction Management

The proposed development will ensure that construction is undertaken in a way which minimises waste and impact on the surrounding area. The main contractor will register with the Considerate Constructors Scheme and target a score of at least 4.5 stars to achieve compliance significantly beyond best practice.

Chapter 4 outlines measures that the Applicants have taken to implement circular economy principles, through commitments made and measures taken throughout design and

construction. The chapter includes details with respect to material and waste minimisation, use of sustainable materials, and protection of natural resource.

3.7 Biodiversity

Penny Anderson Associates has undertaken an extended Phase 1 Habitat Survey and building inspection for roosting bats. The assessment was conducted during the appropriate season for these types of survey and the results are representative of the site before the commencement of initial site preparation.

The wider site is dominated by the existing buildings, with no features of significant nature conservation interest. The plant species on site were limited to species that are common and typical of early successional communities of urban sites at the time of the survey.

An evening bat survey confirmed that there were no roosting bats present on site. Furthermore, no active or disused birds' nests were observed during the survey. The site was not considered suitable for use by nesting black redstart as there were no sheltered, high ledges for nesting.

The ecologist has recommended enhancement measures to be incorporated into the design of the wider site, these include:

- Use of native and wildlife attracting planting;
- Inclusion of bat roosting features;
- Maintaining high level areas for use as song posts for breeding black redstarts; and,
- Incorporation of bird nest boxes where possible.

A private garden for residents will be provided, incorporating green infrastructure such as amenity planting, shrubs and a variety of multi-stem and single-stem trees at ground level. A number of roof terraces have also been proposed, with the Level

¹⁵ https://www.manchester.gov.uk/downloads/download/6048/waste_management_strategy

14 terrace incorporating planting such as herbaceous species, hedges and small trees.

Furthermore, planting of new trees is proposed, which will exceed the requirement within Chapter 4 of the SPD to achieve a 10% net gain in tree planting across the site.

The landscaping proposals will therefore aim to enhance biodiversity on site, provide green amenity at ground level, and create new habitats for local priority species.

3.8 Waterways

The closest watercourse to the site is the River Irwell which also forms part of the Manchester Ship Canal. The river is located on the western boundary of the site.

Furthermore, there is a culverted watercourse identified within Cateaton Street that has been identified within the FRA as having the potential to encroach into the development boundary. Further investigations will be undertaken on this watercourse to determine its impacts on the site, and any impacts site activities may have on it.

A Construction Environmental Management Plan (CEMP) will be developed to ensure that measures are in place to reduce water pollution in line with best practice.

4. Circular Economy – a Whole Life Approach

4.1 Introduction

A circular economy is one where materials are retained in use at their highest value for as long as possible and are then re-used or recycled, leaving a minimum of residual waste. A circular economy will save resources, increase the resource efficiency of businesses and projects, and help to reduce carbon emissions.

For circular principles to be successful, a whole building lifecycle approach is required. Furthermore, the goals of the circular economy statement are closely entwined with the approach of other sustainability measures of the proposed development as discussed within **Chapter 3**.

The strategy of the Renaissance development will incorporate a number of commitments to manage quantities of materials, resources and waste. These principles underpin the structure and content requirements of this circular economy statement.

4.2 National and Local Guidance

4.2.1 UKGBC Circular Economy Guidance

This UK Green Building Council guidance¹⁶ is designed to enable construction clients to include more ambitious circular design and construction principles for non-domestic built assets. In general, the principles are also transferrable to domestic and infrastructure scenarios.

In contrast to a linear “take-make-dispose” economy, a circular economy builds overall system health by decoupling economic activity from the consumption of finite resources. This approach should be underpinned by a transition towards renewable energy sources.

The structure of the UKGBC Guidance follows the following Circular Principles:

- Reuse
- Design Buildings for Optimisation
- Standardisation or Modularisation
- Servitisation and Leasing; and,
- Design and Construct Responsibly.

The guidance also aims to ensure that the construction supply chain can effectively deliver circular economy goals and that budget, project management, and timescale risks are minimised and mitigated.

4.2.2 Our Waste, Our Resources: A Strategy for England

The Strategy for England (2018)¹⁷ sets out Government proposals to preserve our stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy (see **Figure 5** overleaf).

The Strategy aims to make England a world leader in using resources efficiently and reducing the amount of waste created. By prolonging the lives of materials and goods, society can move away from the inefficient ‘linear’ economic model of ‘take, make, use, throw’ towards a more circular economy through which resources will be in use as long as possible so that maximum value can be extracted from them.

