

Upper Brook Street Masterplan Williams / Alliance UBS Limited

Environmental Standards Statement



**UPPER BROOK STREET MASTERPLAN - NORTH
MANCHESTER
MODA
PROPERTY ALLIAN**

Prepared for

**MODA
PROPERTY ALLIANCE GROUP**

Prepared by

Ridge and Partners LLP
5th Floor, Belvedere House
12 Booth Street
Manchester
M2 4AW
Tel: 0161 833 9579

Contact

Cain McGilloway
Building Services Engineer
cainmcgilloway@ridge.co.uk
07810031326

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

VERSION CONTROL

VERSION	DATE	DESCRIPTION	CREATED BY	REVIEWED BY
1.0	12.05.2023	Draft	CMcG	CB
2.0	19.05.2023	Updated with Comments`	CMcG	PD
3.0	23.05.2023	Updated to suit planning consultant comments	CMcG	PD
4.0	25.05.2023	Planning Issue	CMcG	-
5.0	26.05.2023	Draft 2 nd Issue	CMcG	CB
6.0	06.06.2023	Draft 2 nd Issue	AI	CB
7.0	0.9.06.2023	Draft update with comments	CMcG	PD
8.0	12.06.2023	Draft update with comments	CMcG	PD
9.0	16.06.2023	Draft updated to information on Crib Sheet	CMcG	CB
10.0	19.06.2023	Updated with Architect Comments incorporated	CMcG	CB
11.0	23.06.2023	First Issue	CMcG	PD
12.0	31.10.2023	Planning Issue	CMcG	PD

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

CONTENTS

1. EXECUTATIVE SUMMARY	5
1.1. Overview	5
1.2. Design Strategy	5
1.3. Results and Conclusion	5
2. INTRODUCTION	7
2.1. Applicant details	8
3. DEVELOPMENT PROPOSALS	9
3.1. Site Overview and Location	9
3.2. Development Proposals	11
4. ENERGY HIERARCHY	14
4.1. Decarbonisation of the Electricity Grid	14
5. GOVERNMENT REVIEW POLICY	16
5.1. National Policy Framework	16
5.2. The Greater Manchester Combined Authority (GMCA)	17
5.3. Manchester Core Strategy	17
5.4. The Emerging Places for Everyone Joint Development Plan	21
6. REGULATORY FRAMEWORK	24
6.1. Building Regulations	24
6.2. BREEAM	25
7. APPRAISAL OF SOLUTIONS	28
7.1. Summary	28
7.2. Passive Design Measures – (Reduce Demand – Be Lean)	30
7.3. Meeting Demand Efficiently - (Be Clean)	33
7.4. LZC Technology - (Be Green)	35
7.5. District Heating Network	38
8. PROPOSALS	40
8.1. Passive Measures – Lean	40
8.2. Block A1	52
8.3. Block A3	53
8.4. Carbon Emissions and Operational Energy Savings	58
9. OVERALL SUMMARY	59
10. APPENDIX 1	60
11. APPENDIX 2	65
12. APPENDIX 3	70

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

1. EXECUTATIVE SUMMARY

1.1. Overview

Ridge have been appointed to provide an Environmental Standards Statement to align with planning policy EN 6 for the new life sciences and purpose-built student accommodation (PBSA) development of Upper Brook Street Masterplan. As part of this Environmental Standards Statement a Standard Assessment Procedure (SAP) for Block A1 and A2 and a Simplified Building Energy Modelling Calculation (SBEM) for Block A3 and Block A1 and A2 amenity areas has been completed to assure compliance with Building Regulations Part L.

1.2. Design Strategy

As part of the low carbon design strategy, the following design initiatives were adopted to reduce the operational energy demand of the building as much as possible. This design strategy has been developed in line with the Energy Hierarchy which has been outlined in section 4.

Be Lean

- Improved fabric performance from the Limiting Building Regulations U-Values of Part L.
- Maximising natural ventilation through openable panels.
- Passive solar control through orientation, layout, form, and glazing percentages.
- Providing sufficient glazing to ensure natural daylighting targets are achieved.

