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Airport City Limited Partnership

Plot H5 Premier Inn

240190

Sustainability Statement

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Sustainability at our core.

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Sustainability Strategy for Planning

1.0 Executive Summary

This sustainability statement has been produced by CPW in support of the planning application for the proposed development of Plot H5 Premier Inn as part of the wider Manchester Airport City development.

The planned new development comprises a of nine story hotel, with restaurant, front of house and back of house amenity spaces to the ground floor and 7no. floors of bedrooms with ensuites, and linen rooms.

This report sets out an overview of the sustainability and energy considerations of the proposed development in order to demonstrate that sustainable design has been a key consideration and aspiration of the project and to show conformity with the planning policy requirements.

1.1 Sustainability Strategy

The development has incorporated the following into its sustainability strategy:

- BREEAM V6 Assessment targeting Excellent
- EPC A
- Reduce water demands through targeting a reduction in water consumption of 25% below a typical baseline for this building type.
- Reduce embodied carbon through considerate material selection and LCA analysis.
- Reduce waste through material efficiency and adaptability embedded into the design

Sustainability Strategy for Planning

2.0 Introduction

2.1 Development Description

The planned new development comprises a of nine story hotel of 257 bedrooms, with restaurant, front of house and back of house amenity spaces to the ground floor and 7no. floors of bedrooms with ensuites, and linen rooms.

The building is part of the Mix Manchester project part of the wider Manchester Airport City, located to the south of Manchester Airport Terminal 1 with the M56 motorway located to the north and Manchester Airport train station to the south. The site is surrounded by other hotel developments and hard standing with a small amount of soft landscaping as part of the hotel development.