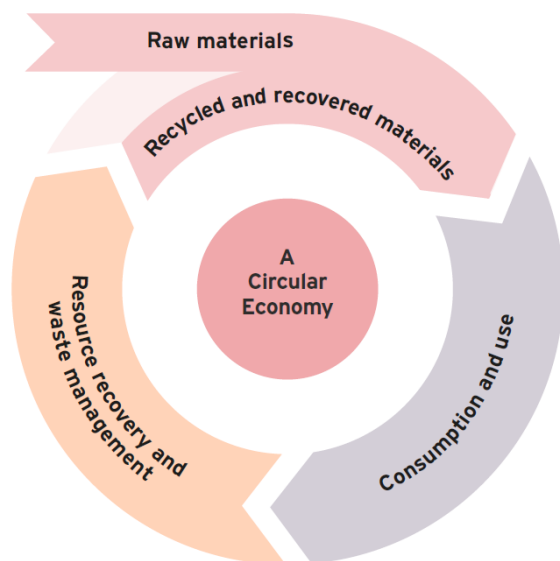
The Strategy is framed by natural capital thinking and guided by two overarching objectives:

- To maximise the value of resource use; and
- To minimise waste and its impact on the environment.

¹⁶ <https://www.ukgbc.org/wp-content/uploads/2019/04/Circular-Economy-Report.pdf>

¹⁷ [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.p](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf)

Figure 5: Circular Economy [Waste Strategy for England]



4.2.3 Local Guidance

As outlined within **Section 2.2.1**, Manchester City Council's Core Strategy has two key policies relating to waste and the practice of circular economy. These are Policies EN19 and DM1.

Furthermore Places for Everyone includes a policy (JP S7 Resource Efficiency) which required the consideration of circular economy principles.

During pre-application discussions, Manchester City Council requested the production of a Sustainability and Circular Economy Statement, which should detail at a high level the strategy for the approach to whole life carbon within the development.

4.2.4 Guidance from the Greater London Authority

The requirement for a Circular Economy Statement from Manchester City Council at pre-app stage referenced the Greater London Authority Circular Economy Statement Guidance¹⁸.

This guidance sets out the requirements at different stages for the topic area. The core principles of the Guidance document are:

- Conserve resources, increase efficiency and source sustainably
- Design to eliminate waste (and for ease of maintenance)
- Manage waste sustainably and at the highest value.

Each of these principles incorporate a number of commitments to manage quantities of materials, resources and waste.

4.2.5 Policy and Guidance Summary

The national principles and guidance, and Policies EN19 and DM1 of the adopted Manchester Core Strategy, along with the development of Places for Everyone, demonstrates the ambition to move to a circular economy.

The Applicants wish to demonstrate the clear commitment to designing and building a development which considers the impacts of circularity in relation to materials and waste.

4.3 Proposed Approach

This section outlines the proposed approach taken by the Applicants and project team so far, to engage in the principles of circular economy and ensure a whole life approach. The approach taken follows the core principles outlined within **Section 4.2.1** and the principles set out in the London Plan which has set out a practical approach to considering circular economy for new development proposals.

The following sections set out a number of commitments, with detail on how these can be achieved, as well as measures already taken to achieve them. Once the project moves into detailed design, and a contractor is appointed, the project team will work together to monitor and expand on these commitments where possible.

¹⁸<https://consult.london.gov.uk/circular-economy-statements>

4.3.1 Conserve resources, increase efficiency and source sustainably

Commitment 1: Minimise quantities of material used, and therefore minimise embodied carbon

From project conception, there was a clear priority made by the Applicants and project team to deliver a sustainable resource efficient masterplan at the Renaissance site. Therefore, the decision was made to retain the structure of the Renaissance Hotel and Premier House, and to prioritise refurbishment over demolition. One clear benefit of this was to reduce carbon emissions associated with construction materials. This approach compares with other masterplans proposed for the site, which involved full demolition and rebuild.

‘Embodied carbon’ is the greenhouse gas (GHG) emissions caused by the extraction, manufacture/processing, transportation and assembly of each construction product and material in a building. It is estimated that embodied carbon can contribute up to 70%¹⁹ of a building’s total lifetime carbon, therefore potentially contributing to climate change significantly more than operational carbon.

As such, the Renaissance masterplan is a sustainable and resource-efficient approach which will significantly reduce carbon emissions relative to an entirely new build development.

Furthermore, the structural design of the residential building has been optimised to reduce the quantum of concrete used on site. Upper floor slabs will be post-tensioned, which means they will be pre-stressed to achieve a high level of strength. The pre-stressing process ensures that the thickness and therefore quantum of concrete at each floor level can be reduced, leading to a saving in embodied carbon.

Partial demolition of Premier House will be required for the development. Any re-use of materials from the demolition such as existing

foundations, concrete and steel will be prioritised to minimise use of virgin material.

Commitment 2: Minimise quantities of other resources used

The proposed development makes use of previously developed land, protecting virgin land and minimising disruption to the existing landscape.