Be Clean

- Efficient LED lighting
- Efficient equipment to reduce unregulated energy load.
- Integrating variable speed pumps and fans to reduce operational energy demand during off-peak hours.
- Occupancy controls on equipment to reduce off-peak energy loads.
- Energy monitoring to develop a real-life picture of energy use and carbon emissions.

Be Green

- Low carbon technologies such as Air Source Heat Pumps
- Roof space identified for future provision of Photovoltaics for onsite electrical generation.

1.3. Results and Conclusion

As a result of the design strategy implemented, the proposed Upper Brook Street Development **complies with planning policy EN6.**

The proposed energy strategy option for Block A1 and A2 using the SAP energy modelling methodology, provides a 64.88% improvement on the target CO₂ emission rate and a 31.57% improvement on the target primary energy rate. The dwelling fabric energy efficiency is also at a 7.88% betterment over the target fabric energy efficiency.

The Part L 2021 regulations generally require a 31% and 27% reduction over Part L 2013 CO₂ emissions targets for domestic buildings and Part L 2013 implemented an improvement of 9% over Building Regs Part L 2010 targets.

Accumulatively, the building regulations have forced roughly 36% improvement over the notional targets since

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

2010. SBEM energy modelling methodology has been undertaken for Block A3 of the Upper Brook Street development, which improves on the 2021 Part L regulations by circa 2% as such the scheme is at a circa 38% betterment over the 2010 Part L Building Regulations.

SBEM energy modelling methodology has also been undertaken for the amenity areas of Block A1 and A2 of the Upper Brook Street development, which improves on the 2021 Part L regulations by circa 7.14%, as such the scheme is at a circa 43.14% betterment over the 2010 Part L Building Regulations.

The above SAP and BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development at the next stages in order to meet the planning requirements of Manchester City Council. The SAP and BRUKL results are shown in Appendix 2.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

2. INTRODUCTION

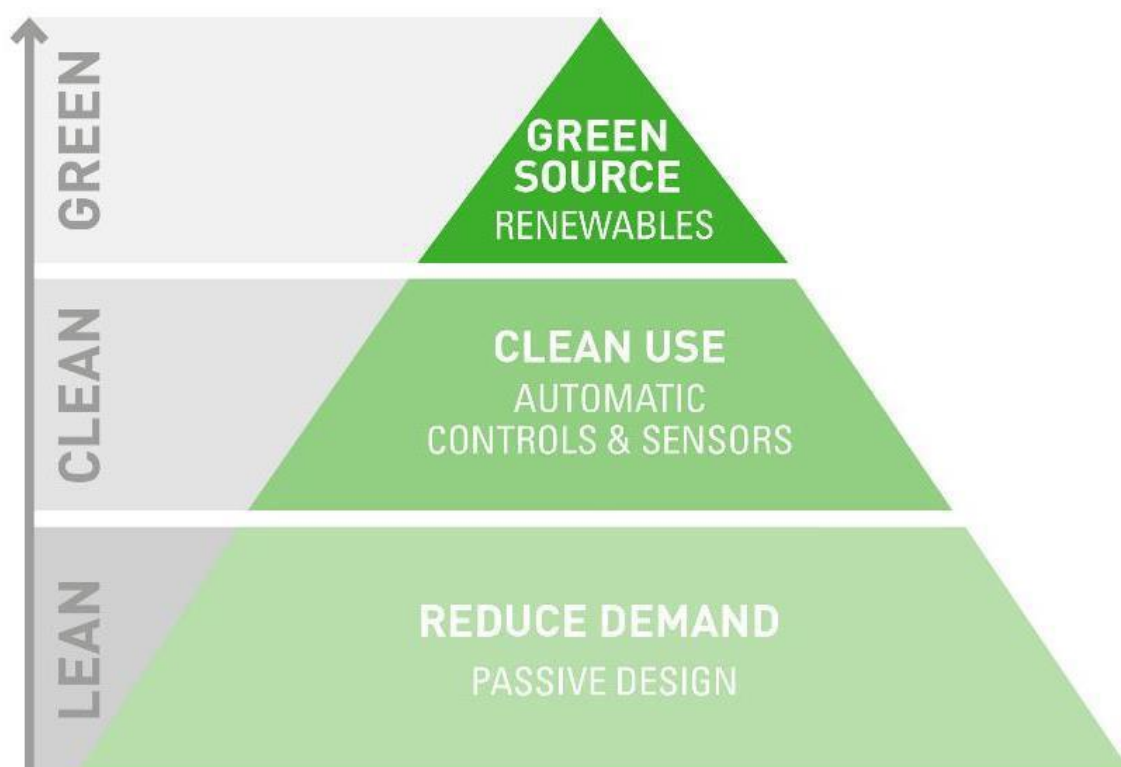
This report has been prepared by Ridge and Partners on behalf of Williams Motor Co (Holdings) and Alliance UBS Limited, to support a full planning application for a life sciences and purpose-built student accommodation (PBSA) development (hereafter referred to as the 'Proposed Development') on the Upper Brook Street Masterplan (hereafter referred to as the 'Site'). The proposal would bring forward development on a previously developed site which is earmarked for commercial and PBSA uses in the Oxford Road Corridor Strategic Regeneration Framework Guidance (SRFG) endorsed by MCC in 2019. This application is accompanied by a comprehensive suite of technical documents, reports and plans.