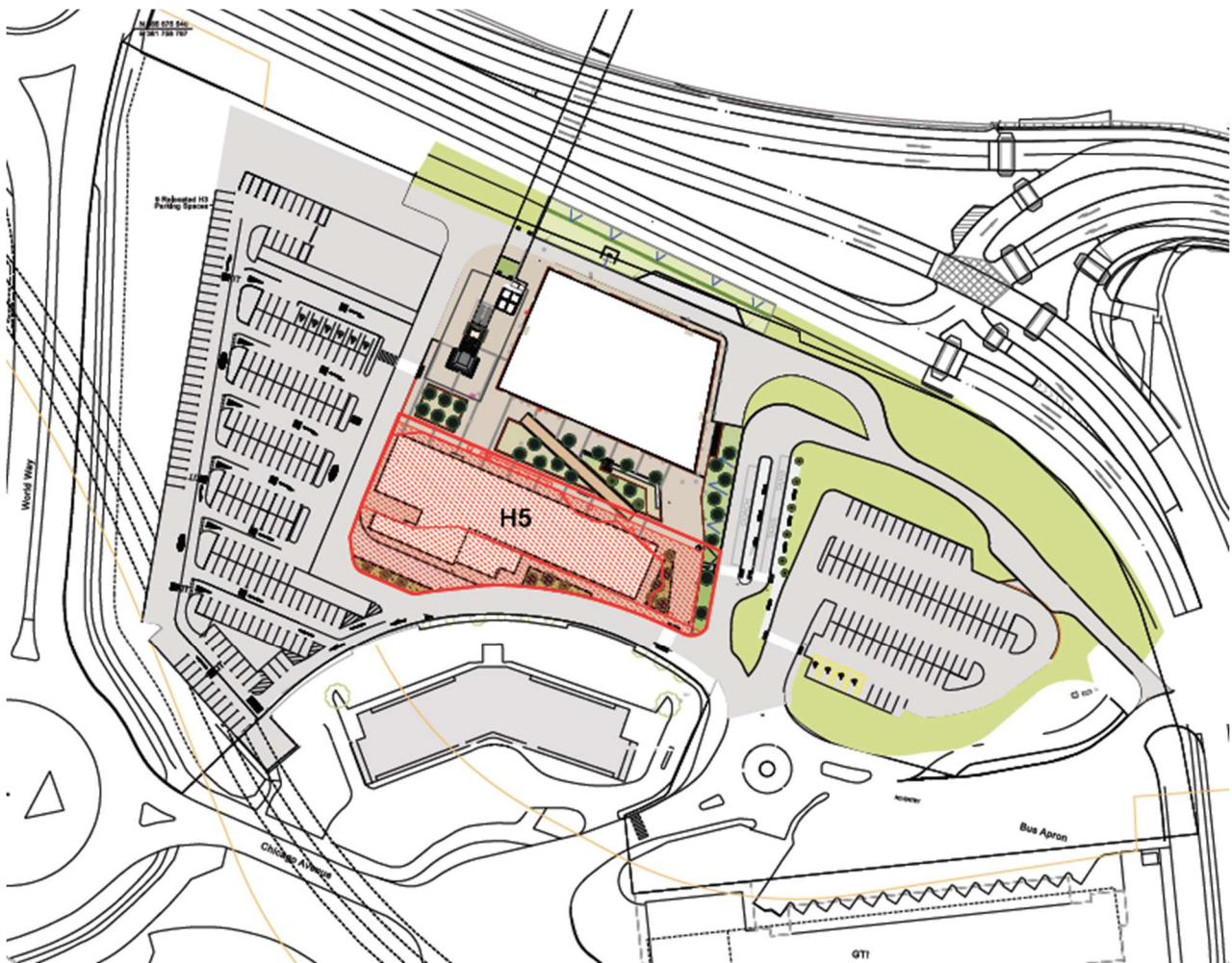


Figure 1 Plot H5 Site Location

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3.0 Energy

3.1 Energy Benchmarking – Estimated Energy Demands and CO2 Emissions

In order to benchmark the proposed new development, estimated energy demands and CO2 emissions data have been calculated. These estimated energy consumptions are indicative only at this stage. They will, however, be used as a guideline to assess the percentage of the building's total energy consumption and CO2 emissions that could be reduced or offset by applying suitable renewable and/or low carbon technology energy options.

For the purposes of BREEAM, it is prudent for this report to reflect the benchmark data derived from approved Dynamic Simulation Model (DSM) software which uses government and industry agreed National Calculation Methodology (NCM) room templates containing standard operating conditions. This is due to the fact that BRE Global will only accept results from the approved models when verifying the percentage reduction in CO2 emissions from the building for credits Ene 1 and Ene 4 (BREEAM V6).

The estimated energy consumption and CO2 emissions for the development, including passive low energy features but no renewable or LZC technologies, derived from approved DSM software (IES), are shown below:

The total predicted building energy consumption is: **811,391kWhr per year**

The total predicted building CO2 emissions are: **113,720kgCO2 per year**

3.2 Appraisal of Renewable and Low Carbon Technology Energy Options – Be Green

The technical feasibility of installing each LZC technology at the Plot H5 Premier Inn has been assessed in order to discount any unsuitable options at an early stage. A summary of the feasibility process is tabulated below.

Table 1 LZC Considerations for Plot H5 Premier Inn

Technology	Brief Description	Benefits	Issues/Limitations	Feasible for site
Solar Photovoltaic	Solar photovoltaic panels convert solar radiation into electrical energy through semiconductor cells. They are not to be confused with solar panels which use the sun's energy to heat water (or air) for water and space heating.	Low maintenance/no moving parts Easily integrated into building design	Any overshadowing reduces panel performance Panels ideally inclined at 30° to the horizontal facing a southerly direction	Yes
Solar Thermal	Solar thermal energy can be used to contribute towards space heating and hot water requirements. The two commonest forms of collector are panel and evacuated tube.	Low maintenance Little/no ongoing costs	Must be sized for the building hot water requirements Panels ideally inclined at 30° to the horizontal facing a southerly direction	No, limited roof space so solar PV has been prioritised.
Ground Source Heat Pump (GSHP)	GSHP systems tap into the earth's considerable energy store to provide both heating and cooling to buildings. A number of installation methods are possible including horizontal trench, vertical boreholes, piled foundations (energy	Minimal maintenance Unobtrusive technology Flexible installation options to meet available site footprint	Large area required for horizontal pipes Full ground survey required to determine geology	No, prohibitively expensive installation costs

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Technology	Brief Description	Benefits	Issues/Limitations	Feasible for site
	piles) or plates/pipe work submerged in a large body of water. The design, installation and operation of GSHPs is well established.		More beneficial to the development if cooling is required Integration with piled foundations must be done at an early stage	
Air Source Heat Pump	Electric or gas driven air source heat pumps extract thermal energy from the surrounding air and transfer it to the working fluid (air or water).	Efficient use of fuel Relatively low capital costs	Specialist maintenance More beneficial to the development if cooling is required Requires defrost cycle in extreme conditions Some additional plant space required	Yes, part of base build specification.
Wind Turbine (Stand-alone column mounted)	Wind generation equipment operates on the basis of wind turning a propeller, which is used to drive an alternator to generate electricity. Small scale (1kW – 15kW) wind turbines can be pole or roof mounted.	Low maintenance/ongoing costs Minimum wind speed available Excess electricity can be exported to the grid	Planning issues Aesthetic impact and background noise Space limitations on site Wind survey to be undertaken to verify 'local' viability	No, not suitable on this site
Wind Turbine (Roof Mounted)	As above	Low maintenance/ongoing costs Minimum wind speed available Excess electricity can be exported to the grid	Planning issues Aesthetic impact and background noise Structural/vibration impact on building to be assessed Proximity of other buildings raises issues with downstream turbulence Wind survey to be undertaken to verify 'local' viability	No, not suitable on this site