During construction, the use of energy, water and fuel associated with transport of materials and waste will be monitored and reduced where possible. Key performance indicators (KPIs) will be developed with the contractor to monitor performance against this commitment. Examples of measures to reduce construction site resources could include the use of green diesel within site machinery, and providing training to the construction workforce to limit electricity and water usage within site cabins.

No fossil fuels will be used during the operation of the residential building, as it is employing an all-electric building service strategy to benefit from ongoing national grid decarbonisation through use of renewable resources. Please see **Section 3.2** for further details.

Furthermore, sustainable travel options to provide an alternative to private car travel have been incorporated into the design. These measures include provision of cycle storage and facilities.

Commitment 3: Specify and source materials and other resources responsibly and sustainably

The contractors will be encouraged to procure materials from suppliers with responsible sourcing accreditation, and products with Environmental Product Declarations (EPDs). Furthermore, local material suppliers will be prioritised.

Several materials have been considered for the hard landscaping of the wider masterplan, such as natural stone from a local quarry e.g. Scoutmoor,

¹⁹ UK Green Building Council: Tackling Embodied Carbon in Buildings (February 2015)

natural stone from China, tarmac and concrete pavers. Despite having a higher capital cost, Yorkstone from Scoutmoor has been chosen as it provides a carbon saving of approximately 184 tonnes compared with the equivalent from China. Sourcing natural stone from local suppliers not only reduces carbon associated with transport, it also supports local businesses in Greater Manchester, something the Applicants are keen to promote.

The Applicants endeavour to reduce the reliance on raw virgin materials and procure from sustainable sources. Therefore, recycled content will be specified where possible.

An effective way to reduce virgin materials, and therefore reduce embodied carbon emissions in new build development is to incorporate cement alternatives within the cement mix. Although it is not possible to incorporate cement alternative into the upper floor slabs due to their pre-stressed nature (which in itself reduces the amount of concrete used on-site), an allowance for Ground Granulated Blast-furnace Slag (GGBS) has been made for the raft slab. GGBS is a by-product of iron making, and can be used as a direct replacement to Portland cement, which is a virgin material. It is anticipated that a proportion of the cement can be replaced with GGBS, producing a significant reduction in construction carbon.

The use of steel has been minimised in the design of the building, however steel with high levels of recycled content will be used where possible.

4.3.2 Design to eliminate waste (and for ease of maintenance)

Commitment 4: Design for longevity, adaptability or flexibility and reusability or recoverability

In order to ensure that circular economy principles are embedded within the construction process, the aim of the development is to meet long term needs while being durable and resilient. It should be able to cope with change from, for example, climate change or different ways of living.

Material specifications and procurement will aim to achieve durability standards. Materials are to be demountable and recyclable where practicable. Off-site prefabrication and design for modularisation / standardisation will be promoted and maximised where possible to ensure ease of maintenance and repair/replacement during operation.

Commitment 5: Design out construction, demolition, excavation, industrial and municipal waste arising

Demolition, construction and excavation waste has been designed out as far as possible in the Renaissance masterplan, through the retention of the Renaissance and Premier House structures. Partial demolition is required to make way for the proposed residential development and as noted where possible opportunities for reusing materials will be explored

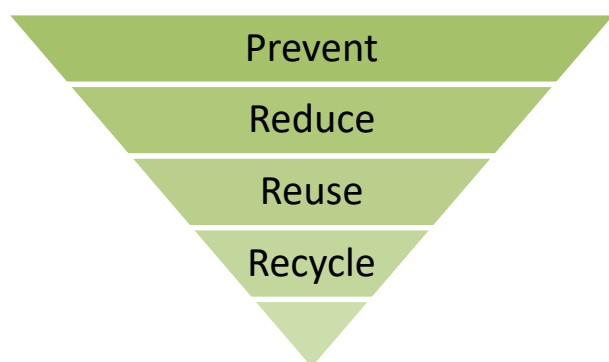
Modern methods of construction will be considered to minimise waste associated with packaging, offcuts and re-work.

4.3.3 Manage waste sustainably and at the highest value.

Commitment 6. Manage demolition and construction waste

The partial demolition and strip out of the vacant office in dilapidated condition provides opportunity for the reuse of materials on site. A pre-demolition and refurbishment audit will be undertaken to ascertain what materials are available for reuse. The audit will consider the waste hierarchy (**Figure 6**), and where materials are unsuitable for reuse on-site, they will be considered for reuse off-site, before being recycled in the at appropriate licensed facilities.

Figure 6: The Waste Hierarchy



Some excavation will be required to allow for the residential development's foundations. It is unlikely that this material can be retained on site, therefore the contractor will be encouraged to follow the waste hierarchy for disposal, prioritising re-use off site at local construction projects where possible.

During construction, the team will work together to minimise waste generation, and waste to landfill, with innovative solutions encouraged by the Applicants.