The purpose of the statement is to summarise the relevant policies both National and Local and demonstrate the ways Ridge & Partners have reviewed various options to promote policies set out in this report and subsequent design.

The document presented below outlines a preliminary low carbon design philosophy followed to develop an energy strategy for the proposed works. The "Energy Hierarchy" methodology provides a design framework which was used to develop the proposed low carbon energy strategy. The approach described by this methodology provides a staged process: LEAN, CLEAN and GREEN (Illustrated below) to assess design measures.

Each stage would focus on the following:

- Lean – Main aim is to reduce the buildings energy demand through "passive measures".
- Clean – Meet the reduced energy demand in the most efficient way possible using "active measures"
- Green – Assess the technical feasibility of incorporating a low or zero carbon technology to further reduce the CO₂ emissions.



ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

2.1. Applicant details

Applicant Name: Williams Motor Co (Holdings) and Alliance UBS Limited

The Proposed Development is being brought forward by Alliance UBS Limited, which is a Joint Venture between Property Alliance Group (PAG) and Moda Living (Moda), and Williams Motor Co (Holdings), the seller.

PAG is an award-winning, full service property company which has a highly successful track record based on 30 years of development and investment in the North West region. This is reflected in their exciting residential, industrial, office, hotel, and student accommodation development pipeline which has been built by their strong team of qualified professionals and in-house asset management team. Recent examples of PAG's success in Manchester include Axis, Oxygen, Renaissance, Piccadilly Place, 55 Portland Street, and 3 St Peters Square.

Moda is the UK's fastest growing residential brand pioneering positive change in the rental sector via its "Next Generation Neighbourhoods" across a range of living platforms. Their student resident neighbourhoods represent an opportunity to reimagine the benefits of renting within a highly amenitised, highly managed, and affordable landlord system attracting student residents from a wide ranging cross section of the community. Their neighbourhoods deliver happy, healthy, and secure living environments with the health and well-being of our residents at their core.

With a UK-wide pipeline of 20,000 homes worth a combined £6.5bn, Moda are investing substantial monies in their Next Generation Neighbourhoods. Moda's key objective is to create inclusive long-term neighbourhoods which exceed the needs of today while enabling agile adaptation to proactively respond to an ever-changing world. The integrated approach of Moda to innovative design solutions coupled with long-term stewardship enables the high-quality of the built and lifestyle environment to be maintained throughout the lifetime of the development. Examples of Moda's success in the North West includes their high-quality residential schemes in Manchester (Angel Gardens), Liverpool (The Lexington) and Leeds (New York Square).

