



**ELEMENT
SUSTAINABILITY**

GREAT JACKSON STREET, PLOT D MANCHESTER

ENVIRONMENTAL STANDARDS STATEMENT

MAY 2024

REF: 2022.176



ELEMENT SUSTAINABILITY – ISSUE NOTES

Project No: 2022.176

Title: Great Jackson Street, Plot D
(Incorporating Tower D and adjacent office block)
Environmental Standards Statement

Client: Renaker Build Limited

Status: Final

Version:	1.2	
Date:	May 2024	
Prepared by:	Checked by:	Approved by:
		
Charles Atkins Sustainability Consultant	Shaun O'Neill Senior Sustainability Consultant	Laurie Wills Director

Version	Version Details	Date Issued	Issued by
0.0	Draft for client comments	23 rd Dec. 2022	CA
0.1	Updated Office Block details	3 rd April 2023	CA
0.2	Updates following client comments	14 th April 2023	CA
1.0	Final version	31 st May 2023	CA
1.1	Updated energy strategy	14 th May 2024	CA
1.2	Final version	16 th May 2024	CA



ELEMENT
SUSTAINABILITY

phone: 01829 733 444

email: hello@elementsustainability.co.uk

© Report copyright of Element Sustainability Ltd.

www: elementsustainability.co.uk

Disclaimer

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



ELEMENT SUSTAINABILITY

CONTENTS

1. Introduction.....	1
2. Development Proposals	2
2.1 Development Site Description	2
2.2 Development Proposals.....	3
3. Policy Review	12
3.1 National Planning Policy	12
3.2 Regional Planning Policy	12
3.3 Places For Everyone.....	12
3.3.1 PFE - Addendum to Manchester Core Strategy	18
3.4 Local Planning Policy	19
3.4.1 Manchester Core Strategy	19
3.4.2 Guide to Development in Manchester, Supplementary Planning Document	22
3.4.3 Manchester’s Great Outdoors	22
3.4.4 Climate Emergency	9
3.5 Regulatory Framework	9
3.6 Applicable Targets	25
4. Sustainability Performance.....	27
4.1 Energy Improvements	27
4.2 Water Conservation	27
4.3 Flood Risk Management.....	27
4.4 Waste Management.....	28
4.5 Materials	29
4.6 Health and Wellbeing	30
4.7 Pollution Control	30
4.8 Ecology and Biodiversity.....	31
4.9 Transport.....	31
4.10 Management.....	32
5. Energy Strategy.....	33
5.1 Energy Strategy	33
5.1.1 Residential Tower D	33
5.1.2 The Lantern Amenity Zone	34
5.1.3 Office Building	35
5.1.4 Building Services Specification	36
6. Renewable Energy Feasibility	38
6.1 Heat Network	39
6.2 Renewable Energy Solution	39



6.2.1	Non-Residential Areas - Air Source Heat Pumps.....	39
6.2.2	Photovoltaics.....	40
6.2.3	Residential Areas - Air Source Heat Pumps.....	40
7.	Energy Performance Calculations	42
7.1.1	Residential Calculations	42
7.1.2	Non-Residential Calculations	44
7.2	Energy Hierarchy	46
7.3	Decarbonisation	47
8.	BREEAM.....	49
8.1	Potential BREEAM Rating	50
9.	Places for Everyone – Policy JP-S2	52
10.	Climate Emergency	54
11.	Conclusion	55



1. INTRODUCTION

Element Sustainability has been commissioned by Renaker Build Ltd. to review the sustainability performance of the proposed Great Jackson Street, Plot D residential tower and office building scheme in 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, Renaker Build Limited, 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

Great Jackson Street, Plot D is currently occupied by a concrete batching plant which has been used to supply the adjacent developments. Situated within Manchester city centre, this development forms part of the wider Great Jackson Street Masterplan and is located to the south of the Crown Street Phase 2 development area, and to the south of the Deansgate Square development. The site is bordered by Great Jackson Street to the north, Melbourne Street to the west, and the Mancunian Way Ring Road to the south.

The red line plan and pre-development plan is presented in figure 2.1.

Figure 2.1 – Red Line Plan

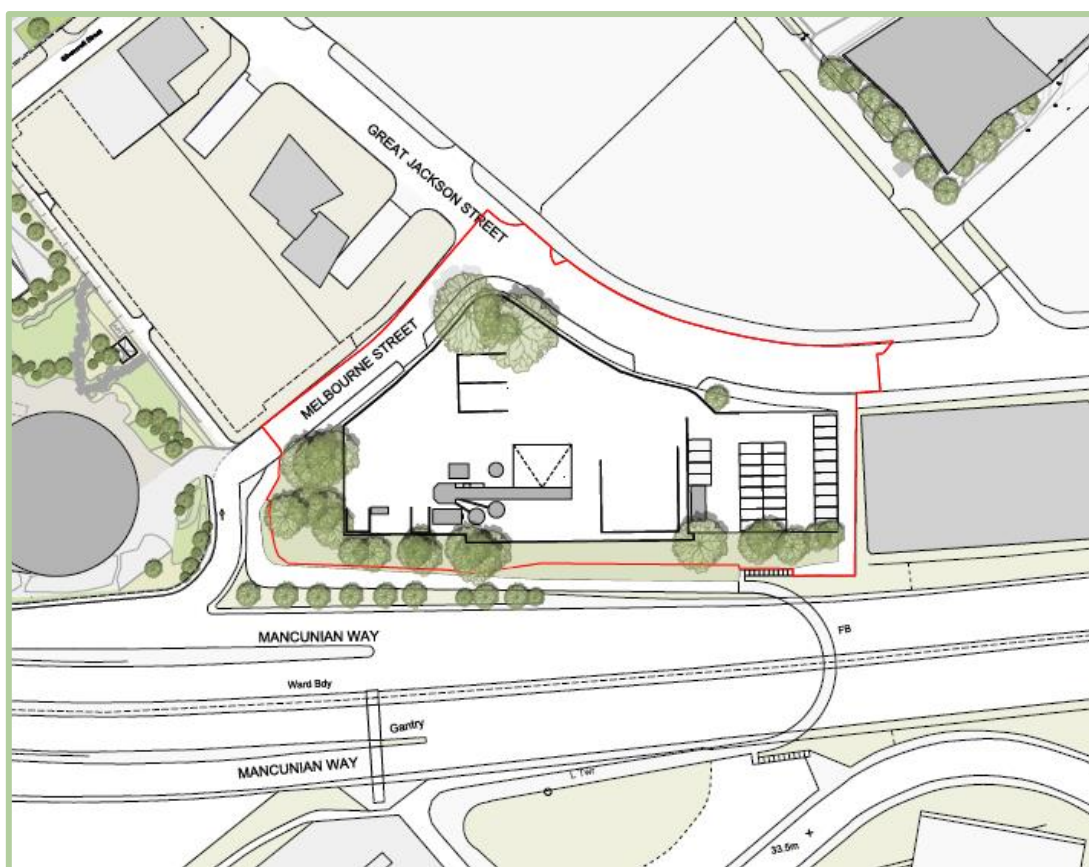


Figure 2.2 – Pre-Developed Site

2.2 Development Proposals

The proposed development will comprise the construction of a seventy-one-storey residential tower, which will incorporate a multi-level podium and basement parking, six hundred and forty-two apartments with residential amenity and a multi-level amenity complex incorporating a restaurant, fitness studio, large pool and gymnasium to the upper extent of the tower, within a glazed lantern feature affording impressive views across Greater Manchester and into Lancashire.

The residential apartments will be split across the first sixty-six floors. In addition to the residential tower, there will also be a three-storey office block adjacent to the residential tower which also forms part of this planning application.

Figures 2.3 to 2.13 present the plans and elevation drawings of the proposed Tower D scheme, incorporating the residential tower and the adjacent office block.



Figure 2.3 - General Arrangement – North Elevation

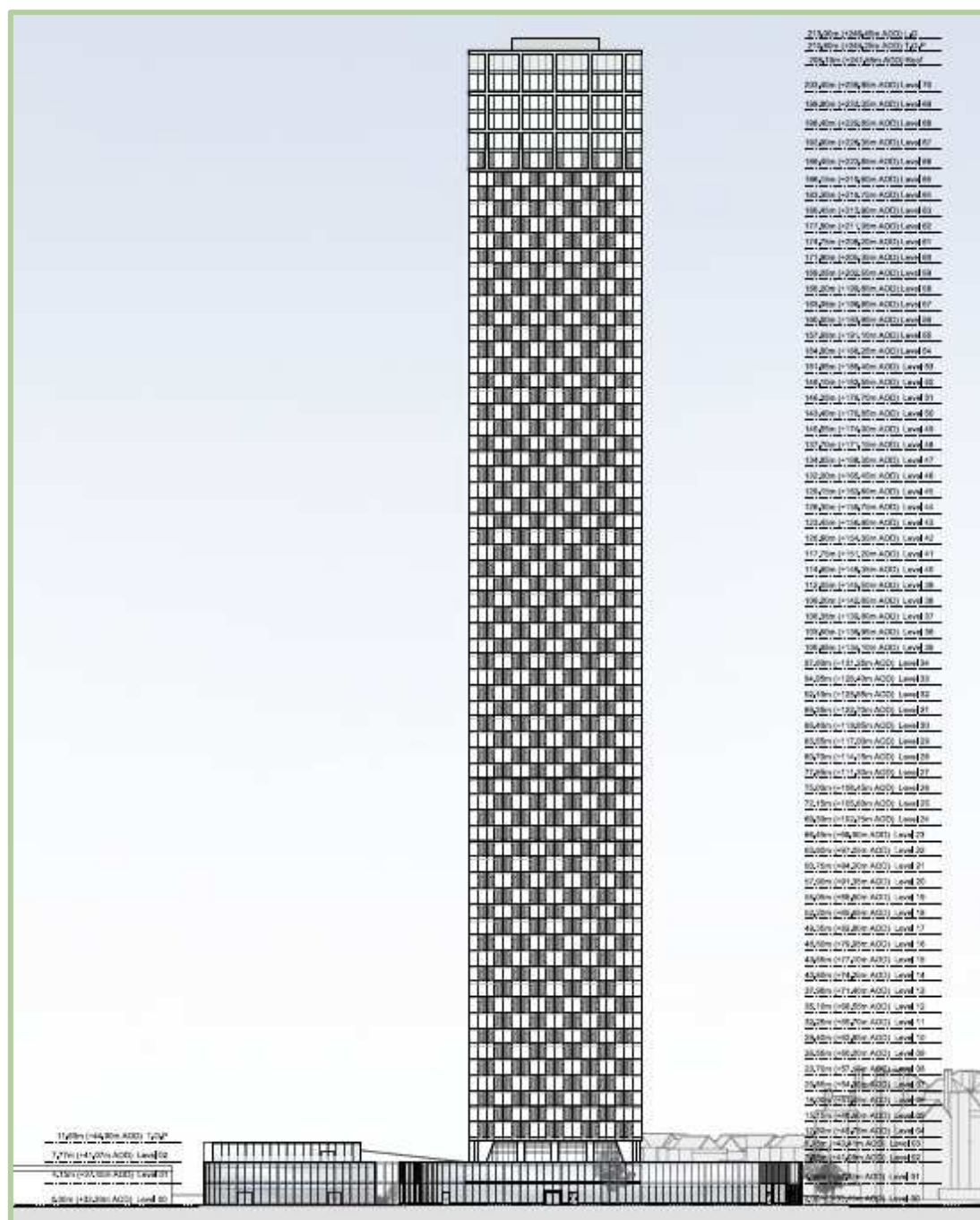


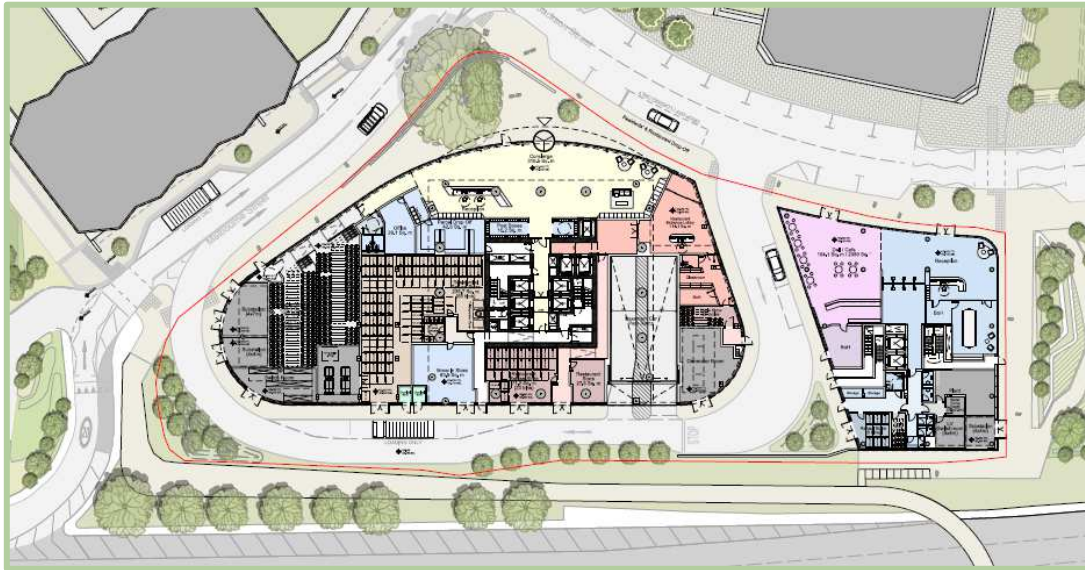
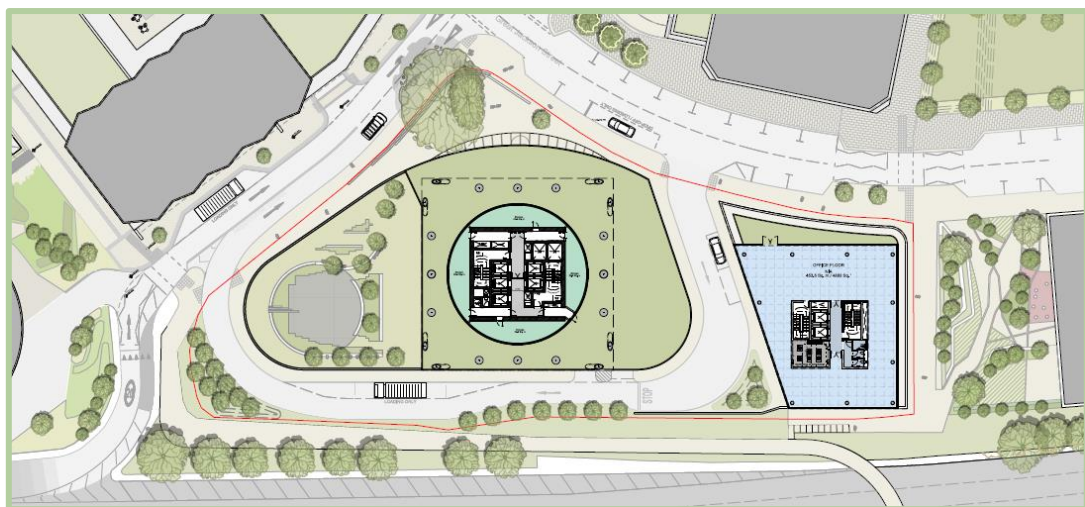
Figure 2.4 – General Arrangement Plan – Level 00*Figure 2.5 – General Arrangement Plan – Level 01**Figure 2.6 – General Arrangement Plan – Level 02*