The following targets are proposed to reduce construction waste produced and sent to landfill:

- Aim to divert 95% of waste from landfill; and,
- Aim for a waste generation target of less than 13.3m³ or 11.1 tonnes of waste produced per 100m² of gross internal area.

These proposed targets will need to be confirmed with the contractor once appointed.

Specific procedures for the minimisation, segregation and disposal of waste will be set out within a Site Waste Management Plan (SWMP).

Monthly environmental inspections will take place and KPIs will be monitored. The KPIs will include waste generation, segregation and diversion from landfill.

Commitment 7. Manage municipal waste

An adequately sized refuse store has been incorporated into the ground floor of the development proposals. The provision of waste

storage aligns with Manchester City Council's Waste Storage & Collection Guidance for New Developments GD04.

The Applicants will consider ways to work with the building occupants to encourage recycling and operational waste minimisation.

4.4 Summary

This Chapter has set out the proposed approach that the Applicants have taken to ensure that the principles of circular economy have been at the forefront of the design and construction.

Initial commitments have been set out in line with London Plan guidance as requested by Manchester City Council, and will be expanded and monitored throughout detailed design and construction. Key measures identified so far to achieve circular economy include:

- Retention of Renaissance Hotel and Premier House, avoiding unnecessary demolition and new build within the masterplan;
- Use of post-tensioned upper floor slabs, reducing the overall quantum of concrete required;
- Specification of cement alternative within the concrete raft slab where possible;
- Re-use of materials from the demolition and excavation where possible;
- Specification of Yorkstone from Scoutmoor, saving embodied carbon and supporting the local economy;
- Monitoring the use of energy, water and vehicle fuel on site;
- Encourage the procurement of sustainable, responsibly sourced, low carbon materials;
- A durable building design, which minimises the need for material replacement over its life;
- Production of a SWMP to set out waste minimisation and diversion from landfill procedures;
- An aim to divert 95% of waste from landfill;

- A waste generation target of less than 13.3m³ or 11.1 tonnes of waste produced per 100m² of gross internal area; and,
- Provision of an appropriately sized waste store to manage municipal waste.

5. Conclusion

This Environmental Standards and Circular Economy Statement has been prepared to demonstrate how the proposed high quality, landmark residential development responds positively to national and local sustainable policy requirements.

The development aims to provide a range of sustainability benefits to Manchester City Centre, through redevelopment of an important brownfield land resource which is long term vacant and an eyesore.

Energy Efficiency and Carbon Reduction

The proposed energy strategy comprises a 'fabric first' approach in accordance with the energy hierarchy, together with air source heat pumps to deliver low carbon heating.

An overall CO₂ improvement beyond Part L 2013 of circa 55% is predicted when taking into account SAP10 carbon factors, which goes well beyond Manchester City Council's minimum policy and validation checklist requirements (circa 9% and 20% CO₂ improvement on Part L 2013 respectively).

Furthermore, this proposed 'all electric' energy strategy future-proofs the proposals by avoiding being locked in to higher carbon mains gas. As a result, operational carbon emissions will reduce

year-on-year from the significant ongoing decarbonisation of the UK electricity grid that is forecast by Government up to the year 2100. The development will therefore make an appropriate contribution to the decarbonisation targets of the UK and Greater Manchester.

Furthermore the development benefits from excellent public transport links and local amenities, encouraging active travel in the form of walking and cycling, whilst providing cycle storage at a 1:1 ratio for residents. EV charging points will be installed to 20% of the car parking spaces provided as part of the development, to encourage use of ULEVs.

Water Management and Weather Resilience

Residential dwellings are considered of high vulnerability to fluvial flooding, predominantly due to the placement of residential development on the lower basement level. Mitigation measures to reduce the risk of fluvial flooding to the development include ensuring the finished floor level of the proposed development is set above the estimated 1 in 100-year flood event level with a 70% allowance for climate change.

The proposed surface water drainage system will not contribute to offsite flood risk, and any residual risk will be effectively managed onsite by the drainage system design.

Water efficiency will be managed through limiting sanitary fittings and ensuring that no mechanical irrigation will be provided within the development.

Construction and Waste Management

The proposed development will ensure that construction is undertaken in a way which minimises waste and impact on the surrounding area, including a target of at least 4.5 stars using the Considerate Constructors Scheme.

Construction phase waste management and appropriate operational waste storage will help ensure the development contributes to waste recycling targets and minimises the amount of waste sent to landfill.

Circular Economy

Chapter 4 demonstrates how the Applicants and design team have considered and incorporated the principles of circular economy into the design. The reuse of a brownfield site and retention of buildings within the masterplan is inherently sustainable, and measures specific to the residential building include:

- Lean design, reducing the quantum of materials produced and brought to site, including use of pre-stressed concrete; and,
- Use of sustainable, low carbon materials such as cement replacement within concrete mixes.