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

3. DEVELOPMENT PROPOSALS

3.1. Site Overview and Location

The Site extends to 2.13 hectares and is bounded by Upper Brook Street (UBS), Grosvenor Street and Kincardine Road with Inchley Road running through the centre. The site comprises the various former Williams Garage buildings and their associated car parking forecourts. These buildings are now vacant and are formed around the Grade II* listed 'Former Unitarian Chapel' (sits outside of the site boundary) which now operates as student accommodation.

The Site is identified for redevelopment within the Oxford Road Corridor Strategic Regeneration Framework Guidance (SRFG) with mixed commercial uses, purpose built student accommodation, and high-density development identified as being a priority for the UBS site.

The Proposed Development forms one element of the wider Upper Brook Street Illustrative Masterplan which can be seen within the submitted Supporting Planning Statement.

The wider illustrative masterplan proposals are being brought forward collaboratively by Property Alliance Group, Moda Living, McLaren Property and Kadans Science Partner. The illustrative masterplan intends to transform the currently vacant sites, re-establishing their important role in the area by re-introducing permeability, public realm, and active community-facing uses at ground floor. The emerging masterplan includes almost 3 acres of new public realm and green spaces, two new public squares, as well as a series of high-quality new buildings of varying heights to provide for c.700,000ft² of sci-tech/life sciences uses, over 1,800 purpose-built student accommodation beds, and c. 25,000ft² of active ground floor uses.

The existing land uses surrounding the site are as follows:

- To the north lays a car park sited adjacent to the Mancunian Way Ring Road. Beyond this, the Ring Road overlooks Princess Street which comprises buildings forming part of the University of Manchester (the John Garside Building and the George Begg Building) which range from 3-15 storeys in height.
- To the east of the Site is Kincardine Road; beyond which the predominant use is 2-storey residential dwellings that form a part of the wider Brunswick Estate. The Brunswick Estate is an area currently undergoing extensive urban regeneration. This direction also comprises a Salvation Army building, the Sheung Lok Wellbeing Centre and Gartside Gardens.
- To the south of the Site lays a temporary paid car park (formerly in use as a Citroën car dealership) alongside the former Elizabeth Yarwood Court residential complex. This land is also identified for redevelopment in the Oxford Road Corridor SRFG and forms Upper Brook Street Masterplan-McLaren/ Kadans'.
- To the west of the Site is UBS, on the opposite side of which is the University of Manchester's Main Campus, which includes the National Graphene Institute, the Manchester Engineering Campus and the Sir Henry Royce Institute, with buildings ranging from 4-storeys to 10-storeys in height.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