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Technology	Brief Description	Benefits	Issues/Limitations	Feasible for site
Gas Fired Combined Heat and Power	A Combined Heat and Power (CHP) installation is effectively a mini on-site power plant providing both electrical power and useful heat. CHP is strictly an energy efficiency measure rather than a renewable energy technology.	Potential high CO₂ saving available Efficient use of fuel Excess electricity can be exported to the grid Benefits from being part of an energy centre/district heating scheme	Maintenance intensive Sufficient base thermal and electrical demand required Some additional plant space required	No, avoided due to carbon considerations opting for an all electric building.
Bio-fuel Fired Combined Heat and Power	As above.	Potential high CO₂ saving available Efficient use of fuel Excess electricity can be exported back to the grid Benefits from being part of an energy centre/district heating scheme	Maintenance intensive Sufficient base thermal and electrical demand required Significant plant space required Biomass fuelled systems are at early stages of commercialisation Large area needed for fuel delivery and storage Reliable biomass fuel supply chain required	No, not suitable on this site
Bio-Renewable Energy Sources (Automated feed – wood-fuel boiler plant)	Modern wood-fuel boilers are highly efficient, clean and almost carbon neutral (the tree growing process effectively absorbs the CO ₂ that is emitted during combustion). Automated systems require mechanical fuel handling and a large storage silo.	Stable long term running costs Potential good CO₂ saving	Large area needed for fuel delivery and storage Reliable fuel supply chain required Regular maintenance required Significant plant space required	No, not suitable on this site
Fuel Cells and Fuel Cell Combined Heat and Power	Fuel cells convert the energy of a controlled chemical reaction, typically involving hydrogen and oxygen, into electricity, heat and water vapour. Fuel cell stacks operate in the temperature	Zero CO₂ emissions if fired on pure hydrogen and low CO₂ emissions if fired on other hydrocarbon fuels	Expensive Pure hydrogen fuel supply and distribution infrastructure limited in the UK	No, expensive, emerging technology

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Technology	Brief Description	Benefits	Issues/Limitations	Feasible for site
	range 65°C – 800°C providing co-generation opportunities in the form of Combined Heat and Power (CHP) solutions.	Virtually silent operation since no moving parts High electrical efficiency Excess electricity can be exported back to the grid Benefits from being part of an energy centre/district heating scheme	Sufficient base thermal and electrical demand required Some additional plant space required Reforming process, used to extract hydrogen from alternative fuels, requires energy; lowering overall system efficiency	

3.3 Energy Strategy Summary

The general construction design standards to be adopted must exceed the requirements of the current (2021 Edition) Part L Building Regulations which stipulate an improvement on the CO₂ emissions of an aggregated 27% (for buildings other than dwellings) against 2013 standards.

To this end, the proposed design shall promote reduced CO₂ emissions from delivered energy consumption by minimising operational energy demand through passive and best-practice measures. The LZC technology energy options presented herein will potentially provide a further CO₂ reduction over and above the measures included as an integral part of the project design.

To conclude, having taken into account the impact of each solution; its cost, complexity, benefits and drawbacks, the following LZC technologies are recommended for inclusion on the Plot H5 Premier Inn development in order to meet the requirements of BREEAM in reducing CO₂ emissions (CO₂ saving data derived from IES model):

- **375m² of roof mounted Solar Photovoltaic panels (c. 9.5% CO₂ reduction)**
- **Air Source Heat Pump installation for office heating – part of the base build solution**

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4.0 Climate Resilience

4.1 Water Efficiency

Water use within the building will be minimised through careful selection of sanitaryware selection. This is likely to incorporate the specification of low volume flush WCs, low flow urinals, and flow restricted showers and taps. Externally there will be no vehicle wash down areas, and a high percentage of the tree and shrub material specified will be species indigenous to the local area, therefore requiring no automatic irrigation, relying on precipitation and the occasional watering by hand.