Biodiversity

The proposed development reuses a vacant and dilapidated brownfield land in a central location in Manchester.

The ecological value of the site is limited, and is dominated by the existing buildings, with no features of significant nature conservation interest. Therefore biodiversity enhancement will be made directly on site, incorporating a number of measures into the design such as native and wildlife attracting plant; inclusion of bat roosting features; high level areas for breeding black redstarts; and bird nest boxes where possible.

Furthermore, a private ground floor resident's garden and terraces will improve the green infrastructure at the site, with tree replacement exceeding the 10% net gain requirement, as required within the Guide to Development SPD.

Waterways

The closest watercourse to the site is the River Irwell which also forms part of the Manchester Ship Canal. Furthermore, there is a culverted watercourse identified within Cateaton Street.

A Construction Environmental Management Plan (CEMP) will be developed to ensure that measures are in place to reduce water pollution in line with best practice.

The joint venture between PAG and SCG is committed to the delivery of a sustainable, high quality residential development which provides visual improvement to a key city centre site, and supports Manchester's aim to become net zero carbon by 2038.

Appendix 1 – Energy Strategy



Renaissance

Residential Development Planning Report Energy Strategy Statement

4 Jordan Street

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Submitted and Prepared by:

Project number: 3330-KIN-B2-ES-RP-001

Issue: T1

Date: 25.10.2021



Document History

Issue	Date	Purpose	Author
P1	13/08/2021	Preliminary	Craig Woods
P2	08/09/2021	Revised Incorporating comments	Craig Woods
T1	29/10/2021	Revised Incorporating comments	Craig Woods

Approvals

This document requires the following approvals.
Signed approval forms are filed in the Management section of the project files.

Name	Signature	Title	Date of Issue	Version
Paul Aspden	P. Aspden	Partner	13/08/2021	P1
Paul Aspden	P. Aspden	Partner	09/09/2021	P2
Paul Aspden	P. Aspden	Partner	29/10/2021	T1

Distribution

Name	Organisation	Role
Fiona Lomas-Holt	Turley	Planning/Sustainability



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1.0 Introduction

The following statement outlines the energy and climate change strategy for the proposed Residential development at Renaissance, the site is bounded by Blackfriars St, Deansgate, Victoria Bridge St, and the River Irwell.

The development is a residential scheme with circa. 300 dwellings with amenity and retail accommodation.

This outline statement has been prepared to demonstrate that the Renaissance residential development meets the requirements of Part L1A of the English Building Regulations 2013 and the Manchester City Council Climate Change Action Plan, which sets a commitment to reduce CO₂ emissions by at least 50% by 2025, via a 13% year on year reduction from buildings.

Additionally, this approach reviews the opportunities for passive design measures, energy efficiency measures and feasible low and zero carbon technologies, in keeping with an 'Energy Hierarchy' approach. Building Regulations Part L is used as the assessment methodology in determining CO₂ emissions.



2.0 Study Area

Sample plots of differing orientations and sizes were assessed using the Standard Assessment Procedure (SAP) to show the predicted compliance of this development, based on a calculated area weighted average.

Passive design, which aims to improve the fabric of the development, as well as energy efficient measures, will be investigated to reduce the overall energy demand within the development, with the 'best case' parameters being established.



3.0 Legislative Policy and Good Practice

The current legislative framework sets out the requirement to comply with Part L1A of the English Building Regulations 2013 and the Manchester City Council Climate Change Action Plan, which sets a commitment to reduce CO₂ emissions by at least 50% by 2025, via a 13% year on year reduction from buildings.

Manchester Core Strategy

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

CS Policy DM 1

Development Management requires all development to have regard to a number of development principles. Subject to scheme viability, developers will 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 (CfSH) standard. It should be noted that the CfSH is no longer accepted as an assessment methodology for domestic properties and has been withdrawn.

CS Policy EN 4

Reducing CO₂ 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 through the use of low or zero carbon energy generating technologies.

CS Policy EN 6

Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies requires applications for residential development of 10 or more units and all other development over 1,000m² to meet, as a minimum, the targets shown in the tables below, unless unviable.

Target	% Minimum Requirements
Target One: Network development area	CHP/District heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target Two: Electricity intense buildings	+15% increase on Part L 2010
Target Three: Micro generation area	+15% increase on Part L 2010

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 CO₂



emission reductions for the residential and non-domestic elements of this scheme are presented below:

- Residential - 9% dwelling emission rate reduction over Part L 2013; and,
- Non-domestic - 6% dwelling emission rate reduction over Part L 2013.