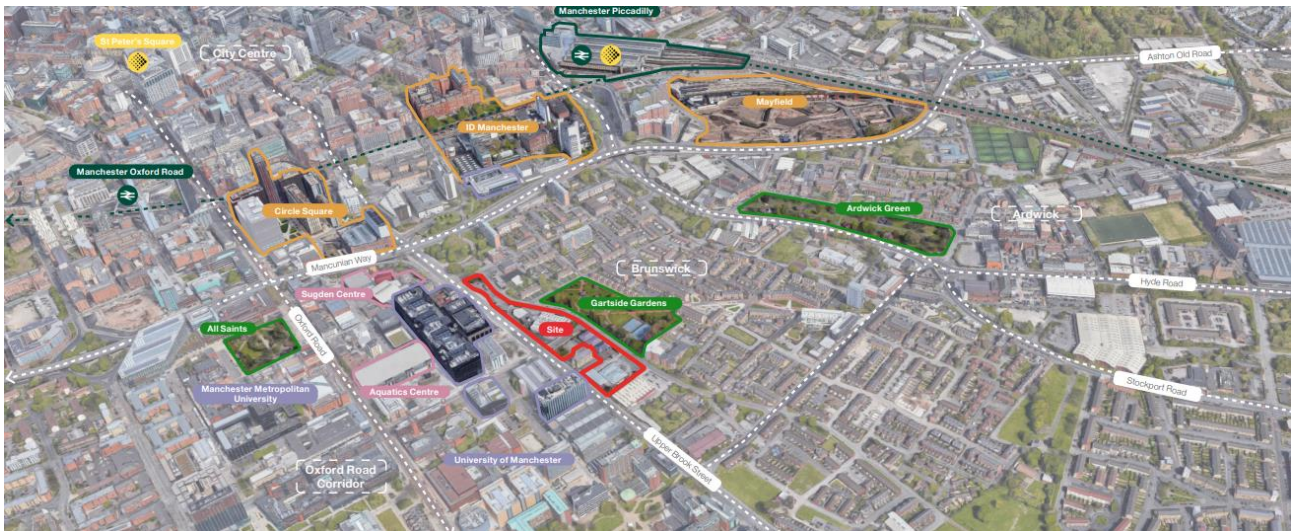


Figure 1 View of the existing site (highlighted in red) and surrounding area

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

3.2. Development Proposals

Full planning application for the demolition of existing buildings and erection of three ground floor + 12/14/29 storey buildings to be used for Purpose Built Student Accommodation (Use Sui Generis), comprising 983 bedrooms in total and 506sqm of ground floor ancillary uses (café/ commercial and convenience store - Use Classes E (a)/(b)/(c)), three buildings comprising ground floor + 5/7/9 storeys for Science and Innovation uses (Use Class E (g)(i) & (ii)) and 834sqm ground floor community uses (retail/ cafés and medical facility (Use Classes E (a)/(b) and (e)), and the provision of new public realm, two new public squares, new access and parking, and associated works.

The proposal would include the clearance of the whole Site comprising demolition of all existing buildings/ structures. Note the red line does not include the Grade II* listed 'Former Unitarian Chapel'.

Purpose Built Student Accommodation (PBSA) - The proposed buildings will provide 983 student bedrooms.

Life Sciences - The proposed buildings will provide approximately 14,045m² of combined laboratory and office space along with a ground floor publicly accessible café and medical facility. The buildings will also house conference space alongside secure cycle store and cycle changing. The massing is split into three buildings surrounding the proposed public square and retaining Grade II* listed 'Former Unitarian Chapel' and the buildings will range from 5 to 9 storeys in height.