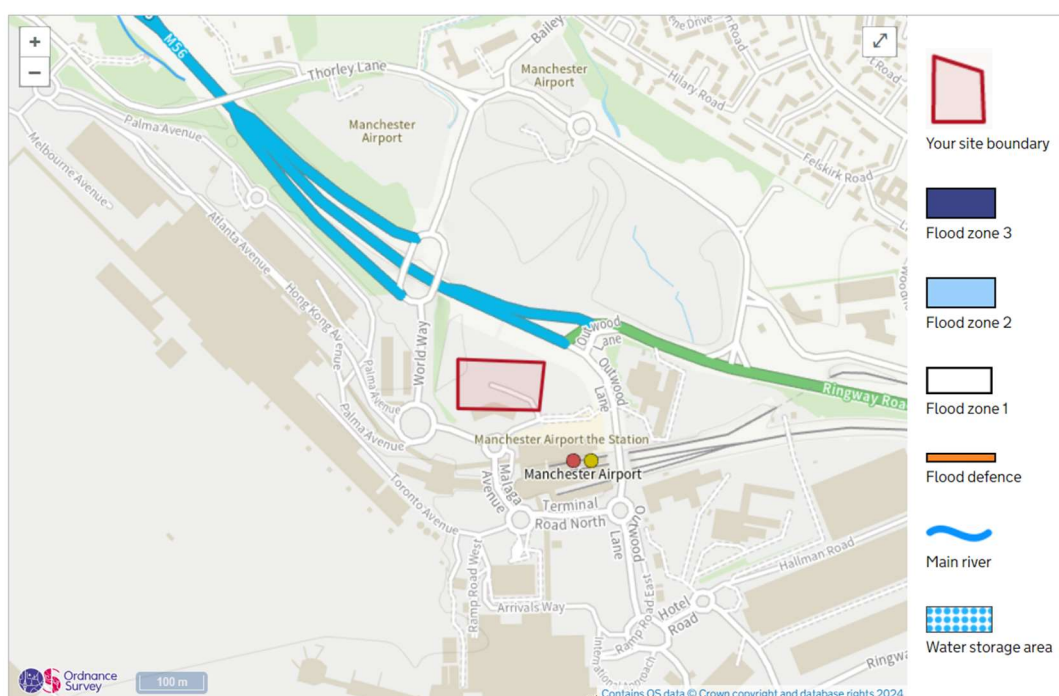
As a result, the development is targeting a reduction in water consumption of 25% below a typical baseline for this building type.

Water-use management is a detailed design issue however it can be considered at this stage for effective water-use management to ensure inclusion in design specifications at later stages. It also forms part of the BREEAM assessment. Potential water-use management approaches are as follows:

- **Water meters:** Water meters will be provided on all supplies to the retail units. The office and landlord supplies will be sub-metered allowing the monitoring of mains water use.
- **Leak detection and prevention:** Water leak detection equipment will be fitted to the incoming supply capable of detecting any major leaks between the utility supply and building and within the building. Flow control devices will also be installed on the water supplies to all WC areas within the landlord's demise.

4.2 Flood Risk

The site is located in in flood zone 1 meaning it has a low probability of flooding.



4.3 Passive Design Measures

Passive design features of the Plot H5 development mean that the building is well adapted to these risks. Firstly, the energy demand has been reduced, resulting in the building being less affected by the decreased availability of energy. Secondly, the development will have a lower carbon footprint, helping prevent further contributions to climate change.

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A combination of the expected increase in external temperatures and the extensive glazing to the office areas could potentially put the building at risk of overheating. However, a number of features have been included within the building design to prevent this.

Efficient lighting and mechanical systems will keep the Plot H5 development internal heat gains to a minimum. High performing U-values and designing out thermal bridges will retain heat within the building. This also means that heat cannot enter the building through the fabric. High thermal mass will absorb much of the heat that is present within rooms, keeping the room below external temperatures.

These features, in addition to the incorporation of some natural ventilation, will mean that there will be lower demand for cooling, keeping the building's energy demand low.

This combination of passive design measures will act to stabilise the temperatures within the building and enable it to adapt to any temperature extremes.

4.3.1 Building Fabric Thermal Performance

The following table describes the proposed minimum building envelope thermal performance criteria.