Climate Emergency

A Climate Emergency was declared by Manchester City Council on the 10th July 2019 in response to the findings of the Intergovernmental Panel on Climate Change (IPCC) report. The City Council believe that there is serious risk to Manchester's people of climate change affecting economic, social and environmental well-being, supply chains – including food security, financial systems and local weather, among many others. Therefore, the target for becoming a zero-carbon city has been accelerated by 12 years, setting 2038 as the new target for the city. The council has agreed the following:

- To deliver the 2038 target and determine if an earlier target can be possible.
- Encourage involvement in all wards by April 2020 through meetings as part of the Our Manchester strategy.
- Review all policies, processes and procedures to ensure the council can become carbon neutral. Present an action plan by March 2020 detailing how the city can stay within its carbon budget.
- Make climate breakdown and the environment, an integral part of activity throughout the council, including all decision making, ensuring key decisions take into account the impact on achieving the zero-carbon target.
- Investigate measures to ensure future procurement is carbon neutral. Increase the percentage of social value with an additional environmental element.
- Work with suppliers to green their supply chains and support local production.
- Investigate and introduce measures to help reach domestic zero carbon levels including addressing fuel poverty and retrofitting existing homes.
- Investigate ways to ensure that future local plans place a mandatory requirement for all new development to be net zero carbon by the earliest possible date.

Manchester Climate change Framework 2020 – 25

This document is Manchester's high-level strategy for meeting their commitment on climate change that builds on the Draft Manchester Zero Carbon Framework 2020-38, which was published in February 2019 and Manchester City Council's (MCC) declaration of a climate emergency in July 2019.

This was endorsed by MCC at the Executive meeting in March 2020 and will develop over the next five years, in line with changes in policy, climate science, rate of progress and other factors. The framework has set out four objectives to facilitate this:



Objective 1 – Staying within our carbon budgets : This requires taking action in the following relevant areas:

- Direct CO₂ emissions: staying within our 15 million tonne carbon budget for 2018-2100, including reducing the CO₂ emitted from our homes, workplaces and ground transport by at least 50% during 2020-25.
- Indirect CO₂ emissions: understanding and taking action on the things that we consume and which generate greenhouse gases through their production, transportation and disposal.

Objective 2 – Climate adaptation and resilience : will require the adaption of the city's buildings, infrastructure and natural environment to the changing climate and increasing the climate resilience of our residents and organisations. This includes:

- Increase the amount of urban green infrastructure cover, aiming for a 10% increase by 2038 from 2018 levels, in line with the Greater Manchester aim.
- Respond to these risks by incorporating adaptation and resilience within our plans and strategies, and acting to make necessary changes to our buildings, infrastructure and our natural environment.

Objective 3 – Health and wellbeing : aims to improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO₂ reduction and adaption and resilience:

- Adapt the city's built and natural environment and prepare our residents to become more resilient to these changes. Increasing the amount and quality of green space to enable residents to benefit from the improved physical and mental health that will come as a result.
- Improving the energy efficiency of the city's homes and providing access to affordable, secure supplies of renewable energy are essential help get 38,000 Manchester households out of fuel poverty.

Objective 4 – Inclusive, zero carbon and climate resilient : economy looks to ensure that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.

Priority Areas

Six priority areas have been established in order to help meet the above objectives and include:

1. Buildings (existing and new)
2. Renewable energy
3. Transport and flying
4. Food
5. The things we buy and throw away
6. Green infrastructure and nature-based solutions



Urgent Actions Identified to Help Meet the Commitments:

- New Buildings – To ensure that new developments in the city do not eat into the limited carbon budgets and add to the already significant retrofit challenge. Developments need to be built and operated to zero carbon standards as soon as possible.
 - The ideal way to do this is through UK Government establishing a national zero carbon definition and methodology for its implementation, and for Manchester City Council to implement this standard as quickly as possible through the local planning system.
 - This should include applying zero carbon standards to all developments where the Council has additional influence, with a view to all new development needing to be zero carbon from 2023 at the latest.
- Renewable Energy – The National Grid has been decarbonising in recent years; we need this to continue but at an accelerated rate, with a view to being fully decarbonised as soon as possible.
 - At least 50% of all homes should have the equivalent of 16m² of solar PV panels by 2024.
- Gas – The following actions are needed to help reduce the reliance on natural gas:
 - Improve the energy efficiency of our buildings as far as possible to reduce our demand for gas.
 - Replace our natural gas-based heating systems with renewable energy-based heating technologies as soon as possible
 - Work with Government to ensure that moving to electricity-based heating systems is affordable and does not push even more people into fuel poverty