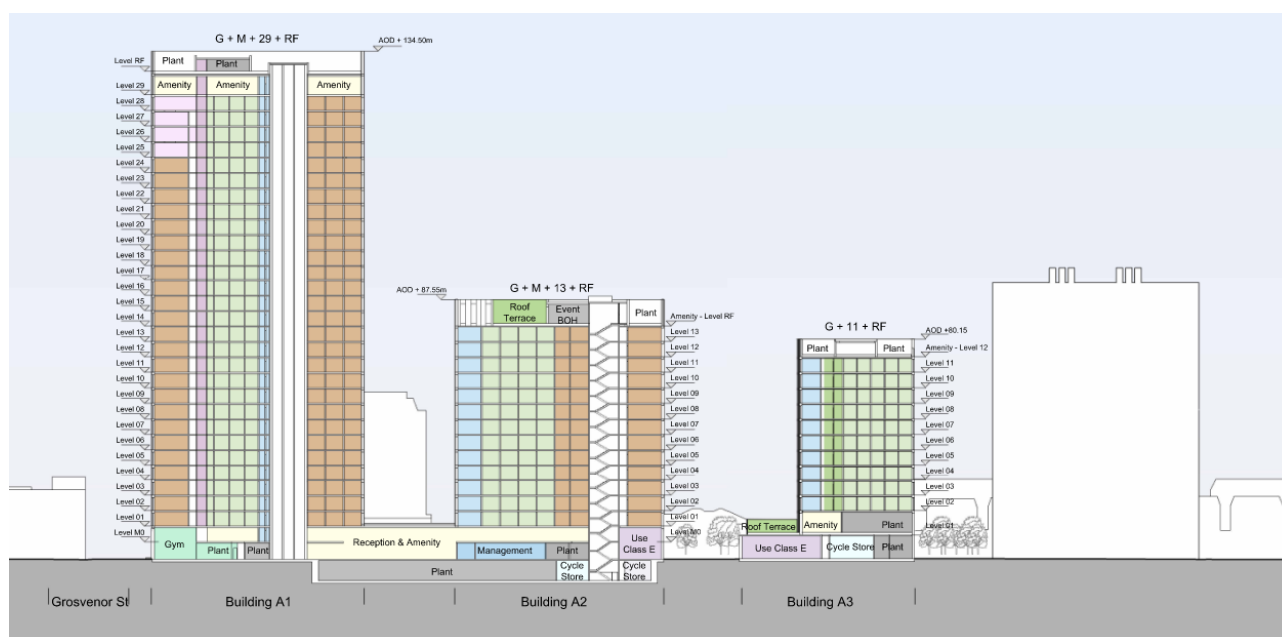


Figure 2 General Arrangement Site Section of Block A1, A2 and A3

simpsonhaugh

BUILDING A1													
	Standard Studio	Accessible Studio	Large Studio	Premium Studio	Duplex Studio	4 Bed Cluster			3 Bed Cluster			Apartments	Total Beds
	no.	no.	no.	no.	no.	no.	standard beds	acc. beds	no.	standard beds	acc. beds	no.	beds
30/Roof													
29													
28	6	-	-	-	-	1	4	-	1	3	-	8	13
27	6	-	-	-	6	1	4	-	1	3	-	14	19
26	9	-	-	-	-	1	4	-	1	3	-	11	16
25	9	-	-	-	3	1	4	-	1	3	-	14	19
24	10	-	2	-	-	1	4	-	1	3	-	14	19
23	10	-	2	-	-	1	4	-	1	3	-	14	19
22	10	1	1	-	-	1	4	-	1	3	-	14	19
21	10	1	1	-	-	1	4	-	1	3	-	14	19
20	10	1	1	-	-	1	4	-	1	3	-	14	19
19	10	1	1	-	-	1	4	-	1	3	-	14	19
18	10	1	1	-	-	1	4	-	1	2	1	14	19
17	10	1	1	-	-	1	4	-	1	2	1	14	19
16	10	1	1	-	-	1	4	-	1	2	1	14	19
15	10	1	1	-	-	1	4	-	1	2	1	14	19
14	10	1	1	-	-	1	4	-	1	2	1	14	19
13	10	1	1	-	-	1	4	-	1	2	1	14	19
12	10	1	1	-	-	1	4	-	1	2	1	14	19
11	10	1	1	-	-	1	4	-	1	2	1	14	19
10	10	1	1	-	-	1	4	-	1	2	1	14	19
9	10	1	1	-	-	1	4	-	1	2	1	14	19
8	10	1	1	-	-	1	4	-	1	2	1	14	19
7	10	1	1	-	-	1	4	-	1	2	1	14	19
6	10	1	1	-	-	1	4	-	1	2	1	14	19
5	10	1	1	-	-	1	4	-	1	2	1	14	19
4	10	1	1	-	-	1	4	-	1	2	1	14	19
3	10	1	1	-	-	1	4	-	1	2	1	14	19
2	10	1	1	-	-	1	4	-	1	2	1	14	19
1	10	1	1	-	-	1	4	-	1	2	1	14	19
Mezzanine													
Ground													
Basement													
SUBTOTAL	270	27	26	0	9	28	112	0	28	66	18	383	523
Planning	306	25	45	0	9	36	144	0	30	99	27	461	649
MIX													
Planning	51.6%	4.2%	5.0%	0.0%	1.7%		21.4%	0.0%		12.6%	3.4%		
	47.1%	3.9%	6.9%	0.0%	1.6%		22.2%	0.0%		15.3%	3.4%		
Planning			63%							37%			
TOTAL			327							416			
Planning			385							264			

[illegible]