Table 2 Building Fabric Thermal Performance and Targets

Element	Part L 2021 Building Regulations (Notional)	Target Criteria Value	Notes
Roof 'U' Value	0.18W/m ² K (flat roof)	0.15W/m ² K	No pitched roofs in the building
External Wall 'U' Value	0.26W/m ² K	0.15W/m ² K	
Ground Floor 'U' Value	0.18W/m ² K	0.15W/m ² K	Applicable to both ground bearing and supported slab
External Glazing 'U' Value	1.6W/m ² K	0.92W/m ² K	
External Glazing 'G' Value		0.42	Solar gain transmission value
External Glazing 'Lt' Value		0.38	Light transmission value
Air-permeability	8m ³ /hour/m ² @ 50Pa	5m ³ /hour/m ² @ 50Pa	

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Thermal Bridging (ψ) Value (W/mK)		Consider and limit where possible	
Mechanical Ventilation Heat Recovery Device Efficiency		75%	Current specification operate at a heat recovery efficiency of circa 83%.

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5.0 Materials and Waste

5.1 Material Specification

As part of the BREEAM assessments and in the interest of the BREEAM Mat01 LCA carried out, the proposed materials palette will have regard for using new construction materials and components that have a low environmental impact, for instance, as rated by The Green Guide to Specification and the responsible sourcing of products.

The material specification and products proposed for the Development have been chosen to meet the principles of sustainable material use as outlined in planning policy and where possible will have the following characteristics:

- Low embodied carbon.
- High recycled content.
- Responsibly sourced and accredited to a recognised standard such as Forestry Stewardship Council (FSC), Environmental Management System (EMS), and BES 6001 certification.
- Refrigerants and insulations to have a low or zero Global Warming Potential (GWP).
- External materials to have low albedo and high conductivity.
- To have low or zero Volatile Organic Compounds (VOCs).

5.2 Circular Economy

5.2.1 Durability and Resilience

Under BREEAM V6, the Mat 05 durability and resilience credit is being targeted and the following examples highlight how the durability of the proposed construction materials will limit the need for repair and help avoid premature replacement as far as practicable:

- The building envelope material and fixings specifications will be suitably robust to withstand degradation and structural damage caused by excessive weathering and possible high winds.
- To avoid UV damage and subsequent need for replacement, UV resistant weatherproof membrane will be specified for the roof.
- Façade materials are metal cladding and glass which comparatively (to materials such as timber) would not be significantly affected by either increase in dust or by more frequent cleaning regimes. Timber is to be avoided for this reason. Suitable maintenance regime and access will be put in place to avoid premature end-of-life for façade materials.

5.2.2 Material Efficiency

In line with the BREEAM credit Mat 06 Material Efficiency, at the end of each RIBA stage the project team will examine opportunities to implement appropriate measures to ensure that the amount of materials used in the construction of the proposed development are optimised, and therefore reduce the amount of construction waste arising from site. Thus far, the following measures have been discussed to help optimise material use on the Development:

- The use of prefabricated elements will be encouraged, this is likely to include bathrooms pods, and can also be considered for the façade and cladding. This is to reduce the potential for site waste.
- Cement replacement could be incorporated into structural concrete, this is subject to procurement and can be investigated as the project develops.
- The façade has been designed to minimise the number of window and cladding panel types, to improve manufacturing efficiency.

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5.2.3 Design for Adaptability and Disassembly

A Functional Adaptability study has been undertaken for the buildings to identify opportunities for accommodating future changes of use to the buildings over their lifespan, and how they could be incorporated into the design proposals. The study has been prepared to comply with BREEAM credit issue Wst06

5.3 Waste Management

5.3.1 Construction Waste

The Main Contractor will be expected to minimise the amount of waste they generate, for example through take-back schemes with suppliers and/or just-in-time deliveries. They will be required to reuse or recycle the majority of their waste, limiting the amount sent to landfill as far as possible.

On appointment, the Main Contractor will be required to provide a copy of their site waste management plan prior to start on site.

5.3.2 Operational Waste

A dedicated waste store will be provided for the building, with separate bins for recycling and general waste. This is located where there is room for waste collection vehicles to empty them on site, so as not to interrupt the flow of traffic on local roads.

Internally, recycling bins will be located at frequent points throughout the building. These will be emptied into the external store on a regular basis, so as to ensure they do not get filled up such that building personnel use the general waste instead.