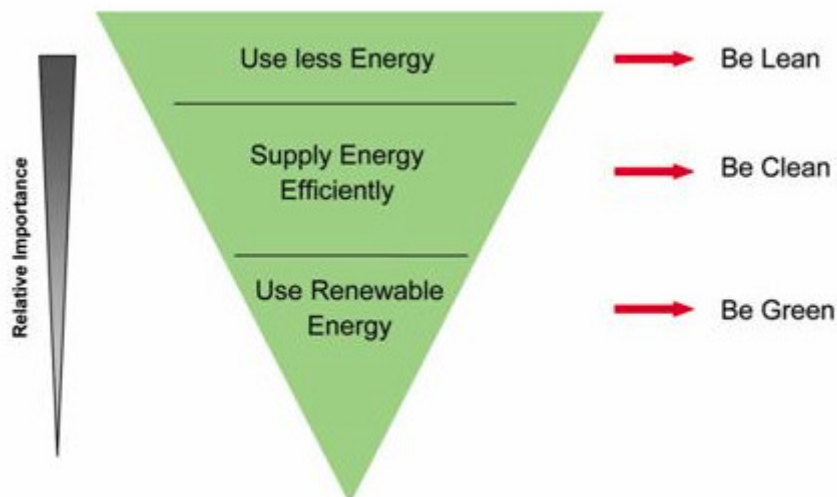


4.0 Energy Hierarchy

The development of the design will adopt a hierarchy approach to the design by looking at passive design methods to reduce energy and provide a high level of energy efficiency.

The Energy Hierarchy states that, in order to design an energy efficient development, the development must first be designed to use less energy through passive measures, such as improved fabric and glazing, low energy lighting and being more air tight. The second stage is to use 'Clean' energy, such as a CHP, Air Source Heat Pumps etc... The third and final stage is to assess whether other Low and Zero Carbon (LZC) technologies can be incorporated, such as Photovoltaic panels, solar thermal heating or wind turbines.

This design process will be followed throughout the design development.



4.1 Passive Design- Thermal Elements

To facilitate the development, the following elements have been considered through the design process from both an energy efficiency and thermal comfort perspective:

- Fabric insulation levels – balancing thermal performance and internal temperatures
- Building air permeability – this is a constraint due to the nature of the building
- Thermal mass – exploiting the properties of the constructions to benefit the internal environment
- Glazing strategy – optimising the use of the sun as a natural resource
- Ventilation strategy – optimising the use of heat recovery ventilation systems



4.2 Passive Design- Glazing, Daylighting and Solar Gain

There are three key criteria when considering the glazing strategy for the development. These are energy efficiency, natural daylighting factors and summertime internal temperatures. They are intrinsically linked and should be considered holistically to determine the optimum strategy to achieve a comfortable, productive and healthy environment in all weather conditions, whilst making best use of the sun as a natural heating source.

The main factors in optimising the above are the size, orientation and specification of the glazing in relation to the occupancy and usage patterns of the buildings.

Through the modelling exercise the effect of high external temperatures will be assessed and measures taken to minimise the heat gain and temperature rise within the building. Solar control finish applied to the glazing, secondary glazing, ventilation and free cooling, thermal massing strategies (e.g. leaving existing thermal mass exposed to exploit its properties) shall be considered to minimise the need for cooling, particularly within the Student Residential studios.

This strategy also has the benefit that the insulation will keep vital heat in during the colder winter months which will minimise the heat input required.

4.3 Future Homes Standard

It is intended that the Future Homes Standard will come into effect in 2025 with the objective of future proofing all new homes/dwellings, in England, with low carbon-heating systems and high levels of energy efficiency, albeit the final details of the standard are yet to be confirmed. With the second part of the two-part consultation process closing on 13th April 2021.



5.0 Energy Strategy

Below is the summary of the parameters which were inputted during the energy assessments.

The process of evaluating the most appropriate and effective energy strategy has considered a number of options, including but not limited to :

- Photovoltaic (PV) panels
- Solar Hot Water (SHW)
- Air Source Heat Pumps
- Waste Water Heat Recovery Systems
- Heat Pump Hot Water Cylinders
- Heat recovery ventilation systems (MVHR)
- High levels of thermal insulation
- Low air permeability
- Maximising solar control to mitigate overheating risks

The third and final iteration of the energy assessment keeps with the 'fabric first' approach, however, takes an alternative approach with minimising reliance upon Low and Zero Carbon technologies and improving the efficiency and operation of the heating, ventilation and hot water systems.