Figure 2.7 – General Arrangement Plan – Level 03

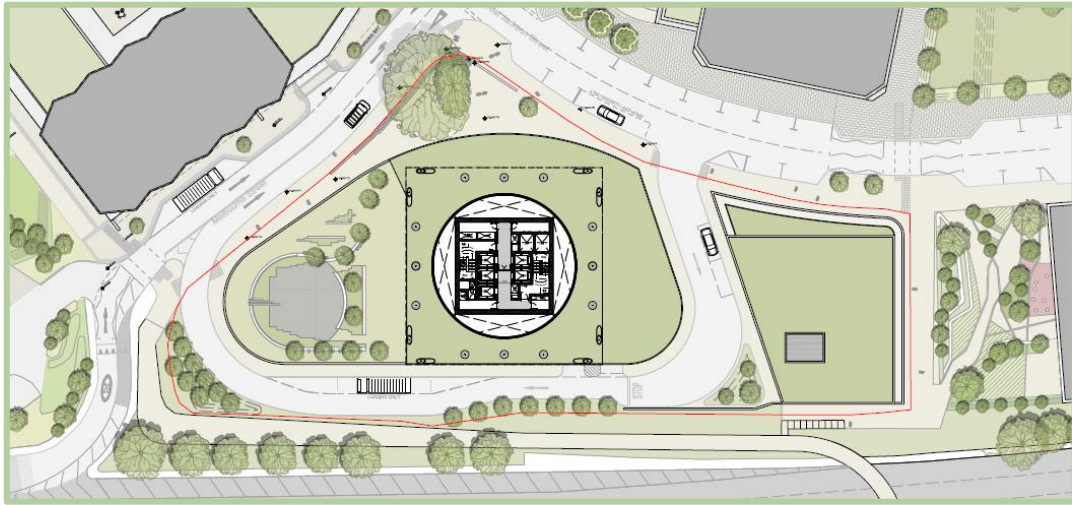


Figure 2.8 – General Arrangement Plan (Tower) – Typical Residential Plan Type 1



Figure 2.9 – General Arrangement Plan (Penthouse Layout) – Level 66



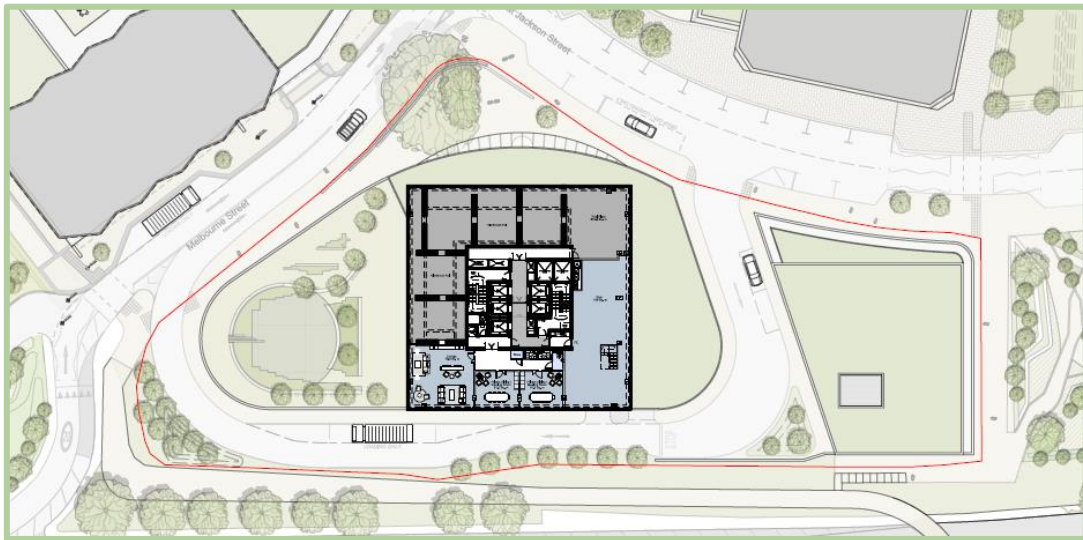
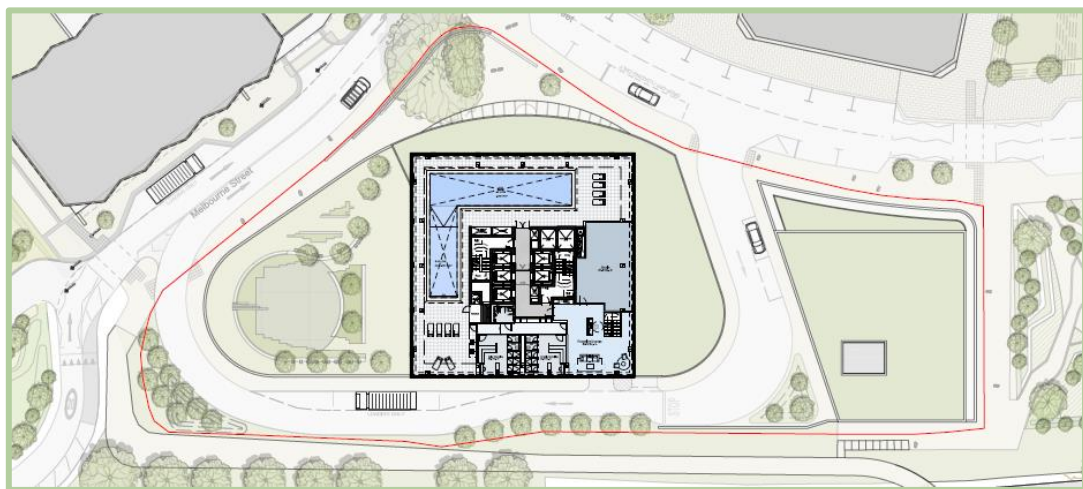
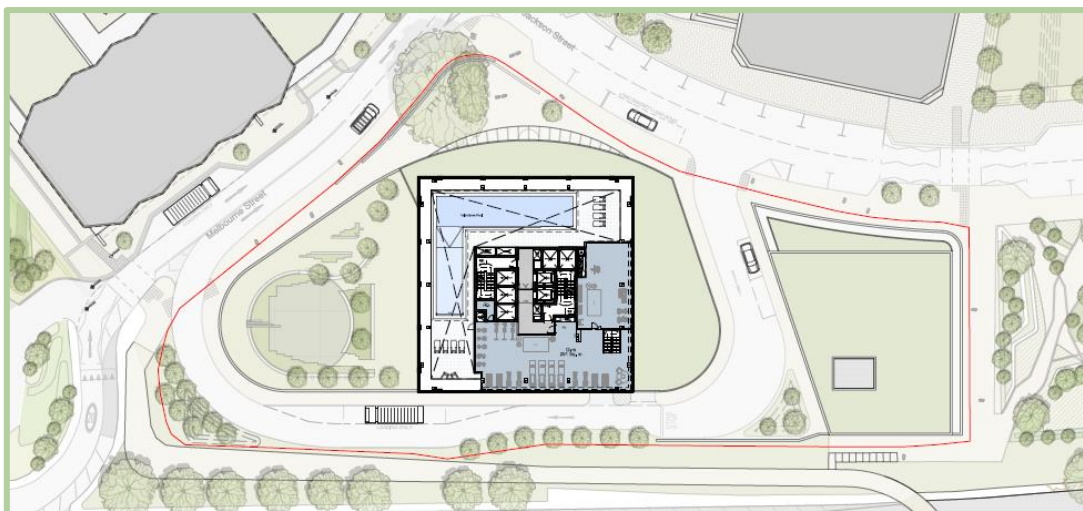
Figure 2.10 – General Arrangement Plan – Level 67*Figure 2.11 – General Arrangement Plan – Level 68**Figure 2.12 – General Arrangement Plan – Level 69*

Figure 2.13 – General Arrangement Plan – Level 70



Figure 2.14 to 2.17 below demonstrate the proposed elevations and plans for the adjacent office block.

Figure 2.14 – North Elevation – Office Block

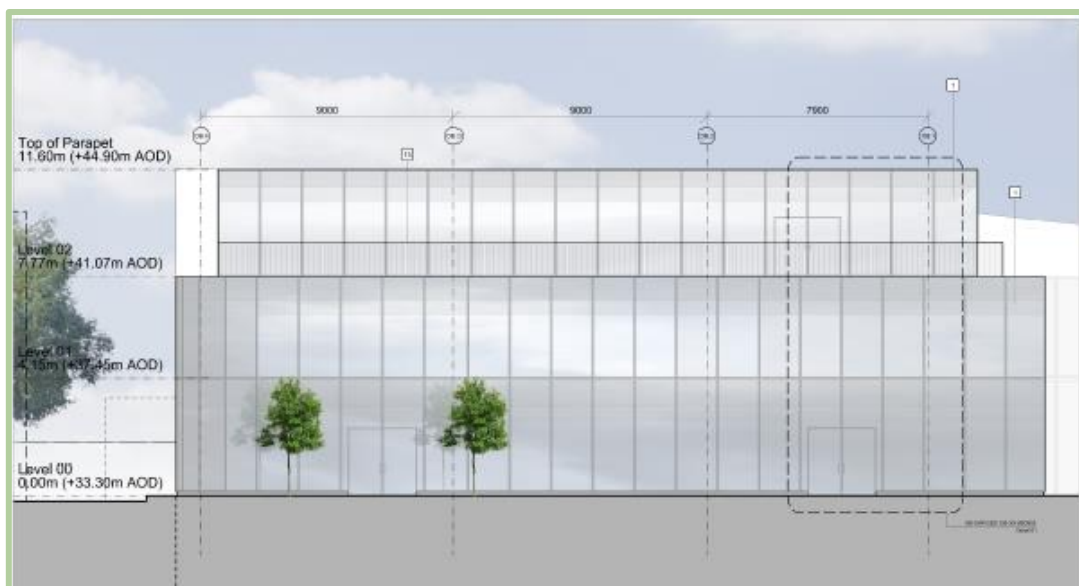
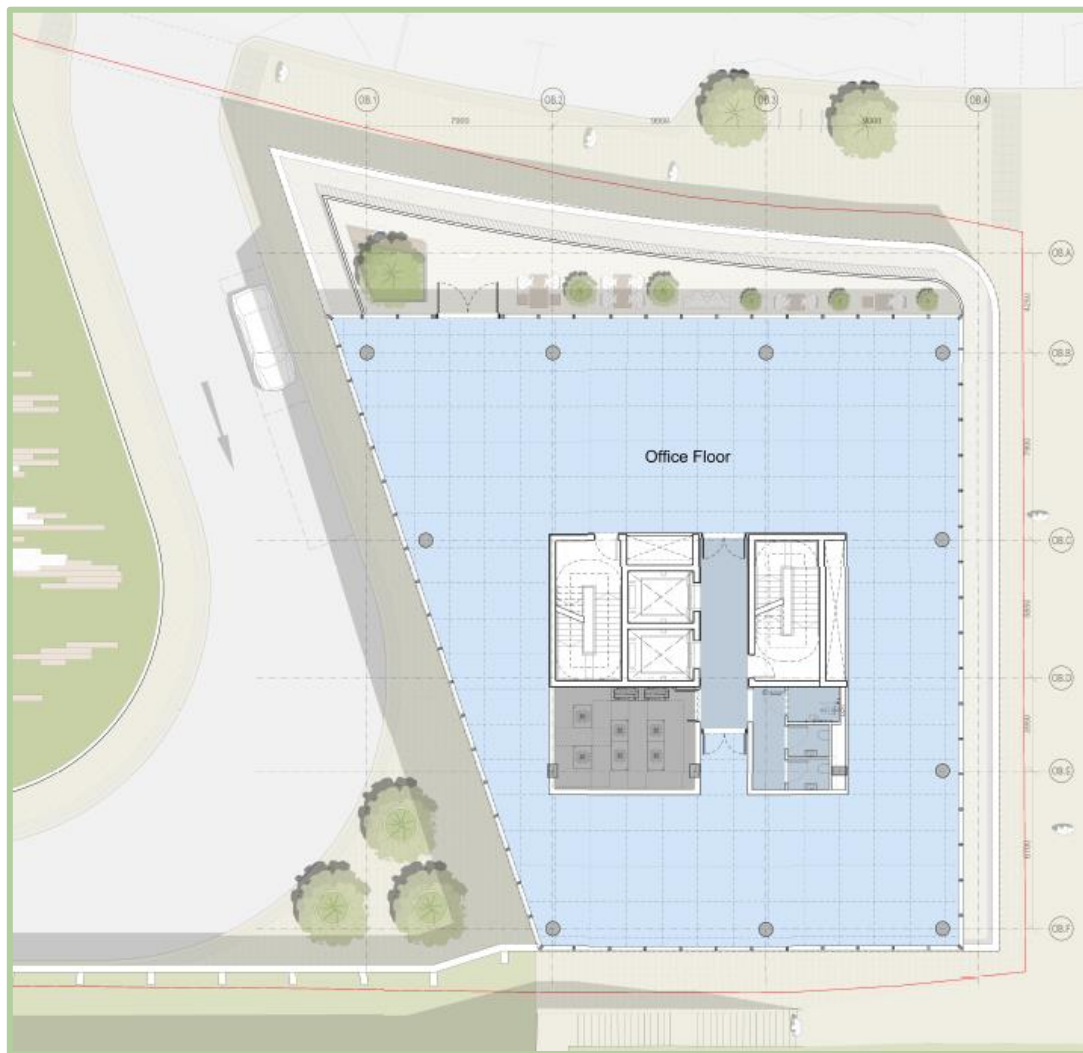


Figure 2.15 – General Arrangement Plan Ground Floor – Office Block

Figure 2.16 – General Arrangement Plan Level 01– Office Block



Figure 2.17 – General Arrangement Plan Level 02– Office Block

3. POLICY REVIEW

3.1 National Planning Policy

The National Planning Policy Framework was revised in response to the Levelling-up and Regeneration Bill: reforms to national planning policy consultation on 19th December 2023 and sets out the government's planning policies for England and how these are expected to be applied.

The purpose of the planning system is to contribute to the achievement of sustainable development. The planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways, as set out below:

An economic role – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types 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 role – to support 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 role – to protect and enhance 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 should be delivered through the preparation and implementation of plans and the application of the policies in this framework. Planning policies and decisions should play an active role in guiding development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area.

3.2 Regional Planning Policy

3.3 Places For Everyone

Places for Everyone is the joint development plan of nine Greater Manchester local authorities (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, and Wigan) dealing with strategic planning issues including jobs, homes, transport, and the natural environment.

All nine authorities adopted the PfE Plan on 21st March 2024. Therefore, this will now become part of the statutory development plan for each of the nine PfE authorities.

As a result, the following policies have been considered as part of the proposed development:

Policy JP-S1: Sustainable Development: To help tackle climate change, development should aim to maximise its economic, social and environmental benefits simultaneously, minimise its adverse impacts, utilise sustainable construction techniques and actively seek opportunities to secure net gains across each of the different objectives.



In bringing forward previously developed sites for development, particular attention will be paid to tackling land contamination and stability issues, ensuring that appropriate mitigation and remediation is implemented to enable sites to be brought back into use effectively.

Addressing Climate Change

Greater Manchester's Vision is to be at the forefront of action on climate change and to make its fair contribution to international commitments by becoming a carbon neutral city region by 2038.

To meet the carbon commitments, the following will be required:

- Be carbon neutral by 2038;
- Hold cumulative carbon dioxide emissions to within the council's carbon budget; and,
- Initiate a programme of mitigation to reduce emissions including by:
 - Significantly upscaling solar photovoltaic energy;
 - Reducing heat demand in homes;
 - Moving away from carbon intensive gas as the primary source of heat; and,
 - Increasing biofuel use.
- In supporting Greater Manchester's ambitions, climate change is a key theme running throughout the plan, rather than being reduced to a single policy, and it is only through this combination of actions that it can be properly addressed. In particular:
 - Methods to de-carbonise the city region through new and existing development, effective land management and through the provision of infrastructure and new technologies Policy JP-S2 'Carbon and Energy'; and,
 - The delivery of renewable and low carbon energy schemes Policy JP-S3 'Heat and Energy Networks'.

Carbon and Energy

- Meeting the 2038 carbon neutrality target will require a radical transformation across a range of sectors to drive carbon reduction. Within this, new development will have a critical role to play and all new homes and commercial/industrial buildings will need to achieve net zero carbon by 2028.
- It is expected that development in the plan area will apply a net zero carbon approach to operational emissions up until 2028, thereafter emissions in construction should be considered. Minimum carbon reduction targets will be set in line with the Future Homes Standard of 80% or until such a time this is superseded.
- From 2025, applicants will need to demonstrate carbon reductions have been maximised with an opportunity to offset any residual carbon to a carbon offset fund. The approach will be reviewed in line with future standards as they are introduced.
- Therefore, where planning applications for residential development are accompanied by an energy statement, the following best practice thresholds should be seen as the starting point in relation to reducing energy demand and onsite renewable energy generation. The thresholds set out in Table 3.1, for post 2025, are consistent with the GM Five Year Environment Plan.



Table 3.1 – Thresholds for Reducing Energy Demand and Onsite Renewable Energy

	Space Heat Demand	Hot Water Energy Demand	Renewable Energy Generation Targets
2021 - 2025	Houses (30kWh/m ²) Flats (25kWh/m ²)	20% energy demand reduction in the total heat required for water heating	Photovoltaic installation: 20% ground floorspace
2025 - Onwards	Houses (20kWh/m ²) Flats (15kWh/m ²)	20% energy demand reduction in the total heat required for water heating	Photovoltaic installation: 40% ground floorspace

- In calculating carbon emissions from 2025, 'unregulated' emissions (e.g. those associated with cooking and small appliances) should be assessed, in addition to 'regulated' emissions. The only way that this can be deliverable will be through the use of onsite electricity generation or through carbon offsetting ('allowable solutions') as occupants' lifestyle choices are not pre-determined by energy efficiency measures associated with construction standards.
- By following the energy hierarchy, new development will need to achieve net zero carbon through the maximisation of on-site measures first. However, circumstances where a development has demonstrated that the hierarchy has been followed and there are no reasonable alternatives to meet the minimum carbon reductions, then payment to offset remaining emissions will also be required. Such payments should be expected to fund other carbon saving programmes within Greater Manchester to help meet the 5 Year Environment Plan targets.

Policy JP-S 2 – Carbon and Energy: The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

- Promoting the use of life cycle cost and carbon assessment tools to ensure the long-term impacts from development can be captured;
- Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;
- An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;
 - Be net zero carbon which applies:
 - From adoption – to regulated operational carbon emissions;
 - From 2028 - to all emissions 'in construction'.



- From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions.
- Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:
 - Minimise energy demand;
 - Maximise energy efficiency;
 - Use renewable energy;
 - Use low carbon energy; and
 - Utilise other energy sources.
- From 2025 any residual carbon emissions that cannot be fully mitigated onsite should be offset, in agreement with the relevant local planning authority, through a financial contribution to a carbon offset fund;
- As an interim measure, development should be consistent with the 2021 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.
 - Where practicable, prioritise connection to a renewable energy/heating/cooling network in the first instance or a low carbon energy/heating/cooling network that is adaptable to non-fossil fuels at a later date; and,
 - In residential developments, achieve energy demand reductions for residential development in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation.
- For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced; and,
- Include a detailed energy statement to demonstrate via site relevant evidence how the development has sought to maximize reductions in carbon emissions in line with relevant policy targets, including the minimisation of overheating risks and appropriate measures for post occupancy evaluation. Whole life cycle emissions should be considered where possible.
- Districts Local Plans may set out specific carbon emission reduction and energy demand targets within Local Plans.

Policy JP-STRAT14 - A Sustainable and Integrated Transport Network: New development will have a significant role in delivering a sustainable and integrated transport network in order to reduce car dependency and increase levels of walking, cycling and public transport.

Policy JP-S3 – Heat and Energy Networks: The provision of decentralised energy infrastructure is critical to the delivery of our objectives for low carbon growth, carbon reductions and an increase in local energy generation. The following measures will help to achieve this:

1. Delivery of renewable and low carbon energy schemes will be supported with particular emphasis on the use of decentralised energy networks in areas identified as “Heat and Energy Network Opportunity Areas”. These have been identified where:
 - a. Existing heat/energy networks are operational or have been commissioned;
 - b. Sufficient density of existing heat demand occurs; and
 - c. Significant future development is proposed at the strategic development locations.



2. Within the identified “Heat and Energy Network Opportunity Areas”, unless it can be demonstrated that there are more effective alternatives for minimising carbon emissions or such connection is not practicable or financially viable.

Policy JP-S4 - Flood Risk and the Water Environment: An integrated catchment-based approach will be taken to protect the quantity and quality of water bodies with reference to the North West River Basin Management Plan and managing flood risk, by:

- Working with natural processes and adopting a natural flood management approach to slow the speed of water drainage and intercept water pollutants;
- Locating and designing development so as to minimise the impacts of current and future flood risk, including retrofitting or relocating existing developments, infrastructure and places to increase resilience to flooding; and,
- Expecting developments to manage surface water runoff through sustainable drainage systems and as close to source as possible. Development should achieve greenfield run-off rates unless it is demonstrated to be impracticable.
- Ensuring that sustainable drainage systems:
 - Are designed to provide multifunctional benefits wherever possible, including for water quality, nature conservation and recreation;
 - Avoid adverse impacts on water quality and any possibility of discharging hazardous substances to ground;
 - Are delivered in a holistic and integrated manner, including on larger sites split into different phases; and
 - Are managed and maintained appropriately to ensure their proper functioning over the lifetime of the development.
- As a minimum, residential development should meet the mandatory water efficiency standard of 125 litres/person/day as set out in Building Regulations. District local plans may and should consider setting a tighter water efficiency standard of 110 litres/person/day where there is a clear local need with reference to national guidance on housing optional technical standards.

Policy JP-S6 - Resource Efficiency: The achievement of a circular economy and a zero-waste economy will play a key role in meeting Greater Manchester’s ambition of becoming a leading green city region by 2038. The following measures will help achieve this:

- Development and implementation of the Zero Waste Strategy for Greater Manchester which promotes overall reduction in the level of waste produced and supports resource efficiency within the Plan area in order to gain the maximum value from the things we produce;
- Recognition of the role of existing infrastructure in managing our waste and protecting such facilities to ensure adequate waste management capacity is maintained; and
- Using sustainable design and construction techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use.

Policy JP-G2 – Green Infrastructure Network: A strategic approach will be taken to the protection, management and enhancement of Greater Manchester’s Green Infrastructure in order to protect and enhance the ecosystem services which the Green Infrastructure Network provides, including flood management, climate change mitigation and adaptation.

Wherever practicable, opportunities to integrate new and existing green infrastructure into new development will be taken to protect, enhance and expand the green infrastructure network.



Policy JP-G6: Urban Green Space: To ensure there is an appropriate scale, type, quality and distribution of accessible urban green space that can support a high quality of life and other important green infrastructure functions:

- Existing urban green space will be protected and enhanced in balance with other considerations; and
- Developers and other stakeholders will be required to deliver new high quality urban green spaces.

Development should be designed to support the positive use of nearby green spaces, such as by offering a high-quality setting, providing natural surveillance, and facilitating easy access by walking and cycling.

Policy JP-G7 - Trees and Woodland: the aims and objectives of the Greater Manchester Tree and Woodland Strategy, aiming to significantly increase tree cover, protect and enhance woodland, and connect people to the trees and woodland around them.