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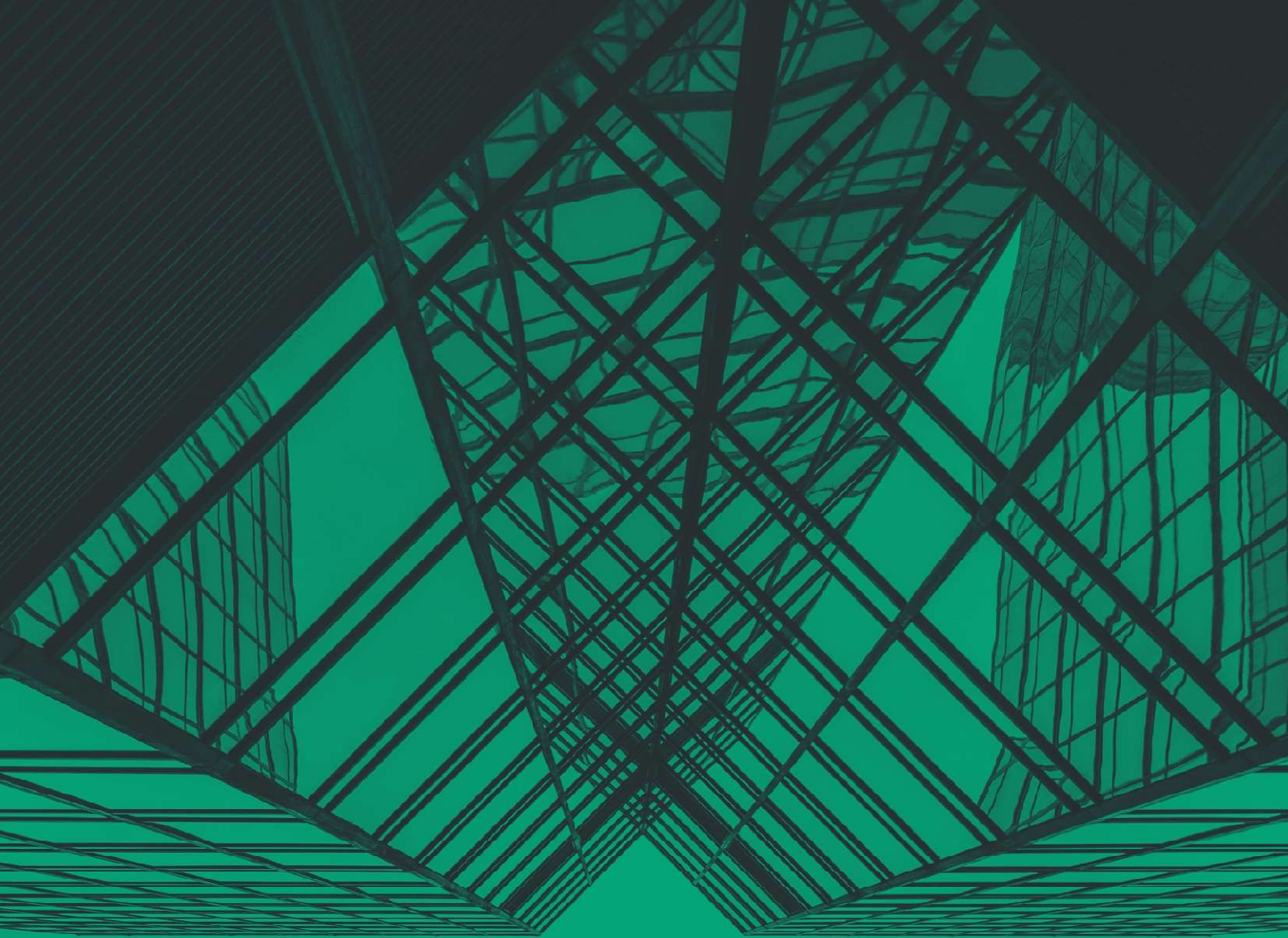
6.0 Environmental Rating Methods

6.1 BREEAM

Couch Perry and Wilkes LLP (CPW) has undertaken a BREEAM (Building Research Establishment's Environmental Assessment Method) pre-assessment of the Plot H5 Premier Inn. The building currently targets a score of 73.9% which translates into a BREEAM rating of EXCELLENT. The object of the assessment was to establish a base score for the scheme against the current design.

BREEAM Excellent represents performance equivalent to the top 10% of UK new non-domestic buildings

A full BREEAM Pre-Assessment report has been produced which details the aspirational performance of Plot H5 Premier Inn against the BREEAM V6 New Construction Residential Institution (Short Term Stay) Design Stage criteria.



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