Fabric Parameters	
Thermal mass parameter	'Low' 250 kJ/m ² K
Terrain	Dense urban
Floors	0.13 W/m ² K
Walls	0.18 W/m ² K (including spandrel panels)
Roofs	0.13 W/m ² K
Windows	1.40 W/m ² K (frame included)
	0.32 g value
	BRFC Certified Glazing
Doors	n/a W/m ² K (corridors heated)
	Solid wooden door
Thermal bridging	Calculated (Accredited Construction Details)
Air permeability	3 m ³ /h.m ² @50Pa

System Parameters	
Mechanical ventilation	Mechanical Heat Recovery Ventilation (MVHR)
SFP	K+1 - 0.58 / 88%
	K+2 - 0.55 / 90%
	K+3 - 0.6 / 91%
Heat exchanger efficiency	min. 80% / max. 91%
Ductwork	Insulated
Space heating	Electric Panel Heaters



Heat distribution system	Pre-insulated low temp variable flow (post 1991)
Controls	Integrated Programmer and thermostat
Emitter	Electric Panel Heaters
Water heating	Self-contained Heat Pump Hot Water Cylinders (77no apartment) Direct Electric Water Heaters (all remaining apartments)
Plate heat exchanger	No
WWHRS	Yes
Water use	< 125 litres/person/day
Renewables	None
Lighting	Low energy throughout

5.1 Predicted Future Baseline (2021 and 2023)

The UK government completed the Consultation phase of a revision to the SAP methodology, SAP 10, however, this has not been implemented or passed into legislation.

Part of the revision to the SAP methodology is to reduction in the CO₂ emissions of grid supplied electricity by approximately 45%. This is due to the current and projected electricity generation from wind (both onshore and offshore), solar and nuclear and the reduction in the reliance upon natural gas and coal fired generation plant.

In addition to this the aspiration of Manchester City Councils Climate Change Action Plan would favour the electric air source heat pumps as this offers a significant improvement over Part L, using SAP 2012 methodologies and will take advantage of the reducing electricity grid CO₂ emissions intensity and will remove the combustion of fossil fuels in the city centre, thus reducing the localised carbon emissions resulting in improved air quality.

Revised Carbon Factors

The forthcoming changes and updates to Building Regulations, Approved Document Part L proposes to use SAP 10 as the mechanism to demonstrate compliance.

The carbon factors used in the current methodology, SAP 2012, for grid electricity generation are no longer representative of the current electricity grid decarbonisation. The proposed carbon factors are noted below for both grid electricity and natural gas.

Fuel	Assessment Methodology	Fuel Carbon Factor (kg.CO ₂ /kWh)
Natural Gas	SAP 2012 (current)	0.216
	SAP 10 (proposed)	0.210
Grid Electricity	SAP 2012 (current)	0.519
	SAP 10 (proposed)	0.233



The revised fuel carbon factors for grid electricity applied in the forthcoming SAP 10 are c.45% lower than those currently applied in SAP 2012 for building regulations compliance

This reduction in SAP 10 grid electricity fuel carbon factors will result in a reduced block average Carbon Emissions rate of 9.409 kg.CO₂/m² from 20.91 kg.CO₂/m². Which offers a significant progression towards meeting MCC's Climate Change Action Plan and carbon reduction in the city centre.



6.0 Appendix I – SAP Assessment Summary

Project: Renaissance, Manchester

Model Data:

Analysis Status:

Weatherfile:

Date:

		R1
Average TER		22.78
Average DER		20.73
% improvement over Part L		9
Average TFE		34.39
Average DFE		33.73
% improvement over Part L		1.92
Building		
Air Tightness		3
U Values	Wall	0.18
	Curtain wall	1.4
	Roof	0.13
	Floor (ground)	0.13
	Exposed floor	0.26
	Window (u-value)	1.4
	Window (g-value)	0.32
	BFRC certified glazing?	Y (including curtain wall)
	Door (u-value)	n/a
	Party walls	Fully filled with effective edge sealing
	Corridors heated	Y
Thermal bridging	Accredited construction details implemented?	Y
Ventilation	Whole House Vent?	Y



	Vent details	Vent Axia Sentinel Kinetic High Flow
	SFP/ HR Eff	K+1 - 0.58 / 88% K+2 - 0.55 / 90% K+3 - 0.6 / 91%
	Approved Installation?	Y
	Duct Unsulation?	Y
Cooling	Fixed cooling present?	N
Lighting	Number of fittings 100% low energy?	Y
Elec Tariff	Economy 7/ standard/ other?	Standard
Heating System 1	Boiler type	Electric panel heaters
	Boiler efficiency Emitter type	
	Controls	Programmer & appliance stat
	Flue type Percentage of Heat	100%
Secondary Heating	Type	n/a
	Efficiency HETAS approved?	
DHW	Boiler Type	Megaflo ECO direct Dimplex EDL200UK- 630 to 77 apartments others as below
	Storage	1 bed - 145L 2 bed - 170L 3 bed - 210L
	Standing heat loss (kWh/24hrs)	145L - 1.18



Part G Renewable Technology Detail	Control (cyl stat? time control?)	170L - 1.2 210L - 1.42 Y
	Less than 125l/p/day?	Y
	PV (kWh/yr)	All dwellings Showersave , Blue QB1- 21 / System B (PCDB - 080185)
	WWHR	
	FGHR Wind Solar Thermal	
RISK OF OVERHEATING	Does the development pass the SAP 'risk of overheating ' analysis?	N

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