This will be done through local planning and associated activities such as:

- Where development would result in the loss of existing trees, requiring replacement on the basis of two new trees for each tree lost, or other measures that would also result in a net enhancement in the character and quality of the treescape and biodiversity value in the local area, with a preference for on-site provision; and
- Protecting trees and woodland during the construction phase of development.

Policy JP-G8: A Net Enhancement of Biodiversity and Geodiversity: Through local planning and associated activities a net enhancement of biodiversity resources will be sought, including, where relevant, by:

- Increasing the quality, quantity, extent and diversity of habitats, particularly priority habitats identified in national or local biodiversity action plans and those that support priority species;
- Improving connections between habitats, to protect and enhance the provision of corridors, ecological networks (including Nature Recovery Networks) and steppingstones that enable the movement of species, especially as the climate changes;
- Enhancing the management of existing habitats, including through habitat restoration, avoiding habitat fragmentation and combating invasive species;
- Protecting sites designated for their nature conservation and/or geological importance, with the highest level of protection given to international and then national designations;
- Facilitating greater access to nature, particularly within urban areas;
- Supporting the development and implementation of the Great Manchester Wetlands Nature Recovery Network; and
- Safeguarding, restoring and sustainably managing our most valuable soil resources, tackling soil degradation/erosion and recovering soil fertility.

Development will be expected to:

- Follow the mitigation hierarchy of:
 - Avoiding significant harm to biodiversity, particularly where it is irreplaceable, through consideration of alternative sites with less harmful impacts, then
 - Adequately mitigating any harm to biodiversity, then
 - Adequately compensating for any remaining harm to biodiversity.
- Achieve a measurable net gain in biodiversity of no less than 10%; and,



- Development proposals should be informed by the findings and recommendations of the appropriate biodiversity/ecological assessment(s) in the PfE evidence base and/or any updated or appropriate biodiversity/ecological assessments submitted as part of the planning application process.

Policy JP-P1 - Sustainable Places: The aim is to become one of the most liveable city regions in the world, consisting of a series of beautiful, healthy and varied places, each having the following key attributes that all development, wherever appropriate, should be consistent with:

- Distinctive, with a clear identity that:
 - Conserves and enhances the natural environment, landscape features, historic environment and local history and culture;
 - Enables a clear understanding of how the place has developed; and
 - Respects and acknowledges the character and identity of the locality in terms of design, siting, size, scale and materials used.
- Resilient, capable of dealing with major environmental events;
- Adaptable, able to respond easily to varied and changing needs and technologies;
- Durable, being built to last and using robust materials that reflect local character, weather well and are easily maintained;
- Resource-efficient with:
 - A low carbon footprint;
 - Efficient use of land;
 - Minimised use of new materials; and,
 - High levels of recycling,
- Supported by critical infrastructure, such as energy, water and drainage and green spaces; and,
- Functional and convenient, enabling people and uses to act efficiently with minimal effort, and responding to needs relating to servicing, recycling facilities, refuse collection and storage.

3.3.1 PFE - Addendum to Manchester Core Strategy

Following the adoption of the PfE document, the subsequent Core Strategy (CS) policies have been partially replaced by Places for Everyone (PfE) policies. Any part of the policy that is not replaced remains part of Manchester's Core Strategy.

CS Policy EN4 Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development: The following bullet point is what has been replaced:

- All development must follow the principle of the Energy Hierarchy.

This policy was replaced by PfE Policy JP-S2.

CS Policy EN6 Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies: The following aspects of the policy have been replaced:

- The CO₂ emissions reduction targets and the target framework development locations

This policy was replaced by PfE Policy JP-S2.

CS Policy EN8 Adaption to Climate Change: The following bullet point is what has been replaced:



- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rainwater permeability; and,
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

This policy was replaced by PfE Policies JP-S2, JP-S4 and JP-G8.

CS Policy EN14 Flood Risk: The following bullet point is what has been replaced:

- All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required.

This policy was replaced by PfE Policy JP-S4.

CS Policy EN15 Biodiversity and Geological Conservation: The following aspects of the policy have been replaced:

Development should wherever possible seek to maintain, enhance or restore existing geology.

This policy was replaced by PfE Policy JP-G8.

These elements of the above policies have therefore been removed from the previous Local Planning Policy section.

3.4 Local Planning Policy

3.4.1 Manchester Core Strategy

Manchester's Core Strategy was adopted on the 11th July 2012 and remains the key document in the adopted Manchester Local Plan. It sets out the long-term strategic policies for Manchester's future development and will form the framework that planning applications will be assessed against.

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'.

CS Policy EN 4 - Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development: The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO₂ emissions, and rising fossil fuel prices, through the following actions:

- 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.

Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.



Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes.

The use of building materials with low embodied carbon in new development and refurbishment schemes

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

Within Manchester it is considered that the following strategic areas, will have a major role to play in achieving an increase in the level of decentralised, low and zero carbon energy supplies available:

- 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 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.

Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO₂ mitigation under Policy EN6, subject to sufficient evidence to quantify their contribution to compliance.

CS Policy EN9 - Green Infrastructure: New development will be expected to maintain existing green infrastructure in terms of its quantity, quality and multiple function. Where the opportunity arises, and in accordance with current Green Infrastructure Strategies, the Council will encourage developers to enhance the quality and quantity of green infrastructure, improve the performance of its functions and create and improve linkages to and between areas of green infrastructure. Where the benefits of a proposed development are considered to outweigh the loss of an existing element of green infrastructure, the developer will be required to demonstrate how this loss will be mitigated in terms of quantity, quality, function and future management.



CS Policy EN14 – 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; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).

CS Policy EN15 – Biodiversity and Geological Conservation: The Council will seek to maintain or enhance sites of biodiversity and geological value throughout the city.

Developers will be expected to identify and implement reasonable opportunities to enhance, restore or create new biodiversity, either on-site or adjacent to the site, contributing to linkages between valuable or potentially valuable habitat areas where appropriate, with reference to:

- The Manchester Biodiversity Strategy, which provides further details of priority habitats within Manchester and opportunities for biodiversity enhancement including corridors such as the Mersey, Medlock and Irk River valleys, the canals and disused railway lines, and areas of managed greenspace particularly in parks;
- The Green Infrastructure Framework for Greater Manchester, which encompasses an ecological framework that seeks to guide and inform habitat creation and repair, including identifying large 'biodiversity opportunity areas' including the Moston Brook Corridor and Nutsford Vale;
- Manchester's Climate Change Action Plan;
- The Strategic Flood Risk Assessment (SFRA) for Manchester;
- The River Basin Management Plan for the North West; and,
- The Manchester Tree Strategy.

Any adverse impacts on biodiversity will need to be justified against the wider benefits of the proposal, assessed against other Local Development Framework policies. Where adverse impacts are unavoidable, developers will be required to provide appropriate mitigation and/or compensation. Development should, wherever possible, seek to maintain, enhance or restore existing geology.

CS Policy EN19 – Waste: The Council will:

- Require all developers, including those of new waste management facilities within the district, to demonstrate the proposal's consistency with the principles of the waste hierarchy (prevention, reduction, re-use, recycling/composting, energy recovery, final disposal);
- Require all developers to submit a waste management plan to demonstrate how both construction and demolition waste will be minimised, and recycled on site wherever possible, and how the sustainable waste management needs of the end user will be met; and,
- Encourage communities to take responsibility for the waste they create through the provision of accessible facilities.

CS Policy DM1 – Development Management: All development should have regard to the following specific issues, for which more detailed guidance may be given within a supplementary planning document:

- Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes;
- Community safety and crime prevention;
- Design for health;
- Adequacy of internal accommodation and external amenity space;



- Refuse storage and collection;
- Effects relating to biodiversity, landscape, archaeological or built heritage;
- Green Infrastructure including open space, both public and private;
- The use of alternatives to peat-based products in landscaping/gardens within development schemes, and;
- Flood risk and drainage.
- Subject to scheme viability, developers will be required to demonstrate that new development incorporates sustainable construction techniques as follows (In terms of energy targets this policy should be read alongside policy EN6 and the higher target will apply):
 - For new residential development meet as a minimum the following Code for Sustainable Homes standards. This will apply until a higher national standard is required:
 - Year 2010 – Code Level 3;
 - Year 2013 - Code Level 4;
 - Year 2016 - Code Level 6; and,
 - For new commercial developments to demonstrate best practice which will include the application of the BREEAM (Building Research Establishment Environmental Assessment Method) standards.

3.4.2 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 11th 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; | • Waste management; |
| • Renewable energy; | • Construction management; |
| • Environmental design; | • Biodiversity; and, |
| • Water management and weather resilience; | • Waterways. |

3.4.3 Manchester's Great Outdoors

The 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.

3.4.4 Climate Emergency

On 10th July 2019, a motion asking Manchester City Council (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 Manchester is committed to embedding the issue as an integral part of council decision-making – making sure that all key decisions are taken with the city's target of becoming zero-carbon by 2038 in mind. The council has agreed the following:

- To deliver the 2038 zero carbon 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; and
- 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.

In March 2020 the Executive adopted the Manchester Climate Change Framework 2020-2025. The five-year framework sets out measures that MCC will take in order to reduce carbon emissions from its buildings, energy use and transport. Measures include 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.

3.5 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 documents are referenced below:

Approved Document Volume 1: Dwellings (2021 Edition) -. Part L 2021 standards are expected to reduce dwelling carbon emissions by thirty one percent in relation to Building Regulations Part L1A (2013).



The minimum energy performance requirements shall be approved and expressed in accordance with the methodology for:

- a) New buildings (which shall include new dwellings), in the form of target CO₂ emission rates;
- b) New dwellings, in the form of target fabric efficiency rates; and
- c) New dwellings in the form of target primary energy rates.

The dwelling primary energy rate, dwelling emission rate and dwelling fabric energy efficiency rate must not exceed the target primary energy rate, target emission rate and target fabric energy efficiency rate, respectively.

Approved Document Volume 2: Buildings Other Than Dwellings (2021 Edition) - gives guidance on how to comply with Part L of Schedule 1 to the Building Regulations and the energy efficiency requirements for buildings other than dwellings. Part L 2021 standards are expected to achieve a twenty seven percent reduction in carbon emissions over the Part L2A 2013 regulations.

Building Regulations, Part O – Overheating sets the compliance standards for overheating in buildings. Guidance on how to meet the requirements of this regulation is provided within Approved Document O. The relevant document is referenced below:

Approved Document O addresses overheating in new dwellings. Part O (2021) requires all newly constructed dwellings to comply with the O1: Overheating Mitigation requirements. The aim of requirement O1 is to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures. O1 is met by designing and constructing the building to achieve both of the following:

- a) Limiting unwanted solar gains in summer; and
- b) Providing an adequate means of removing excess heat from the indoor environment.

Compliance with requirement O1 can be demonstrated by using one of the following methods:

- a) The simplified method for limiting solar gains and providing a means of removing excess heat, as set out in Section 1 of the Approved Document; and
- b) The dynamic thermal modelling method, as set out in Section 2 in the Approved Document.

3.6 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 the school (Phase C):

- **Manchester Core Strategy**
 - **CS Policy EN 4** – Reducing CO₂ Emissions;
 - **CS Policy EN 5** - Strategic Areas for low and zero carbon decentralised energy infrastructure;
 - **CS Policy EN 6** – Target Framework for CO₂ Reductions From Low or Zero Carbon Energy Supplies;
 - **CS Policy EN 8** – Adaption to Climate Change;
 - **CS Policy EN9** – Green Infrastructure
 - **CS Policy EN14** – Flood Risk
 - **CS Policy EN15** – Biodiversity & Geological Conservation
 - **CS Policy EN19** – Waste
 - **CS Policy DM1** – Development Management



- **Places For Everyone**
 - **Policy JP-S1:** Sustainable Development
 - **Policy JP-S2:** Carbon & Energy
 - **Policy JP-STRAT14:** A Sustainable and Integrated Transport Network
 - **Policy JP-S3:** Heat and Energy Networks
 - **Policy JP-S4:** Flood Risk and the Water Environment
 - **Policy JP-S6:** Resource Efficiency
 - **Policy JP-G2:** Green Infrastructure Network
 - **Policy JP-G6:** Urban Green Space
 - **Policy JP-G7:** Trees and Woodland
 - **Policy JP-G8:** A Net Enhancement of Biodiversity and Geodiversity
 - **Policy JP-P1:** Sustainable Places
- **The Guide to Development in Manchester SPD;**
- **A Green and Blue Infrastructure Strategy for Manchester;**
- **Guidance within the Acoustics, Ventilation and Overheating, Residential Design Guide' , (AVO) published**
- **Building Regulations**
 - **Part L:**
 - Approved Document Volume 1
 - Approved Document Volume 2
 - **Part O**
 - Approved Document O



4. SUSTAINABILITY PERFORMANCE

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 this scheme. This section outlines those commitments that have been made to ensure this scheme contributes to sustainable development and meets the council's policy aims.

4.1 Energy Improvements

In order to limit energy demand and carbon dioxide (CO₂) 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 approach to improving the buildings' performance by applying a fabric-led strategy, allied to improvements in the efficiency of the mechanical and electrical systems and through the introduction of renewable technologies.

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
- Heat recovery ventilation systems (MVHR)
- High efficiency LED lighting
- Air Source Heat Pumps
- Photovoltaic Array

These reductions are in line with the Manchester Core Strategy and PfE Policy JP-S2.

4.2 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 dual flush WCs); and,
- In order to reduce water demand, low volume / high efficiency sanitary fixtures will be specified to achieve a 50% reduction over the Building Research Establishment's baseline performance.
- In order to reduce water demand, the sanitary fixtures specified will achieve a calculated daily consumption of <105 litres/person/day.

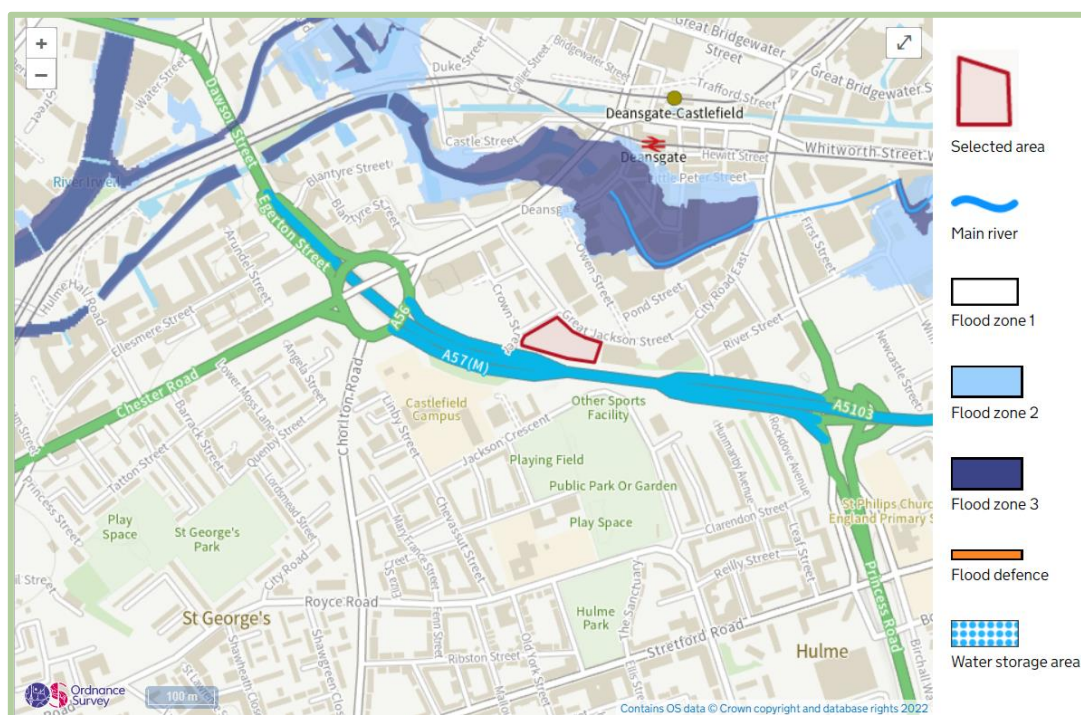


4.3 Flood Risk Management

Flood Risk -

- The site is located within Flood Risk Zone 1, and the probability of flooding is low, with a 1 in 1,000 annual probability of river flooding as demonstrated in figure 4.1.

Figure 4.1 – Environment Agency Flood Zone Map



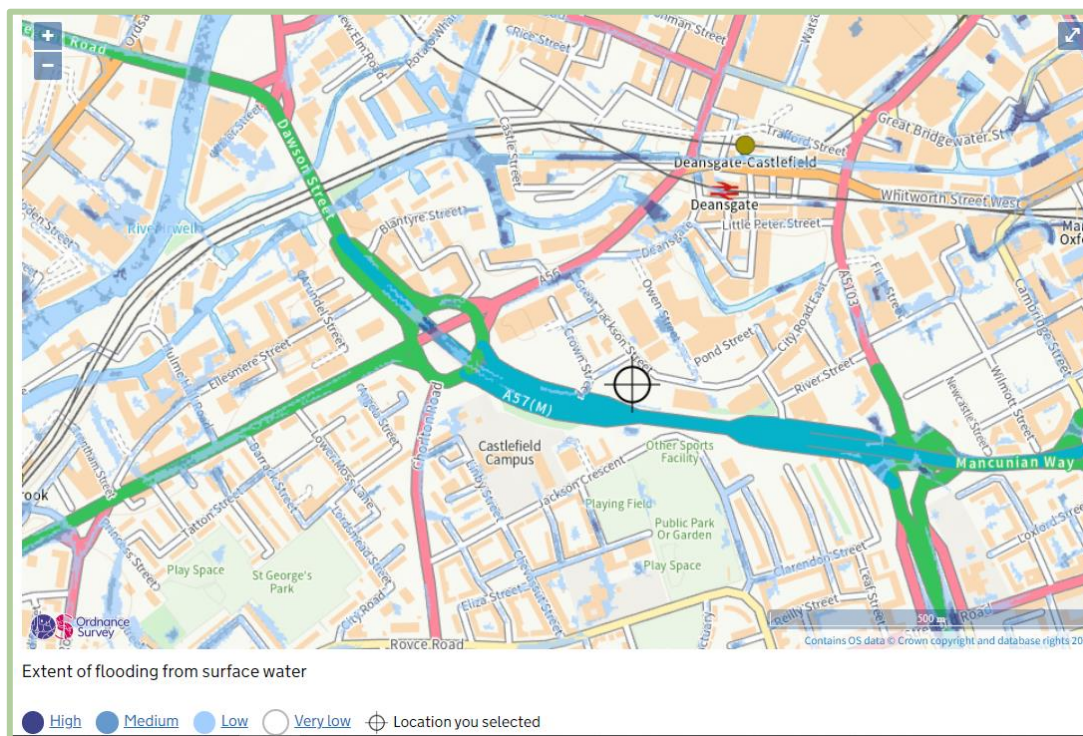
- The Bridgewater canal is located to the north of the site; and according to the councils Level 2 SFRA Hydraulic Interactions map, the site will not be affected by flooding from this canal;
- The Environment Agency's Reservoir Flood map demonstrates that the site is not within an area that could be affected by flooding from reservoirs in the event of a reservoir failure;

Surface Water -

- The Environment Agency's Map of long-term flood risk from surface water, indicates that most of the site is at 'Very Low' risk. This area, therefore, has a chance of flooding of less than 0.1% each year as demonstrated in figure 4.2; and,
- Post development surface water run-off rates will be managed and mitigated through the implementation of SUDs in accordance with Core Strategy Policy EN14.



Figure 4.2 – Extent of Flooding from Surface Water



4.4 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:

- 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 encourage the implementation of the waste hierarchy of prevention and detail the following:
 - Recycled and secondary materials;
 - Waste reduction;
 - Waste segregation;
 - Waste recovery; and,
 - Waste disposal.
- This scheme will promote the minimisation of waste arising in site development and seek to maximise the use of recycled materials in construction;
- A target of 90% of waste to be diverted away from landfill will be established for the construction phase of the development; and
- The site waste management plan will identify opportunities to minimise waste generation and divert construction waste from landfill.



Operational Waste

The operational waste strategy for the scheme focuses on the segregation of waste at source in order to maximise the potential for residents and visitors to recycle. All Tower D residents will receive 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:

Tower D –

- Waste will be segregated at source with the help of segregated bins. It is expected that there will be multiple streams of waste – general, recyclables and compost / green waste;
- Residents will be required to take their waste to the waste chute, which operates an automated tri-separator at the bottom of the chute.
- The number of bins, and subsequently the size of the refuse store, is based on waste generation figures for each apartment;
- The management company will be responsible for transferring the waste from the refuse store to a hardstanding service area on the day of collection by refuse operators; and
- Following collection, the bins will be returned to the refuse store.

Office Block –

- Waste will be segregated at source with the help of segregated bins. It is expected that there will be multiple streams of waste – general, recyclables and compost / green waste;
- The management company will be required to transfer the buildings waste (via lifts) to the refuse stores;
- The number of bins, and subsequently the size of the refuse store, is based on waste generation figures of the office block;
- The management company will be responsible for transferring the waste from the refuse store to a hardstanding service area on the day of collection by refuse operators; and
- Following collection, the management company will return the bins to the refuse store.

4.5 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:

- Low carbon construction methods and materials with low embodied carbon levels throughout their whole lifecycle will be prioritised;
- 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;
- Material selection within the buildings 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,



- 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.

4.6 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 throughout both buildings. This will improve the occupant's comfort and reduce the need for energy to artificially light the building;
- Thermal comfort calculations will be conducted to demonstrate that the residential building is not deemed to be at risk from overheating.
- This proposal seeks to achieve the following, in response to the technical guidance provided within AVO 2020:
 - Facades which satisfy strict sound insulation criteria which has been established in consultation with the Local Authority and the acoustic consultant;
 - Apartments will not suffer from overheating; and,
 - Internal noise levels are reduced as far as possible in all conditions.
- This scheme will be built in compliance with Building Regulations, Part O.
- The very concept of the proposed residential development will enhance the character of the area, as a familiar neighbourhood where people will live and spend their free time, supporting a vibrant, diverse and inclusive community.

4.7 Pollution Control

To reduce emissions of gases with high global warming potential (GWP) and nitrogen oxide (NOx) into the atmosphere, the buildings will be specified with:

- Insulating materials that have a GWP of less than five throughout the development to reduce the construction phase impact of this scheme upon climate change.
- Pollution Prevention Guidance will be adhered to in respect 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 and limit the impact of artificial lighting on the surrounding environment;
- 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.



4.8 Ecology and Biodiversity

An Ecological Survey and Assessment has been produced by ERAP Ltd to assess the ecological, biodiversity and nature conservation status of the site. From this the following conclusions can be drawn:

- The site is not and does not form part of any statutory designated site for nature conservation. However, the site does lie within a Site of Special Scientific Interest (SSSI) Impact Risk Zone. However, It is considered that the proposals do not meet the criteria which would require the local planning authority to consult with Natural England in respect of likely risks to the statutory designated sites as a consequence of the proposed development
- The scattered trees, scrub and bramble scrub are of value to the site, as they are of value to nesting and foraging birds. The area of hard standing and colonising vegetation are not considered to be of any value in terms of a geographical context.
- Common and widespread plant species were found on site. However, none of the habitats within the site are of significant interest in terms of their plant species composition.

Recommendations -

ERAP Ltd have provided the following recommendations to further enhance the biodiversity and ecological status of the proposed development to align with the 10% net gain requirement stipulated within PfE Policy JP G8:

- The risk of adverse effects on off-site habitats and wildlife as a result of dust, spills and leaks will be controlled by the application of best practice measures and appropriate environmental controls such as dust suppression, appropriate storage of chemicals and fuel, presence of spill kits and appropriate training of on-site personnel;
- It is advised that any works such as vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season;
- Commencement of any works in the nesting season must be informed by a pre-works nesting bird survey;
- The installation of two general bird nest boxes and two swift nest boxes is recommended;
- To further enhance the ecological value of the site, landscape planting should be composed from native species and species known to be of value for the attraction of wildlife;
- It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting.
- The development proposal will provide an opportunity to secure ecological enhancement for fauna typically associated with urban areas such as breeding birds.

4.9 Transport

The proposed site has a high level of connectivity and benefits from access to a number of sustainable transport options within close proximity to the site, as follows:



- There are bus stops located within walking distance of the site on Chester Road and the A56, providing frequent links between the city centre and Partington.
- Deansgate Rail Station and tram stop, and Deansgate-Castlefield are both within a short walk of the site, offering excellent links to the regional and national rail network.
- Supporting this is a good level of pedestrian and cycle infrastructure within the vicinity of the site, linking the surrounding area and public transport stops, ensuring the site is well served by sustainable modes of transport, both to and from the site.
- The site will provide a total of six hundred and forty-two cycle spaces, spread across two basement levels and the ground floor.

Overall, the surrounding area benefits from excellent levels of pedestrian and cycling infrastructure and there are plenty of public transport options and amenities within appropriate walking distance of the site.

4.10 Management

In order to minimise the impact of the development during project delivery and construction, whilst providing a safe place to live, the proposals include the following provision:

Project Brief and Design –

Stakeholder consultation covering project delivery and relevant third parties. This will encourage an integrated design process that optimises building performance.

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 throughout the project will be classified as 'legally harvested and traded timber';
- Site related energy and water impacts will be monitored and reported to ensure ongoing compliance during the Construction, Handover and Close Out stages and to improve awareness and understanding for future projects.
- The principal contractor will demonstrate sound environmental management practices and consideration for neighbours across their activities on-site.



5. ENERGY STRATEGY

5.1 Energy Strategy

The energy strategy focuses on a holistic approach to improving the buildings' operational efficiency and carbon dioxide emissions 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 technology.

The design measures outlined in the Energy Strategy comply with the policy requirements stipulated in the Manchester City Council's Core Strategy.

5.1.1 Residential Tower D

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 5.1 presents the fabric parameters proposed for limiting heat loss and improving the building performance of the residential Tower. These may be subject to change following further design reviews as the development progresses through the design stages.

Table 5.1 – Tower D Residential Apartments, Fabric Parameters

Construction Element	Proposed Fabric Specification
Main Wall Type (Curtain Wall)	$U=0.90 \text{ W/m}^2\text{K}$
External Wall (Lift shaft/stairwell)	$U=0.26 \text{ W/m}^2\text{K}$
Windows	$U= 0.90 \text{ W/m}^2\text{K}$, $g= 0.35$ vision Solid purge vent doors
Air Permeability	Between 2.50 & $2.75 \text{ m}^3/\text{hm}^2$ (@50Pa.) ¹

Table 5.2 presents the fabric parameters associated with the non-residential aspects of the Tower. These may be subject to change following further design reviews as the development progresses through the design stages.

¹ Design air permeability target dependent on apartment size



Table 5.2 – Tower D Non-Residential Areas, Fabric Parameters

Construction Element	Proposed Fabric Specification
Main Wall Type (Curtain Wall)	U=1.50 W/m ² K
Internal Wall	U=0.25 W/m ² K
Ground Floor	U=0.12 W/m ² K
Internal Floors	U=0.12 W/m ² K
Roof	U=0.12 W/m ² K
Windows	U= 1.50 W/m ² K, g= 0.40 vision
External Doors	U= 1.50 W/m ² K
Air Permeability	5.00m ³ /hm ² (@50Pa.)

5.1.2 The Lantern Amenity Zone

The lantern amenity zone and restaurant located within the upper levels of Tower D provides a high specification amenity offer of exceptional ambition, design and quality. The design intent is to provide occupiers with a glazed beacon offering unparalleled views over Manchester and beyond, within which a gymnasium and fitness studio, large swimming pool and restaurant facility will be accommodated.

Extensive upfront energy modelling and early engagement with Manchester City Council Building Control at the Concept Design RIBA work stage enabled the design team to determine a technical solution that ensures the two mandatory building regulation Part L Volume 2 (2021) compliance criteria will be achieved by the proposed specification, these being:

- Building carbon dioxide emission rate; and,
- Building primary energy rate.

The proposed lantern specification will incorporate the following design attributes, necessary to limit energy demand and deliver heating, cooling and ventilation within the space:

- High performance façade
 - Triple glazing vision panels
 - Optimised solar gain g value to manage heat gain
 - Low design air permeability
 - High standards of construction and continuity of insulation throughout
 - Limiting cold bridging thermal losses
- High efficiency mechanical and electrical services
 - Heat pumps providing potable water heating
 - Heat pumps (air conditioning) providing space heating and cooling
 - LED lighting throughout
 - Heat recovery ventilation within the swimming pool facility to limit heat loads

The resultant BRUKL compliance results were shared with building control and the principle of a highly energy efficient, 90% glazed lantern amenity facility has been agreed prior to progressing the design to the planning



application stage. The design development will continue further into the development cycle at which stage the exact specifications will be confirmed.

5.1.3 Office Building

Table 5.3 below presents the fabric parameters associated with the adjacent office block, which is part of the planning application for the Tower D Scheme.

Table 5.3 – Fabric Parameters – Office Building

Construction Element	Proposed Fabric Specification
Main Wall Type (Curtain Wall)	U=1.50 W/m ² K
Internal Wall	U=0.25 W/m ² K
Ground Floor	U=0.12 W/m ² K
Internal Floors	U=0.12 W/m ² K
Roof	U=0.12 W/m ² K
Windows	U= 1.50 W/m ² K, g= 0.40 vision
External Doors	U= 1.50 W/m ² K
Air Permeability	5.00m ³ /hm ² (@50Pa.)

These specifications and design attributes will provide the following benefits:

- **High performance thermal insulation** throughout the building envelopes (ensuring very 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, double-glazed windows** will be specified with argon gas fill and low emissivity coatings to limit heat loss through the panes.
- **G-values for the glazing will be specified** to optimise solar gains, but limit the propensity for the buildings to overheat;
- **Low air permeability** of between 2.50 - 2.75m³/hm² (@50Pa.) is targeted for the residential properties. An air permeability of 5.00m³/hm² is targeted for the non-residential aspects of the tower and the office block respectively, 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 around openings and will significantly improve the emission rate of the school.



This design specification for both the residential tower (including the non-residential areas) and the office block will 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 (2021).**

5.1.4 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. The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the buildings is presented in Table 5.4.

Table 5.4 - Mechanical and Electrical Specification – Residential Apartments

Building Elements	Proposed Fabric Specification	
Mechanical Ventilation	1 and 2 Bed Units	3 Bed Units
	MVHR	MVHR
Space Heating	Electric Panel Heaters	
Water Heating	ASHP Hot Water Cylinder	
Water Efficiency	High efficiency fixtures – 105 litres / person / day	
Lighting	LED	

Table 5.5 presents the mechanical and electrical specification for the non-residential areas within Tower D.

Table 5.5 - Mechanical and Electrical Specification – Non-residential Areas

Building Elements	Proposed Fabric Specification
Mechanical Ventilation	MVHR – SFP = 1.2W/l/s, Heat Recovery = 80% (Areas served: Concierge, offices, lounge and co-working lounge, waiting area, meeting areas and staff room)
Space Heating	Electric Panel Heaters
	Areas served: Centralised circulation, toilets and showers
	Air Source Heat Pump Areas served: Concierge, offices, lounge and co-working lounge, waiting area, meeting areas and staff room
Water Heating	Electric point of use
Lighting	LED
Renewable Technology	PV – as required



Table 5.6 presents the mechanical and electric specification proposed for the office block.

Table 5.6 - Mechanical and Electrical Specification – Office Building

Building Elements	Proposed Fabric Specification
Mechanical Ventilation	MVHR – SFP = 1.2, HR = 0.8
	Fan remote from zone – SFP = 0.3
Space Heating	Electric Panel Heaters
	ASHP (Split System)
Water Heating	Electric point of use
Lighting	LED
Renewable Technology	PV

The mechanical and electrical specification associated with each aspect of the scheme will provide the following benefits:

- **Mechanical ventilation with heat recovery (MVHR) systems** will be specified in each apartment unit to maintain a healthy living environment and further reduce the heat losses and the energy demand of the apartments. The design air permeability of 2.50 - 2.75m³/hm² (@50Pa.) for the apartments and 5.00m³/hm² for the non-residential elements, 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;
- **Air Source Heat Pumps** (space and water heating) are a low carbon solution that are ideal for residential and non-residential spaces. They are a highly efficient method of producing heat and hot water. ASHP's collect low-grade heat from the air to supply useful heat for space heating requirements and hot water for water heating requirements by applying additional energy input (in the form of electricity). These will also be used to meet the cooling demand for the non-residential areas of the scheme.
- **Electrical panel heating (for space heating)** generates a reduced overheating potential – electric space heating delivers virtually instantaneous heating at the location it is required, unlike a 'wet system' associated with communal gas boilers which inherently have a long lag time for the heat to be generated and then dissipated when no longer needed. This lag time can lead to the units overheating as the hot water remains in the radiators for a considerable time after the heat demand is required;
- **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.
- **Sophisticated heating controls** including time and temperature zonal controls will ensure the efficient delivery of heat from electric panel heaters to further reduce the apartments' energy demand

The proposed scheme benefits from a 'full electric' energy strategy. Therefore, as the CO₂ footprint of the UK's electricity grid continues to improve, so too will the carbon dioxide emissions associated with the operational phase of the development.

This specification will help to deliver an energy efficient scheme that achieves an emission rate reduction and fabric energy efficiency performance beyond the onerous requirements set by **Building Regulation Part L Approved Document Volume 1 and 2 (2021)**.



6. RENEWABLE ENERGY FEASIBILITY

In order to meet the renewable energy targets stipulated in **Core Strategy Policy EN 4** and the carbon emissions reduction targets stated in **Core Strategy Policy EN 6**, an analysis of the most appropriate renewable energy options has been undertaken to ensure compliance with the adopted policies.

The following renewable energy technologies have been considered for this site, including:

- Solar Hot Water;
- Photovoltaics (PV);
- Wind;
- Heat Pumps; and
- Biomass heating.

A review of the development proposals and site location concludes that the PV option is feasible for this scheme, as detailed below:

✗ **Solar Hot Water** utilises the energy in sunlight and diffuse daylight to heat water for use in buildings. The main component of any solar water heating system is the collector, which absorbs the radiant energy of the sun and converts it to heat energy. This technology is not considered to be a feasible option for this site because there is limited available roof space to accommodate this technology and these solar thermal technologies make only a relatively limited contribution to reducing the building's energy demand and carbon dioxide emissions. Furthermore, there are potential problems associated with routing the pipework through the apartments.

✓ **Photovoltaic (PV) panels** harness solar thermal energy and convert it into electricity which can then be used within a building. The panels may be roof mounted and orientated in a southerly direction to enable this technology to operate efficiently. This technology is considered a viable option for the office block.

✗ **Wind Turbines** are considered unsuitable for this site due to a poor wind resource and lack of space to locate the turbines. Integrating these systems at height on the roof of the blocks is not considered feasible due to the associated noise, vibration and structural stresses upon the building. Furthermore, there are planning issues and perceived safety concerns with this technology.

✗ **Ground Source Heat Pumps** collect low-grade heat from the ground to supply useful heat for space and water heating requirements. By applying additional energy input (in the form of electricity), it is possible to raise the temperature of the source heat to the temperature required. Such technology is considered unsuitable for this site due to an insufficient area (based upon the proposed densities) to install a horizontal ground collector and the prohibitive costs and technical constraint of installing vertical boreholes.

✓ **Air Source Heat Pumps** collect low-grade heat from the air to supply useful heat for space and/or water heating requirements. They operate in the same way as a ground source heat pump, and by applying additional energy input (in the form of electricity) it is possible to raise the temperature of the source heat to the temperature required. The incorporation of ASHP's is a feasible option for both buildings.

✗ **Biomass heating** would be capable of delivering the target CO₂ emission reductions but are considered inappropriate for this type of development and location due to the requirement for a large fuel store and the high NOx emissions associated with biomass combustion which is inappropriate for this urban location.



6.1 Heat Network

The application site is located within a Heat and Energy Network Opportunity Area. However, having reviewed the available information we understand that there are no planned heat networks within the immediate vicinity of the scheme.

The scheme energy strategy incorporates highly energy efficient air source heat pumps within each apartment reducing the need for central risers throughout the building and improving space planning within the building. This energy strategy also benefits from an all-electric system, which delivers instantaneous heating at the location it is required, unlike an alternative 'wet systems' which inherently have a long lag time for the heat to be generated and then dissipated when no longer needed. This lag time can lead to the units overheating as the hot water remains in the radiators for a considerable time after the heat demand is required.

The proposed energy strategy is an effective solution for minimising operational energy intensity and reducing carbon dioxide emissions, which aligns with the requirements of PfE Policy JP-S2 – Carbon and Energy and also Policy JP-S3 – Heat and Energy Networks which promotes the provision of decentralised energy infrastructure through the delivery of renewable and low carbon energy schemes.

6.2 Renewable Energy Solution

6.2.1 Non-Residential Areas - Air Source Heat Pumps

Air source heat pumps will be specified in both the non-residential areas of Tower D and the adjacent office building.

Air source heat pumps collect the warm air as it leaves the building via the ventilation system and then re-uses the heat that would otherwise be lost to the outside to heat fresh air coming into the building or to heat the water. The typical basic components of an air heat pump package comprise a hot water cylinder, heating coil, extractor fan and a heat pump.

The proposed 'intelligent' packaged system provides heating, ventilation and hot water efficiently while giving occupants flexible control over their energy consumption and meeting all space and water heating demands of the occupants.

This solution would provide the following benefits:

- Highly energy efficient, packaged heating systems are provided that are able to deliver both heating and cooling, dependent upon ambient temperatures and comfort requirements;
- This technology benefits from a low 'carbon footprint' due to the inherent efficiency of the heat pump process. It is a well-established technology with an anticipated long lifespan - with proper care they can be operational for up to twenty years;
- Omission of fossil fuel connection from the scheme will enable the development to track the decarbonisations of the UK electricity grid over time and reduce operational carbon emissions as a consequence; and,
- There are no fuel storage issues associated with heat pumps.



6.2.2 Photovoltaics

Photovoltaic (PV) arrays have been selected as an appropriate renewable energy technology to contribute to the CO₂ emission reduction target for the office building alone. PV arrays are relatively straightforward to install, benefit from low maintenance costs and will reduce the operational cost of the building. The use of PV in general would provide the following benefits:

- Reducing the buildings electrical energy grid load;
- Simple installation and commissioning;
- Low maintenance; and,
- Reliable, proven technology.

Proposed System Details -

- It is proposed that PV panels will be mounted upon the flat roof of the office block orientated due south in order to optimise the operating efficiency of the systems;

Land use -

- There are no land use issues associated with PV technology at this site;
- The office block has sufficient roof area to accommodate the proposed PV array; and,

Local Planning Issues -

- There are no planning policy issues associated with this technology.

Noise Issues -

- PV is silent in operation.

Whole life cost and lifecycle impact -

- Current installed costs for PV are approximately £1,500 / kWp installed.
- Additional costs throughout the system's 30-year lifecycle are limited to:
 - Cleaning of the arrays;
 - Potential damage to the arrays; and,
 - Replacement of the DC / AC inverter unit which typically have a lifespan of around 10 years.

6.2.3 Residential Areas - Air Source Heat Pumps

The proposed packaged system that will serve this development will efficiently provide hot water to each apartment.

The basic component of this system are an energy efficient heat pump hot water heater which has an integrated heat pump system on the top and features a duplex stainless steel tank body. This solution would provide the following benefits:

- Highly energy efficient water heating system, thus limiting electrical energy demand and associated carbon dioxide (CO₂) emissions;



- This technology benefits from a low 'carbon footprint' due to the inherent efficiency of the heat pump process. It is a well-established technology with an anticipated long lifespan - with proper care they can be operational for up to twenty years;
- Omission of fossil fuel connection from the proposed scheme will enable the development to track the decarbonisations of the UK electricity grid over time and reduce operational carbon emissions as a consequence; and,
- There are no fuel storage issues associated with heat pumps.

The proposed system provides a high specification of energy efficiency (up to 300%) to ensure the system operates efficiently and to reduce peak electricity demand.

ASHPs primarily consume grid mix electricity which is, in part (albeit diminishing) sourced from a mix of fossil fuels, with increasing proportions of renewable energy and nuclear generation.



7. ENERGY PERFORMANCE CALCULATIONS

7.1.1 Residential Calculations

To demonstrate the environmental benefits associated with the energy strategy for this site, approved SAP 10 software has been used to generate representative energy demand models for the residential components. SAP software calculates the regulated energy demand and associated carbon dioxide emissions in accordance with the requirements of Building Regulation, Part L Approved Document Volume 1 that this development will be constructed in compliance with.

Representative SAP models have been calculated for the residential units presented in Figure 7.1. These were selected for assessment as they constitute a typical floor plate (floor plate Type 01) within the scheme and are representative of the entire site in terms of their size, layout and orientation. The layout of the apartments on this floorplate is repeated through the majority of the scheme, therefore this sample provides a robust indication of the overall performance of the residential element of the proposals.

Figure 7.1 – General Arrangement Plan – Typical Residential Plan Type 1



Table 7.1 below presents a summary of these calculation results, which show the regulated energy demand and emission reductions achieved by the enhanced material specification, efficient servicing, and renewable energy solutions.



Table 7.1 – Calculated Dwelling Emission Rate; Residential Apartments

Representative Building	DER ² (kgCO ₂ /m ² /year)	TER ³ (kgCO ₂ /m ² /year)	% Variance
D Type 1 01 - 001	3.67	12.86	71.46
D Type 1 02 - 001	2.61	13.23	80.27
D Type 1 03 - 001	3.53	12.49	71.74
D Type 1 04 - 001	2.77	11.35	75.59
D Type 1 05 - 001	2.77	11.35	75.59
D Type 1 06 - 001	2.91	11.43	74.54
D Type 1 07 - 001	2.51	12.21	79.44
D Type 1 08 - 001	3.01	11.69	74.25
D Type 1 09 - 001	3.29	12.7	74.09
D Type 1 10 - 001	3.29	12.7	74.09
Average	3.04	12.20	75.11

Table 7.2 – Calculated Dwelling Fabric Energy Efficiency; Residential Apartments

Representative Building	DFEE ⁴ (kWh/m ² /yr)	TTEE ⁵ (kWh/m ² /yr)	% Variance
D Type 1 01 - 001	28.45	28.78	1.15
D Type 1 02 - 001	16.08	22.31	27.9
D Type 1 03 - 001	27.25	27.11	-0.51
D Type 1 04 - 001	19.89	20.94	5.01
D Type 1 05 - 001	19.89	20.94	5.01
D Type 1 06 - 001	21.64	22.27	2.84
D Type 1 07 - 001	12.91	16.97	23.91
D Type 1 08 - 001	22.6	23.29	2.99
D Type 1 09 - 001	25.26	27.2	7.14
D Type 1 10 - 001	25.26	27.2	7.14
Average	21.92	23.70	8.26

² **Dwelling Emission Rate:** The dwelling CO₂ emission rate is expressed as kgCO₂ /(m² ·year) and is calculated using the assessment data entered into SAP.

³ **Target Emission rate:** The maximum CO₂ emission rate for the dwelling, expressed as kgCO₂ /(m² ·year) and determined using the Standard Assessment Procedure. The TER is based upon a notional pre-set building specification.

⁴ **Dwelling Fabric Energy Efficiency Rate:** Expressed as kWh/(m² ·year) and is calculated using the assessment data entered into SAP

⁵ **Target Fabric Energy Efficiency:** The minimum dwelling fabric energy efficiency, expressed as kWh/(m² ·year). FEE is defined as the space heating and cooling requirements per square meter of floor area. It is influenced by heat losses through fabric, ventilation rate, thermal mass, thermal bridging, air tightness and solar gains.



Table 7.3 – Calculated Dwelling Primary Energy Rate; Residential Apartments

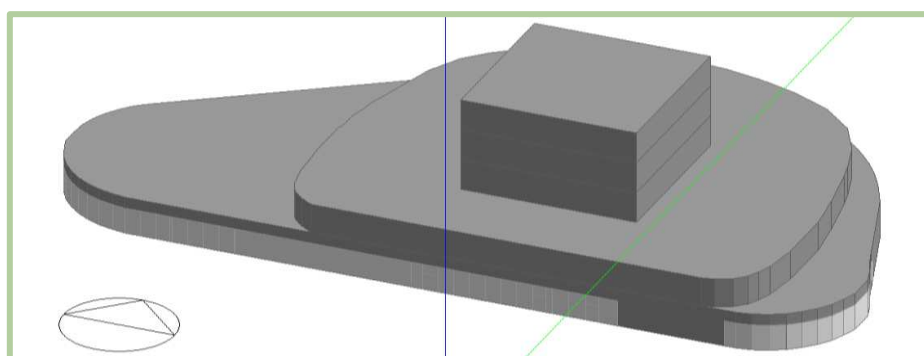
Representative Building	DPER ⁶ (kWh/m ² /yr)	TPER ⁷ (kWh/m ² /yr)	% Variance
D Type 1 01 - 001	38.43	71.38	46.17
D Type 1 02 - 001	27.95	73.8	62.12
D Type 1 03 - 001	36.93	69.39	46.77
D Type 1 04 - 001	29.38	63.3	53.58
D Type 1 05 - 001	29.38	63.3	53.58
D Type 1 06 - 001	30.71	63.67	51.77
D Type 1 07 - 001	27.03	68.33	60.45
D Type 1 08 - 001	31.75	65.12	51.25
D Type 1 09 - 001	34.62	70.56	50.94
D Type 1 10 - 001	34.62	70.56	50.94
Average	32.08	67.94	52.76

The calculations then demonstrate that there is an expected improvement of **75.11% over Part L of the Building Regulations (2021)** for the residential apartments. Thereby significantly reducing carbon emissions in line with PfE Policy JP-S2.

7.1.2 Non-Residential Calculations

To demonstrate the environmental benefits associated with the ‘fabric led’ specification and carbon emissions reduction at the site, approved Simplified Building Energy Model (SBEM) software has been used to generate representative energy demand models of the non-residential aspects of the scheme, to check compliance with Building Regulation, Part L (2021). Representative SBEM energy models have been produced for both the non-residential areas within Tower D, the adjacent office block and the lantern. The 3D models are presented in Figures 7.2 to 7.4 respectively. This analysis provides a robust indication of the overall performance of the non-residential elements of the proposals.

Figure 7.2 – Residential Tower 3D Model



⁶ **Dwelling Primary Energy Efficiency Rate:** Expressed as kWh/(m² · year) and is calculated using the assessment data entered into SAP

⁷ **Target primary energy rate:** The maximum primary energy use for the dwelling in a year, expressed as kWhPE/(m² · year) and determined using the Standard Assessment Procedure.



Figure 7.3 – Indicative Lantern 3D model*Figure 7.4 – Indicative Office Block 3D model*

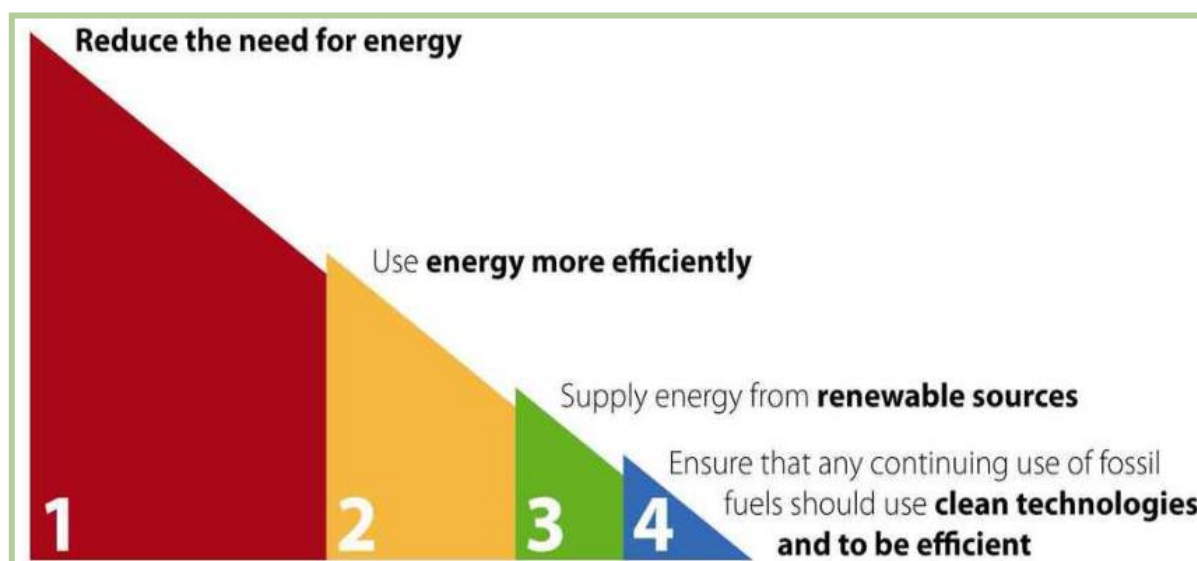
The calculations demonstrate that the scheme is compliant with Part L of the Building Regulations (2021) for the non-residential units assessed and achieve the targets stipulated in CS Policy EN 6.

7.2 Energy Hierarchy

The proposed 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 7.3).

Figure 7.3 – 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;
- Heat gains and losses are balanced to ensure optimised energy performance and thermal comfort for the occupants; and,
- 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. This 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 end, the following measures have been proposed:



- The design air permeability target for the residential building is between $2.50 - 2.75 \text{ m}^3/\text{hm}^2$ (@50Pa.). The air permeability target for the non-residential areas of the residential tower, and also the adjacent office block building, is $5.00 \text{ m}^3/\text{hm}^2$ (@50Pa.). These low air permeability targets will assist in limiting the heat loss through the structure of the buildings;
- 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 risk of overheating, and thereby limiting 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.

Third Principle:

High efficiency heat pumps will deliver space heating requirements for both the non-residential areas within Tower D and the adjacent office block. Photovoltaics will also be installed on the roof of the office block, orientated to due south to maximise efficiency in order to meet the requirements stipulated in Part L, Approved Document Volume 2.

The water heating requirements for the residential dwellings will be delivered by efficient air source heat pumps.

Fourth Principle:

Electric panel heaters which are 100% efficient at the point of consumption. Thereby generating a reduced overheating potential. This is due to the fact that electric space heating delivers virtually instantaneous heating at the location it is required.

Therefore, this all-electric energy strategy which primarily consume grid mix electricity which is, in part sourced from a mix of fossil fuels / LDC and nuclear. The inherent characteristics of the ASHP and electric panel heaters ensures that fossil fuels are consumed efficiently, in accordance with 4th principle of energy hierarchy.

7.3 Decarbonisation

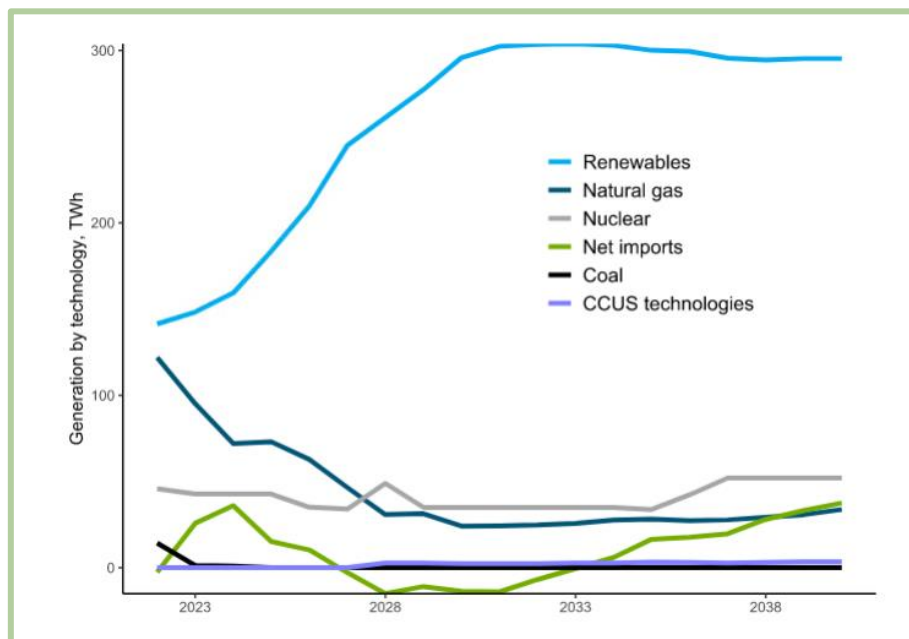
As the UK electricity grid's CO₂ footprint continues to improve, so too would the carbon dioxide emissions associated with the operational phase of the proposed scheme, which benefits from a 'full electric' energy strategy.

UK grid mix electricity carbon emissions will decrease significantly by 2035, with the carbon intensity of electricity generation falling by 93% between 2020 and 2035. This is due to the progressive shift away from fossil fuels as demonstrated in Figure 7.4.

The energy strategy proposed for the scheme uses a combination of a ASHP and electric panel heaters. These are highly efficient systems that utilise grid electricity to provide space and water heating.

The use of heat pumps will ensure that fossil fuels converted and distributed through the National Grid as electrical energy will be consumed cleanly and efficiently.



Figure 7.4 - Electricity generation by Fuel Source, TWh

8. BREEAM

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 8.1 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 'Very Good' 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 'Very Good' rating requires the following minimum performance standards, see Table 8.2.



Table 8.2 – Mandatory ‘Very Good’ Standards

<i>BREEAM NC 2018 Issues</i>	<i>Minimum Standards for BREEAM for 'Very Good' rating</i>
<i>MAN 4: Commissioning and Handover</i>	<i>One credit (commissioning-test schedule and responsibilities)</i>
<i>MAN 4: Commissioning and Handover</i>	<i>Criterion 11 (Building User Guide)</i>
<i>ENE 2: Energy Monitoring</i>	<i>One credit (First sub metering credit)</i>
<i>WAT 1: Water Consumption</i>	<i>One credit</i>
<i>WAT 2: Water Monitoring</i>	<i>Criterion 1 only</i>
<i>MAT 3: Responsible Sourcing of Materials</i>	<i>Criterion 1 only</i>

In addition to mandatory ‘Very Good’ rating criteria, in accordance with the PfE guidance, non-residential developments are expected to achieve at least BREEAM ‘Excellent’ standard (or equivalent) for the ‘Ene 01 – reduction of energy use and carbon emissions’ category.

8.1 Potential BREEAM Rating

BREEAM UK 2018 Non-Domestic New Construction – A BREEAM Pre-Assessment has been prepared for both the retail and office elements of the scheme by a qualified, licensed BREEAM Assessor. This determines the feasible credits and potential BREEAM rating and demonstrates a commitment to the principles of good construction, design and sustainability.

BREEAM Score and Rating – ‘Very Good’

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

The BREEAM Pre-Assessment (presented in the Appendix of this Statement) show that the buildings are expected to perform as follows:

Tower D, Restaurant (Retail) -

- Indicative building BREEAM score = **61%** (*minimum required for BREEAM ‘Very Good’ = 55%*)
- Indicative BREEAM rating = Potential for **BREEAM ‘Very Good’ rating**.



Adjacent Office block –

- Indicative building BREEAM score = **59%** (*minimum required for BREEAM 'Very Good' = 55%*)
- Indicative BREEAM rating = Potential for **BREEAM 'Very Good' rating.**

Following an initial review of the proposals the BREEAM New Construction Pre-Assessment report demonstrates that the proposed development is able, in principle, to meet all mandatory credit requirements and achieve an overall BREEAM 'Very Good' rating for all retail and office units.

Details of the Pre-Assessments can be found in the appendix of this report.

Note that a number of assumptions have been made within this initial appraisal which will require confirmation by means of further technical input during the formal assessment, once the design and specifications are finalised. The approach to achieving the target BREEAM rating may, therefore, be subject to change further into the development cycle.



9. PLACES FOR EVERYONE – POLICY JP-S2

Manchester City Council has now adopted the Places for Everyone Policies, which includes **Policy JP-S2- Carbon and Energy**. This now forms part of the development plan and largely replaces Policy EN6 of the Core Strategy. In support of this, the developer wishes to highlight the following measures that will form part of the energy strategy for this development:

- Materials with a low life cycle cost and embodied carbon will be prioritised where feasible to ensure the long-term impacts from the development can be minimised. In order to measure the environmental impacts of the scheme;
- The scheme is expected to achieve a carbon emissions reduction of 75%, thereby significantly improving upon the Part L compliance requirements and aligning with Future Homes Standard;
- As stated in Sections 4 and 6, the proposed scheme has been designed in accordance with the energy hierarchy, which in order of importance seeks to:
 - i. Minimise energy demand;
 - ii. Maximise energy efficiency;
 - iii. Use renewable energy;
 - iv. Use low carbon energy;
- The proposed development has been assessed against the latest version of Part L Building Regulations (2021) – Approved Document Volume 1;
- It has been determined that there are no existing or proposed heat networks / energy centres within a moderate radius from the development, and there are no existing networks local to the site;
- Table 9.1 and 9.2 below present the energy demand reduction targets as stipulated within the Places for Everyone policy JP-S2 and the results achieved by the representative set of dwellings assessed for the purposes of this energy statement, in terms of:
 - Space heat demand;
 - Hot water energy demand; and,
 - Delivery of on-site renewable energy generation.
- The proposed development will achieve energy demand reductions in terms of space heat demand; hot water energy demand and will provide on-site renewable energy generation in the form of efficient air source heat pumps. This technology is given priority in accordance with Policy JP S2.

Table 9.1 – PfE Targets for Reducing Energy Demand and Onsite Renewable Energy

	Space Heat Demand	Hot Water Energy Demand	Renewable Energy Generation Targets
2021 - 2025	Flats (25kWh/m ²)	20% energy demand reduction in the total heat required for water heating	Photovoltaic installation: 20% ground floorspace



- EV chargers will be provided in accordance with Part S of Building Regulations and also the PfE policy JP S2.

Table 9.2 presents the results of the assessment in terms of space heat and hot water energy demand for the proposed scheme, based upon representative SAP10 energy calculation data.

Table 9.2 – Assessment Results for Reducing Energy Demand and Onsite Renewable Energy

	Space Heat Demand	Hot Water Energy Demand	Renewable Energy Generation Targets
Tower D - Typical Mid Floor Apartment	9.51kWh/m ²	The hot water energy demand will achieve a 20% energy demand reduction as per the SAP calculations.	Air source heat pumps will be installed to meet the renewable energy generation targets.

- Policy JP S2 expects new developments to be net zero carbon by:
 - from adoption – to regulated operational carbon emissions; and
 - from 2028 - to all emissions 'in construction'.

The energy strategy proposed for the scheme uses a combination of air source heat pumps and efficient electrical systems that utilise grid electricity.

The proposed scheme will work towards net zero carbon during operation. This will be achieved through:

1. The specification of air source heart pumps, which is a highly efficient renewable technology, will generate carbon emissions reductions of 75% when assessed against Part L (2021) of Building Regulations.
2. The fully electric energy strategy will also benefit further from the decarbonisation of the grid, which is expected to improve as the percentage of electricity generation from renewable technologies increases (see Figure 7.4).
3. Therefore, the operational CO₂ emissions associated with the proposed scheme are anticipated to decrease in line with these improvements.
4. The proposed energy strategy for the non-domestic zones is also expected to achieve four ENE 01 Credits, in line with PfE Policy JP-S2 requirements.



10. CLIMATE EMERGENCY

A Climate Emergency was declared by Manchester City Council in July 2019, with a target to make Manchester zero-carbon 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 CO₂ emission reductions and renewable energy generation in line with the Energy Hierarchy:
 - In securing compliance with the current, stringent building regulation Part L targets, a commitment is made to construct high quality, energy efficient residential properties which will minimise demand side energy loads – in accordance with the principles of the energy hierarchy.
 - A commitment is made to achieving:
 - Residential - at least an average 75.11% improvement in the emission rate reduction relative to the onerous Part L Approved Document Volume 1 (2021) compliance standards.
 - Non-residential – compliance with the stringent Part L Approved Document Volume 2 (2021) compliance standards.
- Air Source Heat Pumps will be installed to meet the renewable energy requirements.

Furthermore, as the UK's electricity grid CO₂ 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.

Waste is a misuse of natural resources and also contributes a large proportion of the UK's carbon footprint;

- During occupation, the building will benefit from recycling facilities to enable workers and visitors to recycle, in line with the local authority waste reduction targets. Thereby diverting more materials away from landfill and reducing the building's carbon footprint further.

The proposed development will demonstrate resilience to potential climate change effects through cycle storage facilities and access to local sustainable modes of transport:

- This is facilitated by:
 - Secure cycle storage provision;
 - Local access to transport nodes for bus and rail; and,
 - Local amenities that are within easy walking distance of the site, enabling residents to support local businesses with a reduced need to travel.

The buildings are designed to incorporate features that will serve to reduce energy demand, and in turn, carbon emissions arising from access to the building:

- Low energy lighting; and,
- Sophisticated time and temperature controls.

These commitments will assist Manchester City Council in meeting their Climate Change Emergency objectives.



11. CONCLUSION

This statement has reviewed the sustainability performance of the proposed mixed use scheme against national and local planning policies. The material specification and servicing strategy for the scheme and the building (carbon dioxide) emission rates for the various uses throughout the development has also been reviewed. The conclusion that may be drawn from the process is as per the following:

Sustainability Performance –

- The BREEAM Pre-Assessments demonstrate that both the restaurant within Tower D, and the adjacent office block, are expected to achieve an indicative **BREEAM rating of 'Very Good'** in accordance with **Core Strategy Policy DM1**.
- Water consumption of the development will be minimised through **the specification of efficient water fixtures in line with Policy JP-S4 - Flood Risk and the Water Environment**.
- 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 access to regular busses will contribute towards creating a highly connected and sustainable development.
- The development site is located within Flood Risk Zone 1. Post development surface water run-off rates will be **managed and mitigated through the implementation of SUDs** where applicable, in accordance with **CS Policy EN14**.
- Waste arising during construction and occupation/operation will be minimised through the **implementation of a Site Waste Management Plan (SWMP)** in accordance with **CS Policy EN19**. The SWMP will be used to ensure that there is adequate management and storage of construction waste in line with the Council's policies. Opportunities for the possible recycling of construction from excavation works will also be considered in line with best practice.
- **A refuse management strategy** has been developed to manage waste and recyclables from the operational phase of the development in accordance with **CS Policy EN19 and PfE Policy JP-P1 - Sustainable Places**. Source segregation and the provision of refuse areas will encourage individuals to recycle and **divert waste away from landfills**.
- Materials are proposed to be **responsibly and locally sourced where practically feasible**. Material selection will be carefully considered to avoid the use of toxic materials and materials with VOCs.
- The developer has committed to **implement ecological enhancement measures** in accordance with **CS Policy EN15 and PfE Policy JP-G8**.

Energy 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**, efficient mechanical and electrical systems and sophisticated controls will achieve compliance with the emission reduction targets stipulated by **Building Regulations Part L Approved Document Volume 1 and 2 (2021)**, which align with those stipulated in **CS Policy EN4**.



- Several measures have been implemented to ensure that the proposed specification aligns with the Places for Everyone Policy JP S2, and regulated (building regulation, Part L) carbon dioxide emissions have been calculated.
 - This is a fossil fuel free development, efficiently utilising electricity drawn from the UK's decarbonising grid. Thus, securing a trajectory towards operational zero carbon for the dwellings.
- Both the non-residential areas within the residential tower and the adjacent office block will incorporate **air source heat pumps** to meet all space heating requirements. These systems are extremely energy efficient and will play a significant role in reducing the development's carbon footprint;
- The residential dwellings within the residential tower will incorporate **air source heat pumps** to meet the apartments water heating requirements;
- All aspects of the scheme **meet the required carbon emissions reduction targets** stipulated in **CS Policy EN4**, by achieving the following:
 - The residential apartments are expected to achieve a **75% emissions reduction** over **Part L Approved Document Volume 1 of the Building Regulations**.
 - The non-residential aspects of the scheme will comply with **Building Regulations, Part L Approved Document Volume 2**.
 - The adjacent office block will comply with building regulations, **Part L Approved Document Volume 2**.
 - The proposed energy strategy for the non-domestic zones is also expected to achieve four ENE 01 Credits, in line with **PfE Policy JP-S2** requirements.
- The scheme will minimise and **control the risk of overheating** in accordance with **Core Strategy Policy EN8 and Part O of the Building Regulations**.

Furthermore, the proposals accord with the aims of the National Planning Policy Framework, as follows:

- The re-use of this piece of brownfield land in a highly accessible, urban location will provide a development that inherently supports sustainable living, with access to local amenities and sustainable modes of transport;
- Construction practices that minimise adverse impacts on the environment will be adhered to including a waste management strategy to reduce the quantity of waste generated, and to increase re-use and recycling; and,
- Exceeding the regulatory Part L compliance criteria will assist in lessening the impact of this development on the environment by the way of reducing carbon emissions.

The proposals reviewed within this statement for the Plot D mixed use scheme at Great Jackson Street 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 – Restaurant BREEAM Pre Assessment





ELEMENT
SUSTAINABILITY

CROWN STREET, TOWER D **MANCHESTER,**

BREEAM New Construction 2018 **RETAIL PRE-ASSESSMENT REPORT**

REF: 2022.176



BREEAM 2018 New Construction Criteria (NC)

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Contents

Executive Summary	1
BREEAM Methodology	1
BREEAM Rating.....	1
Minimum Standards	1
RIBA Sensitive Credits.....	2
BREEAM New Construction Pre-assessment (Table 1.2).....	3

BREEAM PRE-ASSESSMENT OVERVIEW

Executive Summary

Element Sustainability Ltd have been appointed by Renaker Build Limited to complete an assessment of the retail space of the proposed development under the Building Research Establishment Environmental Assessment Methodology (BREEAM). This pre-assessment review report gives an indication of the expected BREEAM score and rating for the development that may be achieved when the final assessment is submitted to the Building Research Establishment (BRE), based on the information provided at this pre-assessment stage.

The development proposals include the construction of a mixed-use scheme Crown Street Tower D, Manchester. The mixed used scheme will provide a restaurant space on the upper floor levels, which this report will assess.

BREEAM Methodology

The BREEAM UK New Construction 2018 scheme can be used to assess the environmental life cycle impacts of new non-domestic buildings at the design and construction stages. 'New Construction' is defined as development that results in a new standalone structure, or new extension to an existing structure, which will come into operation or use for the first time upon completion of the works.

A BREEAM pre-assessment report has been prepared by a qualified and licensed BREEAM Accredited Professional to demonstrate the feasibility of achieving the desired BREEAM ratings for the new build scheme. The initial pre-assessment report details the possible strategies to be employed.

The BREEAM assessment methodology applicable to this development is as follows:

- BREEAM UK 2018 Non-Domestic New Construction (Retail) – Shell Only

BREEAM Rating

A review of the current development proposals has been carried out against the BREEAM UK 2018 New Construction assessment methodology. It is anticipated that the scheme's design has the potential to score 61.36% (minimum score level for BREEAM 'Very Good' rating is 55%), see Table 1.2 below.

Minimum Standards

The minimum standards for the BREEAM 'Very Good' rating are provided within Table 1.1 of this report and highlighted within Table 1.2. To achieve a particular level of performance the majority of BREEAM credits can be traded, i.e. non-compliance in one area can be off set through compliance in another to achieve the target BREEAM rating.

To ensure that performance against fundamental environmental issues is not overlooked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Table 1.1 - Minimum Standards

BREEAM NC 2018 Issues	Minimum Standards for BREEAM for 'Very Good' rating
MAN 4: Commissioning and Handover	One credit (commissioning-test schedule and responsibilities)
MAN 4: Commissioning and Handover	Criterion 11 (Building User Guide)
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

RIBA Sensitive Credits

There are a number of BREEAM credits that need to be addressed at particular RIBA Stage. These credits have been highlighted in Yellow within Table 1.2 below.



BREEAM 2018 New Construction Criteria (NC)

Page 3

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

BREEAM New Construction Pre-assessment (Table 1.2)

Issue	Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Management				
Man 1 – Project Brief and Design				
Man 1a	Project Delivery Planning	1	1	Design Team
A clear sustainability brief is developed prior to Concept Design AND prior to completion of the Concept Design (RIBA Stage 2 or equivalent) , the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.				
The project team demonstrate how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.				
Man 1b	Stakeholder Consultation (Third Party)	1	1	Design Team
Prior to completion of the Concept Design , the design team consult with all interested parties on matters that cover the minimum consultation content.				
Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.				
Prior to completion of the Detailed Design (RIBA Stage 4, Technical Design or equivalent) , all interested parties give and receive consultation feedback.				
Pre-req.	Pre-requisite	-	-	Design Team
Credit Not Sought The project team, including the client, formally agree strategic performance targets early in the design process (Concept Design), (with the support of the BREEAM AP where appointed).				



BREEAM 2018 New Construction Criteria (NC)

Page 4

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 1c	BREEAM AP (Concept Design)	1	0	BREEAM AP	Credit Not Sought Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. b. Monitor progress against the performance targets agreed throughout all stages after their appointment, where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.
Man 1d	BREEAM AP (Developed Design)	1	0	BREEAM AP	Credit Not Sought Involve the BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout Developed Design. b. Monitor progress against the performance targets agreed throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue	Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 2 - Life Cycle Cost and Service Life Planning				
Man 2a	Elemental LCC	2	0	Cost Consultant
Credit Not Sought A competent person (see Definitions on the facing page) carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865: 2008. The elemental LCC plan: a. Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20, 30, 50 or 60 years); b. Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the client, in line with the design life expectancy of the building.				
Man 2b	Component LCC	1	1	Cost Consultant
A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865: 2008. The component level LCC includes (where present): a. Envelope, e.g. cladding, windows, or roofing b. Services, e.g. heat source, cooling source, or controls c. Finishes, e.g. walls, floors or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection. The Component level LCC option appraisal should review all of the above component types (where present). However, you do not need to consider every single example cited under each component; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of options are considered and help focus the analysis on components which would benefit the most from appraisal. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.				
Man 2c	Capital Cost Reporting	1	1	Client or Project Manager
The capital cost to be reported for the project £/m ² .				



BREEAM 2018 New Construction Criteria (NC)

Page 6

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 3 - Responsible Construction Practices					
Man 3 (P)	Timber Procurement (M)	Pre-Req	Pre-Req	Main Contractor	Main contractor to ensure that all timber is legally harvested and trade timber.
Man 3a	Environmental Management	1	0	Main Contractor	Credit Not Sought Main Contractor to operates ISO 14001 and implements pollution prevention procedures on site in line with PPG6.
Man 3b	BREEAM AP	1	1	Sustainability Champion	Involve a BREEAM AP in the project at an appropriate level (Manufacturing and Construction) .
Man 3c	Responsible Construction Management	2	1	Main Contractor	The Main Contractor to register with CCS and achieve a score of beyond compliance or confirm compliance with the marked items of Table 4.1 in the BREEAM technical manual for one credit plus six additional items.
Man 3d	Monitoring of Construction site Impacts (Energy and Water)	1	1	Main Contractor	Main Contractor sets targets, monitors and reports on energy and water consumption each month, based on site activities.
Man 3e	Monitoring of Construction Site Impacts (Transport)	1	1	Main Contractor	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.
Man 4 - Commissioning and Handover					
Man 4a	Commissioning, Testing Schedule and Responsibilities	-	-	-	Credit not applicable to Shell Only
Man 4b	Commissioning – Design and Preparation	-	-	-	Credit not applicable to Shell Only



BREEAM 2018 New Construction Criteria (NC)

Page 7

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 4c	Testing and Inspecting Building Fabric	1	1	Main Contractor	Complete post construction testing and inspection to quality-assure the integrity of the building fabric. A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard. Rectify any defects identified during post-construction testing and inspection prior to building handover.
Man 4d	Handover	-	-	-	Credit not applicable to Shell Only
Health and Wellbeing					
Hea 1 - Visual Comfort					
Hea 1b	Daylighting	2	2	Daylight Consultant	Daylighting criteria have been met using either of the following options: a. The relevant building areas meet good practice daylight factors and other criteria as outlined in Table 5.1 of the NC 2018 Technical Manual. and Table 5.2 of NC 2018 Technical Manual OR b. The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table 5.3 of NC 2018 Technical Manual.
Hea 1c	View Out	1	1	Architect	95% of the floor area in 95% of spaces for each relevant building area provides an adequate view out.
Hea 1d	External Lighting	1	1	M&E	External Lighting – All external lighting located within the construction zone is specified in accordance with BS 5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting – Lighting of work places – Part 2: Outdoor work places. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. Where no external light fittings are specified (either separate from or mounted on the external building façade or roof), the criteria relating to external lighting do not apply and



BREEAM 2018 New Construction Criteria (NC)

Page 8

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					the credits can be awarded on the basis of compliance with criteria 7-8. If no internal lighting is specified the credit cannot be awarded.
Hea 4 – Thermal Comfort					
Hea 4a	Thermal Modelling	-	-	-	Credit not applicable to Shell Only
Hea 4b	Design for Future Thermal Comfort	-	-	-	Credit not applicable to Shell Only
Hea 5 - Acoustic Performance					
Hea 5a	Acoustic Performance	1	1	Acoustician	Shell Only Specific Criteria: Criteria - Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014 Testing requirement - A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology section of the BREEAM Technical Manual
Hea 6 - Safety and Security					
Hea 6	Security of Site and Building	1	1	Architect/ALO	A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent) . The SQSS develops a set of recommendations or solutions during or prior to Concept Design (RIBA Stage 2 or equivalent) . These recommendations or solutions aim to ensure that the design of buildings, public and private car parks and public or amenity space are planned, designed and specified to address the issues identified in the preceding SNA. The recommendations or solutions proposed by the SQSS are implemented. Any deviation from those recommendations or solutions will need to be justified, documented and agreed in advance with a suitably qualified security specialist.
Hea 7 – Safe and Healthy Surroundings					
Hea 7a	Safe Access	1	1	Architect/Landscape Architect	Where external site areas form part of the assessed development the following apply: 1. Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. 2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following:



BREEAM 2018 New Construction Criteria (NC)

Page 9

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space d. Connecting to off-site paths where applicable 3. Pedestrian drop off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths. Where vehicle delivery access and drop off areas form part of the assessed development, the following apply; 4. Delivery areas are not accessed through general parking areas and do not cross or share the following: a. Pedestrian and cyclist paths b. Outside amenity areas accessible to building users and general public 5. There is dedicated parking or waiting area for goods vehicles with appropriate Separation from the manoeuvring area and staff and visitor car parking. 6. Parking and turning areas are designed for simple manoeuvring according to the type of vehicle likely to access the site, thus avoiding the need for repeated shunting.
Hea 7b	Outside Space	1	1	Architect/Landscape Architect	There is an outside space providing building users with an external amenity area.
Energy					
Ene 1 - Reduction of CO2 Emissions					
Ene 1	Reduction of CO ₂ Emissions	9	5	Energy Assessor	5no. assumed credits – And EPR_{NC} of 0.5 a performance improvement better than the relevant national building regulations compliant standard.
Ene 2 – Energy Monitoring					
Ene 2a	Sub-metering of end-use categories	-	-	-	Credit not applicable to Shell Only



BREEAM 2018 New Construction Criteria (NC)

Page 10

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Ene 2b	Sub-metering of high energy load and tenancy areas	-	-	-	Credit not applicable to Shell Only
Ene 3 - External Lighting					
Ene 3	External Lighting	1	1	M&E	The average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 luminaire lumens per circuit Watt. All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.
Ene 4 - Low Carbon Design					
Ene 4a	Passive Design Analysis	1	1	M&E / Energy Assessor	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. The project team analyses the proposed building design and development during Concept Design 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. Quantify the reduced total energy demand and carbon dioxide (CO₂-eq) emissions resulting from the passive design measures.
Ene 4b	Free Cooling	1	0	M&E / Energy Assessor	Credit Not Sought Achieve the passive design analysis credit. Include a free-cooling analysis in the passive design analysis carried out under criterion 2. Identify opportunities for the implementation of free cooling solutions. The building is naturally ventilated or uses any combination of the free cooling strategies listed in the Free Cooling analysis.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Ene 4c	LZC Technologies	1	1	M&E / Energy Assessor	An energy specialist (see Definitions on page 157) completes a feasibility study (see Low and zero carbon feasibility study on the next page) by the end of Concept Design . Establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy sources for the building or development based on the feasibility study. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. Quantify the reduced regulated carbon dioxide (CO ₂ -eq) emissions resulting from the feasibility study.
Ene 6 - Energy Efficient Transportation Systems					
Ene 6a	Energy Consumption	-	-	Lift Supplier	Credit not applicable and there is no lift specified for the retail unit For specified lifts, escalators or moving walks (transportation types): 1a. Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators or moving walks. 1b. Calculate the energy consumption in accordance with BS EN ISO 25745 Part 2 or Part 3 for one of the following: 1bi. At least two options for each transportation type (e.g. for lifts, hydraulic, traction or machine room-less (MRL) OR 1bii. At least two options considering different system arrangements and control Strategies. 1c. Consider the use of regenerative drives, subject to the requirements in Regenerative drives contained in the BREEAM Technical Manual. 1d. Specify the transportation system with the lowest energy consumption.
Ene 6b	Energy Efficient Features – Lifts	-	-	Lift Supplier	Credit not applicable and there is no lift specified for the retail unit Achieve Criterion 1 above. Specify the following three energy efficient features for each lift: a. A standby condition for off-peak periods. b. The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of >70 luminaire lumens per circuit Watt. c. Use of drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. Specify regenerative drives where their use is demonstrated to save energy.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Transport					
Tra 1 - Transport assessment and travel plan					
Tra 1	Transport Assessment and Travel plan	2	2	BREEAM Assessor	No later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form; The site-specific travel assessment (or statement) shall cover as a minimum: a: If relevant, travel patterns and attitudes of existing building or site users towards cycling, walking and public transport, to identify relevant constraints and opportunities. b: Predicted travel patterns and transport impact of future building or site users. c: Current local environment for pedestrians and cyclists, accounting for any age-related requirements of occupants and visitors. d: Reporting of the number and type of existing accessible amenities, within 500m of the site. e: Disabled access accounting for varying levels and types of disability, including visual impairment. f: Calculation of the existing public transport Accessibility Index (AI), g: Current facilities for cyclists. Following a transport assessment, a site-specific travel plan that provides a long-term management strategy which encourages more sustainable travel will be produced. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation. If the occupier is known, involve them in the development of the travel plan. Demonstrate that the travel plan will be implemented and supported by the building's management in operation.
Tra 2 – Sustainable Transport Measures					
Tra 2 (p)	Pre-Requisite	Pre-Req	Pre-Req	BREEAM Assessor	Achieve criteria 3-5 in the Tra 01 Transport Assessment and travel plan.
Tra 2	Transport Options Implementation	10	5	BREEAM Assessor	BREEAM Assessor Notes Sustainable transport measures are incorporated into the development as follows: - Install compliant cycle storage spaces to meet the minimum levels set out in Table 7.5. 4 total spaces Spaces are publicly accessible within proximity of a main building entrance. Compliant cyclists facilities are needed for staff only and covered overhead



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					- AI over 8 - At least three existing amenities are present, see Table 7.6 - Enhanced amenities in the form of an appropriate food outlet or leisure facility
Water					
Wat 1 - Water Consumption					
Wat 1	Water Consumption	-	-	-	Credit not applicable to Shell Only
Wat 2 - Water Monitoring					
Wat 2	Water Monitoring MINIMUM STANDARD	1	1	M&E	The specification of a water meter on the mains water supply to the building Each meter (main and sub) has a pulsed or other open protocol communication output to enable connection to an appropriate utility monitoring and management system. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area.
Wat 3 - Water Leak Detection and Prevention					
Wat 3a	Leak Detection System	1	1	M&E	A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be: a. A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks is installed. b. Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. d. Programmable to suit the owner/occupiers' water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Wat 4 - Water Efficient Equipment					
Wat 4	Water Efficient Equipment	1	1	Landscape Architect	Identify all water demands from uses other than those listed under Calculation of Water Efficiency Performance that could be realistically mitigated or reduced. Where there is no water demand from uses other than domestic scale, sanitary use components in the building, this issue is not applicable. Identify systems or processes to reduce the relevant water demand and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.
Materials					
Mat 1 Environmental impacts from construction products - Building life cycle assessment (LCA)					
Mat 1	Environmental Impacts from Construction products - Building Life Cycle Assessment (LCA)	7	0	Architect/Structural Engineer	Credit Not Sought Creation of Life Cycle Assessments during Concept Design , and integrating its outcomes in the design decision-making process.
Mat 2 - Environmental impacts from construction products – Environmental Product Declarations (EPD)					
Mat 2	Environmental Impacts from Construction Products – (EPD)	1	1	Architect/Structural Engineer	Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the Methodology below.
Mat 3 - Responsible Sourcing of Materials					
Mat 3a	Timber Procurement MINIMUM STANDARD	Pre-Req.	Pre-req.	Main Contractor	All timber used on site will be sourced in accordance with the UK Government's Timber Procurement Policy.
Mat 3b	Enabling Sustainable Procurement	1	1	Main Contractor	During the Preparation and Briefing stage, the principal contractor sources materials for the project in accordance with a documented sustainable procurement plan
Mat 3c	Measuring Responsible Sourcing	3	1	Main Contractor	Key building materials are responsibly sourced to reduce environmental and socio-economic impacts.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Mat 5 - Designing for Robustness					
Mat 5	Designing for Robustness	1	1	Architect	Protecting vulnerable parts of the building from damage 1. 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: a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. Protecting exposed parts of the building from material degradation Environmental factors have been identified that are relevant to the site location. Existing applicable building elements that are exposed to any relevant environmental factors have been identified. 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 to be 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. Newly specified materials or newly constructed elements (e.g. a new external wall) within the scope of works incorporate appropriate design and specification measures to limit material degradation due to environmental factors.
Mat 6 – Material Efficiency					
Mat 6	Material Efficiency	1	0	Design Team / Architect	Credit Not Sought At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages. Preparation and Brief Concept Design Developed Design



BREEAM 2018 New Construction Criteria (NC)

Page 16

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					Technical Design Construction. Develop and record the implementation of material efficiency, during: Developed Design Technical Design Construction. Report the targets and actual material efficiencies achieved.
Waste					
Wst 1 - Construction Waste Management					
Wst 1a	Pre-Demolition Audit	-	-	Developer	Understood Demolition is not applicable During Concept Design , complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition.
Wst 1b	Construction Resource Efficiency	3	2	Main Contractor	Produce a Resource Management Plan (RMP) covering non-hazardous waste materials, including demolition and excavation waste. Record data on waste arisings and waste management routes. The waste generated per 100m ² (GIFA) is: ≤ 7.5 m³ (actual, not bulk volume) ≤ 6.5 tonnes
Wst 1c	Diversion of Waste from Landfill	1	1	Main Contractor	Targets and procedures will be put in place to ensure that over 70% by volume / 80% by weight of construction waste generated is diverted from landfill and that materials will be sorted into key waste groups.
Wst 2 -Recycled Aggregates					
Wst 2a	Pre-Requisite	Pre-req	Pre-req	Main Contractor	Credit Not Sought If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Criterion 1 and 2 of Wst 01.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Wst 2b	Project Sustainable Aggregates	1	0	Main Contractor	Credit Not Sought - Identify all aggregate uses and types on the project - Determine the quantity in tonnes for each identified use and aggregate type. - Identify the region in which the aggregate source is located. - Calculate the distance in kilometres travelled by all aggregates by transport type Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points.
Wst 3 - Operational Waste					
Wst 3	Operational Waste	1	1	Architect/ building Owner	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: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors 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. Where food waste is to be generated a water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.
Wst 5 – Adaptability to Climate Change					
Wst 5a	Resilience of Structure, Fabric, Building Services and Renewables Installation	1	1	Architect / Structural Engineer	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: 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: • Hazard identification • Hazard assessment



BREEAM 2018 New Construction Criteria (NC)

Page 18

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					• Risk estimation • iv. Risk evaluation • Risk management.
Wst 5 Ex	Responding to Climate Change	1	0	Architect / Structural Engineer	Credit Not Sought All of the following credits are achieved: - Hea 04 Thermal comfort - Criterion 6 - Ene 01 Reduction of energy use and carbon emissions - A minimum of six credits - Ene 04 Low carbon design - The passive design analysis credit - Wat 01 Water consumption - A minimum of three credits - Mat 05 Designing for durability and resilience - Criteria 2–4 Pol 03 Flood and surface water management - Flood resilience: a minimum of one credit Surface water run-off: two credits
Wst 6 – Design for disassembly and adaptability					
Wst 6	Functional Adaptability	2	2	Architect / Structural Engineer	A building-specific functional adaptation strategy study to be undertaken by the client. Functional adaptation measures have been adopted in the design by Technical Design stage (RIBA Stage 4 or equivalent) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor
Land Use and Ecology					
Le 1 – Site Selection					
Le 1a	Site Selection	1	1	Architect	At least 75% of the proposed development is on previously developed land.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Le1b	Contaminated Land	1	0	Contaminated Land Specialist	Credit Not Sought BREEAM Assessor Notes – If land is deemed to be contaminated credit is applicable – Design Team to advise A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified: - The degree of contamination - The contaminant sources or types - The options for remediating sources of contamination which present an unacceptable risk. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional.
Le 2 - Identifying and understanding the risks and opportunities for the project					
Le 2	Ecological Risks and Opportunities for the Project	2	2	Ecologist / Design Team	During Concept Design , Identify and understand the ecological risks and opportunities associated with the site to inform the determination of the strategic outcome for the site.
Le 3 - Managing negative impacts on ecology					
Le 3	Managing Negative Impacts on Ecology	3	2	Ecologist / Design Team / Contractor	Recognition of steps taken to avoid impacts on existing site ecology as far as possible.
Le 4 - Change and enhancement of ecological value					
Le 4	Change and Enhancement of Ecological Value	4	2	Ecologist / Design Team / Main Contractor	Recognition of steps taken to avoid impacts on existing site ecology as far as possible.



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
LE 5 - Long term ecology management and maintenance					
Le 5	Long Term Ecology Management and Maintenance	2	2	Ecologist/ Main Contractor	Encouraging the long-term maintenance and management of ecology on site to ensure both new and existing ecological features continue to thrive.
Pollution					
Pol 1 – Impact of Refrigerants					
Pol 1a	Impact of Refrigerants	-	-	-	Credit not applicable to Shell Only
Pol 1b	Leak Detection	-	-	-	Credit not applicable to Shell Only
Pol 2 – Local Air Quality					
Pol 2	Local Air Quality	-	-	-	Credit not applicable to Shell Only
Pol 3 Surface Water Run-Off					
Pol 3a	Flood Risk	2	2	Flood Risk Specialist	Flood Risk Zone 1 – A flood risk assessment been completed during Concept Design for the development.
Pol 3b	Surface Water Run-off (Rate)	1	1	Drainage Consultant	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 pre-development site. This should comply at the 1-year and 100-year return period events. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place. Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance.
Pol 3c	Surface Water Run-off (Volume)	1	1	Drainage Consultant	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



Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques. Where the man-made impermeable area draining to the watercourse (natural or municipal) has decreased or remains unchanged post-development, the volume of run-off requirements (criteria 11-16) can be considered as met. Volume calculations will not be provided. Instead, drawings clearly showing the impermeable areas of the site draining to the watercourse should be provided for the pre and post development scenarios. Figures must also be given (ideally on the drawings) to show a comparison between the areas of drained impermeable surfaces pre and post development.
Pol 3d	Minimising Watercourse Pollution	1	1	Drainage Consultant	There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant). Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. 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. 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. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual 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. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.
Pol 4 – Reduction of Night-time Light Pollution					
Pol 4	Reduction of Night-time Light Pollution	1	1	M&E	The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for



BREEAM 2018 New Construction Criteria (NC)

Page 22

Project: Crown Street Tower D (Retail)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					the reduction of obtrusive light, 2011. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. Where specified, illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.
Pol 5 – Reduction of Noise Pollution					
Pol 5	Reduction of Noise Pollution	-	-	-	Credit not applicable to Shell Only



Appendix B – Office BREEAM Pre Assessment





ELEMENT
SUSTAINABILITY

CROWN STREET, TOWER D **MANCHESTER,**

BREEAM New Construction 2018 **OFFICE PRE-ASSESSMENT REPORT**

REF: 2022.176



BREEAM 2018 New Construction Criteria (NC)

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Contents

Executive Summary	1
BREEAM Methodology	1
BREEAM Rating.....	1
Minimum Standards	1
RIBA Sensitive Credits.....	2
BREEAM New Construction Pre-assessment (Table 1.2).....	3

BREEAM PRE-ASSESSMENT OVERVIEW

Executive Summary

Element Sustainability Ltd have been appointed by Renaker Build Limited to complete an assessment of the retail space of the proposed development under the Building Research Establishment Environmental Assessment Methodology (BREEAM). This pre-assessment review report gives an indication of the expected BREEAM score and rating for the development that may be achieved when the final assessment is submitted to the Building Research Establishment (BRE), based on the information provided at this pre-assessment stage.

The development proposals include the construction of a mixed-use scheme Crown Street Tower D, Manchester. The mixed used scheme will provide office space within the Marketing Suite building, which this report will assess.

BREEAM Methodology

The BREEAM UK New Construction 2018 scheme can be used to assess the environmental life cycle impacts of new non-domestic buildings at the design and construction stages. 'New Construction' is defined as development that results in a new standalone structure, or new extension to an existing structure, which will come into operation or use for the first time upon completion of the works.

A BREEAM pre-assessment report has been prepared by a qualified and licensed BREEAM Accredited Professional to demonstrate the feasibility of achieving the desired BREEAM ratings for the new build scheme. The initial pre-assessment report details the possible strategies to be employed.

The BREEAM assessment methodology applicable to this development is as follows:

- BREEAM UK 2018 Non-Domestic New Construction (Office) – Shell and Core

BREEAM Rating

A review of the current development proposals has been carried out against the BREEAM UK 2018 New Construction assessment methodology. It is anticipated that the scheme's design has the potential to score 59.67% (minimum score level for BREEAM 'Very Good' rating is 55%), see Table 1.2 below.

Minimum Standards

The minimum standards for the BREEAM 'Very Good' rating are provided within Table 1.1 of this report and highlighted within Table 1.2. To achieve a particular level of performance the majority of BREEAM credits can be traded, i.e. non-compliance in one area can be off set through compliance in another to achieve the target BREEAM rating.

To ensure that performance against fundamental environmental issues is not overlooked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Table 1.1 - Minimum Standards

BREEAM NC 2018 Issues	Minimum Standards for BREEAM for 'Very Good' rating
MAN 4: Commissioning and Handover	One credit (commissioning-test schedule and responsibilities)
MAN 4: Commissioning and Handover	Criterion 11 (Building User Guide)
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

RIBA Sensitive Credits

There are a number of BREEAM credits that need to be addressed at particular RIBA Stage. These credits have been highlighted in **Yellow** within Table 1.2 below.



BREEAM 2018 New Construction Criteria (NC)

Page 3

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

BREEAM New Construction Pre-assessment (Table 1.2)

Issue	Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Management				
Man 1 – Project Brief and Design				
Man 1a	Project Delivery Planning	1	1	Design Team
A clear sustainability brief is developed prior to Concept Design AND prior to completion of the Concept Design (RIBA Stage 2 or equivalent) , the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.				
The project team demonstrate how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.				
Man 1b	Stakeholder Consultation (Third Party)	1	1	Design Team
Prior to completion of the Concept Design , the design team consult with all interested parties on matters that cover the minimum consultation content.				
Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.				
Prior to completion of the Detailed Design (RIBA Stage 4, Technical Design or equivalent) , all interested parties give and receive consultation feedback.				
Pre-req.	Pre-requisite	-	-	Design Team
Credit Not Sought The project team, including the client, formally agree strategic performance targets early in the design process (Concept Design), (with the support of the BREEAM AP where appointed).				



BREEAM 2018 New Construction Criteria (NC)

Page 4

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 1c	BREEAM AP (Concept Design)	1	0	BREEAM AP	Credit Not Sought Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. b. Monitor progress against the performance targets agreed throughout all stages after their appointment, where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.
Man 1d	BREEAM AP (Developed Design)	1	0	BREEAM AP	Credit Not Sought Involve the BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout Developed Design. b. Monitor progress against the performance targets agreed throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue	Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 2 - Life Cycle Cost and Service Life Planning				
Man 2a	Elemental LCC	2	0	Cost Consultant
Credit Not Sought A competent person (see Definitions on the facing page) carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865: 2008. The elemental LCC plan: a. Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20, 30, 50 or 60 years); b. Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the client, in line with the design life expectancy of the building.				
Man 2b	Component LCC	1	1	Cost Consultant
A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865: 2008. The component level LCC includes (where present): a. Envelope, e.g. cladding, windows, or roofing b. Services, e.g. heat source, cooling source, or controls c. Finishes, e.g. walls, floors or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection. The Component level LCC option appraisal should review all of the above component types (where present). However, you do not need to consider every single example cited under each component; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of options are considered and help focus the analysis on components which would benefit the most from appraisal. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.				
Man 2c	Capital Cost Reporting	1	1	Client or Project Manager
The capital cost to be reported for the project £/m ² .				



BREEAM 2018 New Construction Criteria (NC)

Page 6

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 3 - Responsible Construction Practices					
Man 3 (P)	Timber Procurement (M)	Pre-Req	Pre-Req	Main Contractor	Main contractor to ensure that all timber is legally harvested and trade timber.
Man 3a	Environmental Management	1	0	Main Contractor	Credit Not Sought Main Contractor to operates ISO 14001 and implements pollution prevention procedures on site in line with PPG6.
Man 3b	BREEAM AP	1	1	Sustainability Champion	Involve a BREEAM AP in the project at an appropriate level (Manufacturing and Construction) .
Man 3c	Responsible Construction Management	2	1	Main Contractor	The Main Contractor to register with CCS and achieve a score of beyond compliance or confirm compliance with the marked items of Table 4.1 in the BREEAM technical manual for one credit plus six additional items.
Man 3d	Monitoring of Construction site Impacts (Energy and Water)	1	1	Main Contractor	Main Contractor sets targets, monitors and reports on energy and water consumption each month, based on site activities.
Man 3e	Monitoring of Construction Site Impacts (Transport)	1	1	Main Contractor	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.
Man 4 - Commissioning and Handover					
Man 4a	Commissioning, Testing Schedule and Responsibilities	1	1	M&E	Prepare a schedule of commissioning and testing that identifies a suitable timescale for commissioning and re-commissioning of all building services and control systems, and for testing and inspecting building fabric. The schedule identifies the appropriate standards for all commissioning activities to be conducted in accordance with: - Current Building Regulations - BSRIA Guidelines



BREEAM 2018 New Construction Criteria (NC)

Page 7

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					- CIBSE Guidelines - Other appropriate standards Where a building management system is specified: - Carry out commissioning of air and water systems when all control devices are installed, wired and functional. - Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in commissioning results. - The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover. - All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover. - Fully train the occupier or facilities team in the operation of the system. - Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include re-commissioning activities on behalf of the client. - The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. Allow the required time to complete all commissioning and testing activities prior to handover.
Man 4b	Commissioning – Design and Preparation	1	1	M&E	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: - Undertaking design reviews and giving advice on suitability for ease of commissioning. - Providing commissioning management input to construction programming and during installation stages. - Management of commissioning, performance testing and handover or post-handover stages.



BREEAM 2018 New Construction Criteria (NC)
Page 8
Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 4c	Testing and Inspecting Building Fabric	1	1	Main Contractor	Complete post construction testing and inspection to quality-assure the integrity of the building fabric. A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard. Rectify any defects identified during post-construction testing and inspection prior to building handover.
Man 4d	Handover	1	1	Main Contractor	Prior to handover, develop two building user guides for the following users: - A non-technical user guide for distribution to the building occupiers - A technical user guide for the premises facilities managers A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users, Prepare two training schedules timed appropriately around handover and proposed occupation for the following users: - A non-technical training schedule for the building occupiers - A technical training schedule for the premises facilities managers
Health and Wellbeing					
Hea 1 - Visual Comfort					
Hea 1b	Daylighting	2	2	Daylight Consultant	Daylighting criteria have been met using either of the following options: a. The relevant building areas meet good practice daylight factors and other criteria as outlined in Table 5.1 of the NC 2018 Technical Manual. and Table 5.2 of NC 2018 Technical Manual OR b. The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table 5.3 of NC 2018 Technical Manual.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Hea 1c	View Out	1	1	Architect	95% of the floor area in 95% of spaces for each relevant building area provides an adequate view out.
Hea 1d	External Lighting	1	1	M&E	External Lighting – All external lighting located within the construction zone is specified in accordance with BS 5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting – Lighting of work places – Part 2: Outdoor work places. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. Where no external light fittings are specified (either separate from or mounted on the external building façade or roof), the criteria relating to external lighting do not apply and the credits can be awarded on the basis of compliance with criteria 7-8. If no internal lighting is specified the credit cannot be awarded.
Hea 4 – Thermal Comfort					
Hea 4a	Thermal Modelling	1	1	M&E / Energy Assessor	Thermal modelling has been carried out using software in accordance with CIBSEAM11(79) Building Energy and Performance Modelling. The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis The modelling demonstrates that: <u>For air-conditioned buildings,</u> summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design(80) , Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type); or the thermal environment in occupied spaces meet the Category B requirements for PPD, PMV and local discomfort set out in Table A.1 of Annex A of ISO7730:2005. <u>For naturally ventilated buildings:</u> Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5. Or other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type). The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in either of the following standards as



BREEAM 2018 New Construction Criteria (NC)

Page 10

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					appropriate; CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings (81) or CIBSE TM59: Design methodology for the assessment of overheating risk in homes (82). For air-conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.
Hea 4b	Design for Future Thermal Comfort	1	1	M&E / Energy Assessor	The thermal modelling demonstrates that the relevant requirements set out in criterion 3 on the previous page are achieved for a projected climate change environment. Where criterion 6 above is not met, the project team demonstrates how the building has been adapted or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under criterion 6 above. For air-conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.
Hea 5 - Acoustic Performance					
Hea 5a	Acoustic Performance	1	1	Acoustician	Shell Only Specific Criteria: Criteria - Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014 Testing requirement - A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology section of the BREEAM Technical Manual
Hea 6 - Safety and Security					
Hea 6	Security of Site and Building	1	1	Architect/ALO	A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The SQSS develops a set of recommendations or solutions during or prior to Concept Design (RIBA Stage 2 or equivalent). These recommendations or solutions aim to ensure that the design of buildings, public and private car parks and public or amenity space are planned, designed and specified to address the issues identified in the preceding SNA. The recommendations or solutions proposed by the SQSS are implemented. Any deviation from those recommendations or solutions will need to be justified, documented and agreed in advance with a suitably qualified security specialist.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Hea 7 – Safe and Healthy Surroundings					
Hea 7a	Safe Access	1	1	Architect/Landscape Architect	Where external site areas form part of the assessed development the following apply: 1. Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. 2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space d. Connecting to off-site paths where applicable 3. Pedestrian drop off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths. Where vehicle delivery access and drop off areas form part of the assessed development, the following apply; 4. Delivery areas are not accessed through general parking areas and do not cross or share the following: a. Pedestrian and cyclist paths b. Outside amenity areas accessible to building users and general public 5. There is dedicated parking or waiting area for goods vehicles with appropriate Separation from the manoeuvring area and staff and visitor car parking. 6. Parking and turning areas are designed for simple manoeuvring according to the type of vehicle likely to access the site, thus avoiding the need for repeated shunting.
Hea 7b	Outside Space	1	1	Architect/Landscape Architect	There is an outside space providing building users with an external amenity area.



BREEAM 2018 New Construction Criteria (NC)

Page 12

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Energy					
Ene 1 - Reduction of CO2 Emissions					
Ene 1	Reduction of CO ₂ Emissions	9	4	Energy Assessor	4no. assumed credits – And EPR_{NC} of 0.4 a performance improvement better than the relevant national building regulations compliant standard.
Ene 2 – Energy Monitoring					
Ene 2a	Sub-metering of end-use categories	1	1	M&E	Install energy metering systems so that at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories. Meter the energy consumption in buildings according to the total useful floor area: If the area is greater than 1,000m², by end-use category with an appropriate energy monitoring and management system. If the area is less than 1,000m², use either: an energy monitoring and management system or separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system. Building users can identify the energy consuming end uses, for example through labelling or data outputs.
Ene 2b	Sub-metering of high energy load and tenancy areas	1	1	M&E	Monitor a significant majority of the energy supply with: An accessible energy monitoring and management system for tenanted areas or relevant function areas or departments in single occupancy buildings. OR Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					system for tenanted areas or relevant function areas or departments in single occupancy buildings. Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogeneous function, for example hotel bedrooms, offices.
Ene 3 - External Lighting					
Ene 3	External Lighting	1	1	M&E	The average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 luminaire lumens per circuit Watt. All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.
Ene 4 - Low Carbon Design					
Ene 4a	Passive Design Analysis	1	1	M&E / Energy Assessor	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. The project team analyses the proposed building design and development during Concept Design 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. Quantify the reduced total energy demand and carbon dioxide (CO₂-eq) emissions resulting from the passive design measures.
Ene 4b	Free Cooling	1	0	M&E / Energy Assessor	Credit Not Sought Achieve the passive design analysis credit. Include a free-cooling analysis in the passive design analysis carried out under criterion 2. Identify opportunities for the implementation of free cooling solutions. The building is naturally ventilated or uses any combination of the free cooling strategies listed in the Free Cooling analysis.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Ene 4c	LZC Technologies	1	1	M&E / Energy Assessor	An energy specialist (see Definitions on page 157) completes a feasibility study (see Low and zero carbon feasibility study on the next page) by the end of Concept Design . Establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy sources for the building or development based on the feasibility study. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. Quantify the reduced regulated carbon dioxide (CO ₂ -eq) emissions resulting from the feasibility study.
Ene 6 - Energy Efficient Transportation Systems					
Ene 6a	Energy Consumption	1	1	Lift Supplier	For specified lifts, escalators or moving walks (transportation types): 1a. Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators or moving walks. 1b. Calculate the energy consumption in accordance with BS EN ISO 25745 Part 2 or Part 3 for one of the following: 1bi. At least two options for each transportation type (e.g. for lifts, hydraulic, traction or machine room-less (MRL) OR 1bii. At least two options considering different system arrangements and control Strategies. 1c. Consider the use of regenerative drives, subject to the requirements in Regenerative drives contained in the BREEAM Technical Manual. 1d. Specify the transportation system with the lowest energy consumption.
Ene 6b	Energy Efficient Features – Lifts	1	1	Lift Supplier	Achieve Criterion 1 above. Specify the following three energy efficient features for each lift: a. A standby condition for off-peak periods. b. The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of >70 luminaire lumens per circuit Watt. c. Use of drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. Specify regenerative drives where their use is demonstrated to save energy.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue	Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Transport				
Tra 1 - Transport assessment and travel plan				
Tra 1	Transport Assessment and Travel plan	2	2	BREEAM Assessor
No later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form; The site-specific travel assessment (or statement) shall cover as a minimum: a: If relevant, travel patterns and attitudes of existing building or site users towards cycling, walking and public transport, to identify relevant constraints and opportunities. b: Predicted travel patterns and transport impact of future building or site users. c: Current local environment for pedestrians and cyclists, accounting for any age-related requirements of occupants and visitors. d: Reporting of the number and type of existing accessible amenities, within 500m of the site. e: Disabled access accounting for varying levels and types of disability, including visual impairment. f: Calculation of the existing public transport Accessibility Index (AI), g: Current facilities for cyclists. Following a transport assessment, a site-specific travel plan that provides a long-term management strategy which encourages more sustainable travel will be produced. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation. If the occupier is known, involve them in the development of the travel plan. Demonstrate that the travel plan will be implemented and supported by the building's management in operation.				
Tra 2 – Sustainable Transport Measures				
Tra 2 (p)	Pre-Requisite	Pre-Req	Pre-Req	BREEAM Assessor
Achieve criteria 3-5 in the Tra 01 Transport Assessment and travel plan.				
Tra 2	Transport Options Implementation	10	5	BREEAM Assessor
BREEAM Assessor Notes Sustainable transport measures are incorporated into the development as follows: - Install compliant cycle storage spaces to meet the minimum levels set out in Table 7.5. 4 total spaces Spaces are publicly accessible within proximity of a main building entrance. Compliant cyclists facilities are needed for staff only and covered overhead - AI over 8				



BREEAM 2018 New Construction Criteria (NC)

Page 16

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					- At least three existing amenities are present, see Table 7.6 - Enhanced amenities in the form of an appropriate food outlet or leisure facility
Water					
Wat 1 - Water Consumption					
Wat 1	Water Consumption	5	3	Architect	3no. credits targeted which requires a 40% improvement over the BRE's baseline performance. Flow rate examples can be provided to meet this requirement. An assessment of the efficiency of newly specified domestic water-consuming components. The efficiency of the following 'domestic scale' water-consuming components must be included in the assessment: - WCs - Urinals - Taps (wash hand basins and where specified kitchen taps and waste disposal unit) - Showers - Baths - Dishwashers (domestic and commercial sized) and - Washing machine (domestic and commercial or industrial sized)
Wat 2 - Water Monitoring					
Wat 2	Water Monitoring MINIMUM STANDARD	1	1	M&E	The specification of a water meter on the mains water supply to the building Each meter (main and sub) has a pulsed or other open protocol communication output to enable connection to an appropriate utility monitoring and management system. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Wat 3 - Water Leak Detection and Prevention					
Wat 3a	Leak Detection System	1	1	M&E	A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be: a. A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks is installed. b. Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. d. Programmable to suit the owner/occupiers' water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.
Wat 3b	Leak Prevention	1	1	M&E	Install flow control devices that regulate the water supply to each WC area or sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework
Wat 4 - Water Efficient Equipment					
Wat 4	Water Efficient Equipment	1	1	Landscape Architect	Identify all water demands from uses other than those listed under Calculation of Water Efficiency Performance that could be realistically mitigated or reduced. Where there is no water demand from uses other than domestic scale, sanitary use components in the building, this issue is not applicable. Identify systems or processes to reduce the relevant water demand and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue	Available Credits	Targeted Credits	Responsibility	BREEAM Criteria	
Materials					
Mat 1 Environmental impacts from construction products - Building life cycle assessment (LCA)					
Mat 1	Environmental Impacts from Construction products - Building Life Cycle Assessment (LCA)	7	0	Architect/Structural Engineer	Credit Not Sought Creation of Life Cycle Assessments during Concept Design , and integrating its outcomes in the design decision-making process.
Mat 2 - Environmental impacts from construction products – Environmental Product Declarations (EPD)					
Mat 2	Environmental Impacts from Construction Products – (EPD)	1	1	Architect/Structural Engineer	Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the Methodology below.
Mat 3 - Responsible Sourcing of Materials					
Mat 3a	Timber Procurement MINIMUM STANDARD	Pre-Req.	Pre-req.	Main Contractor	All timber used on site will be sourced in accordance with the UK Government's Timber Procurement Policy.
Mat 3b	Enabling Sustainable Procurement	1	1	Main Contractor	During the Preparation and Briefing stage, the principal contractor sources materials for the project in accordance with a documented sustainable procurement plan
Mat 3c	Measuring Responsible Sourcing	3	1	Main Contractor	Key building materials are responsibly sourced to reduce environmental and socio-economic impacts.
Mat 5 - Designing for Robustness					
Mat 5	Designing for Robustness	1	1	Architect	Protecting vulnerable parts of the building from damage 1. The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external



BREEAM 2018 New Construction Criteria (NC)

Page 19

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					building and landscaping elements. This must include, but is not necessarily limited to: a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. Protecting exposed parts of the building from material degradation Environmental factors have been identified that are relevant to the site location. Existing applicable building elements that are exposed to any relevant environmental factors have been identified. 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 to be 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. Newly specified materials or newly constructed elements (e.g. a new external wall) within the scope of works incorporate appropriate design and specification measures to limit material degradation due to environmental factors.
Mat 6 – Material Efficiency					
Mat 6	Material Efficiency	1	0	Design Team / Architect	Credit Not Sought At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages. Preparation and Brief Concept Design Developed Design Technical Design Construction. Develop and record the implementation of material efficiency, during: Developed Design Technical Design



BREEAM 2018 New Construction Criteria (NC)

Page 20

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					Construction. Report the targets and actual material efficiencies achieved.
Waste					
Wst 1 - Construction Waste Management					
Wst 1a	Pre-Demolition Audit	-	-	Developer	Understood Demolition is not applicable During Concept Design , complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition.
Wst 1b	Construction Resource Efficiency	3	2	Main Contractor	Produce a Resource Management Plan (RMP) covering non-hazardous waste materials, including demolition and excavation waste. Record data on waste arisings and waste management routes. The waste generated per 100m ² (GIFA) is: ≤ 7.5 m³ (actual, not bulk volume) ≤ 6.5 tonnes
Wst 1c	Diversion of Waste from Landfill	1	1	Main Contractor	Targets and procedures will be put in place to ensure that over 70% by volume / 80% by weight of construction waste generated is diverted from landfill and that materials will be sorted into key waste groups.
Wst 2 -Recycled Aggregates					
Wst 2a	Pre-Requisite	Pre-req	Pre-req	Main Contractor	Credit Not Sought If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Criterion 1 and 2 of Wst 01.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Wst 2b	Project Sustainable Aggregates	1	0	Main Contractor	Credit Not Sought - Identify all aggregate uses and types on the project - Determine the quantity in tonnes for each identified use and aggregate type. - Identify the region in which the aggregate source is located. - Calculate the distance in kilometres travelled by all aggregates by transport type Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points.
Wst 3 - Operational Waste					
Wst 3	Operational Waste	1	1	Architect/ building Owner	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: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors 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. Where food waste is to be generated a water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.
Wst 5 – Adaptability to Climate Change					
Wst 5a	Resilience of Structure, Fabric, Building Services and Renewables Installation	1	1	Architect / Structural Engineer	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: 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: • Hazard identification • Hazard assessment • Risk estimation • iv. Risk evaluation



BREEAM 2018 New Construction Criteria (NC)

Page 22

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					Risk management.
Wst 5 Ex	Responding to Climate Change	1	0	Architect / Structural Engineer	Credit Not Sought All of the following credits are achieved: - Hea 04 Thermal comfort - Criterion 6 - Ene 01 Reduction of energy use and carbon emissions - A minimum of six credits - Ene 04 Low carbon design - The passive design analysis credit - Wat 01 Water consumption - A minimum of three credits - Mat 05 Designing for durability and resilience - Criteria 2–4 Pol 03 Flood and surface water management - Flood resilience: a minimum of one credit Surface water run-off: two credits
Wst 6 – Design for disassembly and adaptability					
Wst 6	Functional Adaptability	2	2	Architect / Structural Engineer	A building-specific functional adaptation strategy study to be undertaken by the client. Functional adaptation measures have been adopted in the design by Technical Design stage (RIBA Stage 4 or equivalent) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor
Land Use and Ecology					
Le 1 – Site Selection					
Le 1a	Site Selection	1	1	Architect	At least 75% of the proposed development is on previously developed land.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Le1b	Contaminated Land	1	0	Contaminated Land Specialist	Credit Not Sought BREEAM Assessor Notes – If land is deemed to be contaminated credit is applicable – Design Team to advise A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified: - The degree of contamination - The contaminant sources or types - The options for remediating sources of contamination which present an unacceptable risk. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional.
Le 2 - Identifying and understanding the risks and opportunities for the project					
Le 2	Ecological Risks and Opportunities for the Project	2	2	Ecologist / Design Team	During Concept Design , Identify and understand the ecological risks and opportunities associated with the site to inform the determination of the strategic outcome for the site.
Le 3 - Managing negative impacts on ecology					
Le 3	Managing Negative Impacts on Ecology	3	2	Ecologist / Design Team / Contractor	Recognition of steps taken to avoid impacts on existing site ecology as far as possible.
Le 4 - Change and enhancement of ecological value					
Le 4	Change and Enhancement of Ecological Value	4	2	Ecologist / Design Team / Main Contractor	Recognition of steps taken to avoid impacts on existing site ecology as far as possible.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
LE 5 - Long term ecology management and maintenance					
Le 5	Long Term Ecology Management and Maintenance	2	2	Ecologist/ Main Contractor	Encouraging the long-term maintenance and management of ecology on site to ensure both new and existing ecological features continue to thrive.
Pollution					
Pol 1 – Impact of Refrigerants					
Pol 1a	Impact of Refrigerants	3	1	M&E	All systems with electric compressors comply with the requirements of BS EN 378:2016 (parts 2 and 3). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice. 3 Credits – No refrigerant use within the installed plant or systems 2 Credits - Systems using refrigerants have a DELC of $\leq 100\text{kg CO}_2\text{eq/kW}$ cooling and heating capacity OR have a GWP < 10. 1 Credit - Systems using refrigerants have a DELC of $\leq 1000\text{kg CO}_2\text{eq/kW}$ cooling and heating capacity
Pol 1b	Leak Detection	1	1	M&E	All systems are hermetically sealed or only use environmentally benign refrigerants. OR Where the systems are not hermetically sealed systems have a permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks, or an inbuilt automated diagnostic procedure for detecting leakage is enabled. In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant.
Pol 2 – Local Air Quality					
Pol 2	Local Air Quality	2	2	M&E	2 Credits - All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity, OR NOx emissions from gas fuelled boilers do not exceed 24 mg/kWh.



BREEAM 2018 New Construction Criteria (NC)

Page 25

Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					1 Credit - NOx emissions from gas fuelled boilers do not exceed 27 mg/kWh.
Pol 3 Surface Water Run-Off					
Pol 3a	Flood Risk	2	2	Flood Risk Specialist	Flood Risk Zone 1 – A flood risk assessment been completed during Concept Design for the development.
Pol 3b	Surface Water Run-off (Rate)	1	1	Drainage Consultant	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 pre-development site. This should comply at the 1-year and 100-year return period events. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place. Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance.
Pol 3c	Surface Water Run-off (Volume)	1	1	Drainage Consultant	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. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques. Where the man-made impermeable area draining to the watercourse (natural or municipal) has decreased or remains unchanged post-development, the volume of run-off requirements (criteria 11-16) can be considered as met. Volume calculations will not be provided. Instead, drawings clearly showing the impermeable areas of the site draining to the watercourse should be provided for the pre and post development scenarios. Figures must also be given (ideally on the drawings) to show a comparison between the areas of drained impermeable surfaces pre and post development.



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Pol 3d	Minimising Watercourse Pollution	1	1	Drainage Consultant	There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant). Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. 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. 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. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual 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. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.
Pol 4 – Reduction of Night-time Light Pollution					
Pol 4	Reduction of Night-time Light Pollution	1	1	M&E	The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. Where specified, illuminated advertisements are designed in compliance with ILP PLG05



Project: Crown Street Tower D (Office)

Project No: 2022.176

Revision: 1.0

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
					The Brightness of Illuminated Advertisements.
Pol 5 – Reduction of Noise Pollution					
Pol 5	Reduction of Noise Pollution	1	1	Acoustician	There are no noise-sensitive areas within the assessed building or within 800 m radius of the assessed site. OR Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS4142:2014(231) is commissioned. Noise levels must be measured or determined for: - Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed assessed site including existing plant on a building, where the assessed development is an extension to the building. - Noise rating level from the assessed building. The noise impact assessment must be carried out by a suitably qualified acoustic consultant. The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise sensitive development, must be at least 5dB lower than the background noise throughout the day and night. If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion.