BUILDING A2										Total Area	
Standard Studio	Accessible Studio	Large Studio	Premium Studio	Duplex Studio	5 Bed Cluster			Apartments	Total Beds	GIA	
no.	no.	no.	no.	no.	no.	standard beds	acc. beds	no.	beds	Sq. m	Sq. ft
13	8	-	-	-	2	10	-	10	18	10	108
12	8	-	-	-	2	10	-	10	18	201	2162
11	8	-	-	-	2	10	-	10	18	550	5919
10	8	-	-	-	2	10	-	10	18	550	5919
9	8	-	-	-	2	10	-	10	18	550	5919
8	8	-	-	-	2	10	-	10	18	550	5919
7	8	-	-	-	2	10	-	10	18	550	5919
6	8	-	-	-	2	10	-	10	18	550	5919
5	8	-	-	-	2	10	-	10	18	550	5919
4	8	-	-	-	2	10	-	10	18	550	5919
3	8	-	-	-	2	10	-	10	18	550	5919
2	8	-	-	-	2	10	-	10	18	550	5919
1	8	-	-	-	2	10	-	10	18	550	5919
Mezzanine										367	3945
Ground										490	5279
Basement										0	0
SUBTOTAL	104	0	0	0	0	26	130	0	130	234	
Planning	101	0	0	0	0	26	130	0	127	231	
MIX	44.4%	0.0%	0.0%	0.0%	0.0%	55.6%	0.0%			8217	88442
Planning	43.7%	0.0%	0.0%	0.0%	0.0%	56.3%	0.0%			7850	84497
Planning	44%				56%						
TOTAL	44%				56%						
Planning	104				130						
	101				130						

12

Figure 5 - Block A3 Unit Mix Area Schedule

13

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

4. ENERGY HIERARCHY

In line with the definition of zero carbon an energy hierarchy has been created (see figure 3 below). Under Policy EN4 developers will initially be expected to secure high levels of energy efficiency and low energy demand. This is followed by the incorporation of on-site measures where these exist, such as low or zero carbon energy technologies and directly connected heat (not necessarily on-site).

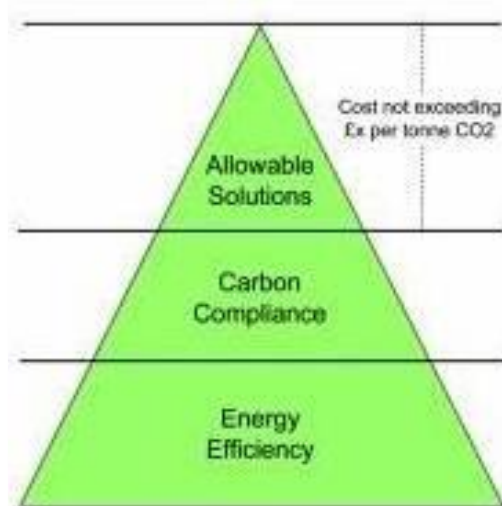


Figure 6 - Energy Hierarchy

However, in order to achieve the highest level of carbon reductions, it is intended that developers will be able to contribute to or co-ordinate investment in near or off-site infrastructure. This could include, for example, the connection of buildings to district heating networks and investment in low or zero carbon technologies on buildings owned by the city or by public and community institutions. Further guidance on these 'allowable solutions', possibly in the form of a Supplementary Planning Document (SPD), will be given following further national guidance on this matter expected from the Local Planning Authority.

4.1. Decarbonisation of the Electricity Grid

The National Grid in the UK is decarbonising rapidly. This permits the electrification of heat and heralds the end to combustion of fossil fuels as the main source of heating. The attractive alternative to combustion is heat transfer using heat pumps linked to ground source or air source energy.

The carbon factor of grid electricity was 495 grams of CO₂ for each kWh of electricity generated in 2014 according to Defra. This fell by 6.5% to 462 grams in 2015, and by a further 10.8% to 412 in 2016.

The Department for Business, Energy and Industrial Strategy (BEIS) published its Energy and Emissions Projection (EEP) in October 2020 showing the projected Grid Carbon Factor falling dramatically from 156 grams in 2019 to just 67 grams in 2040.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

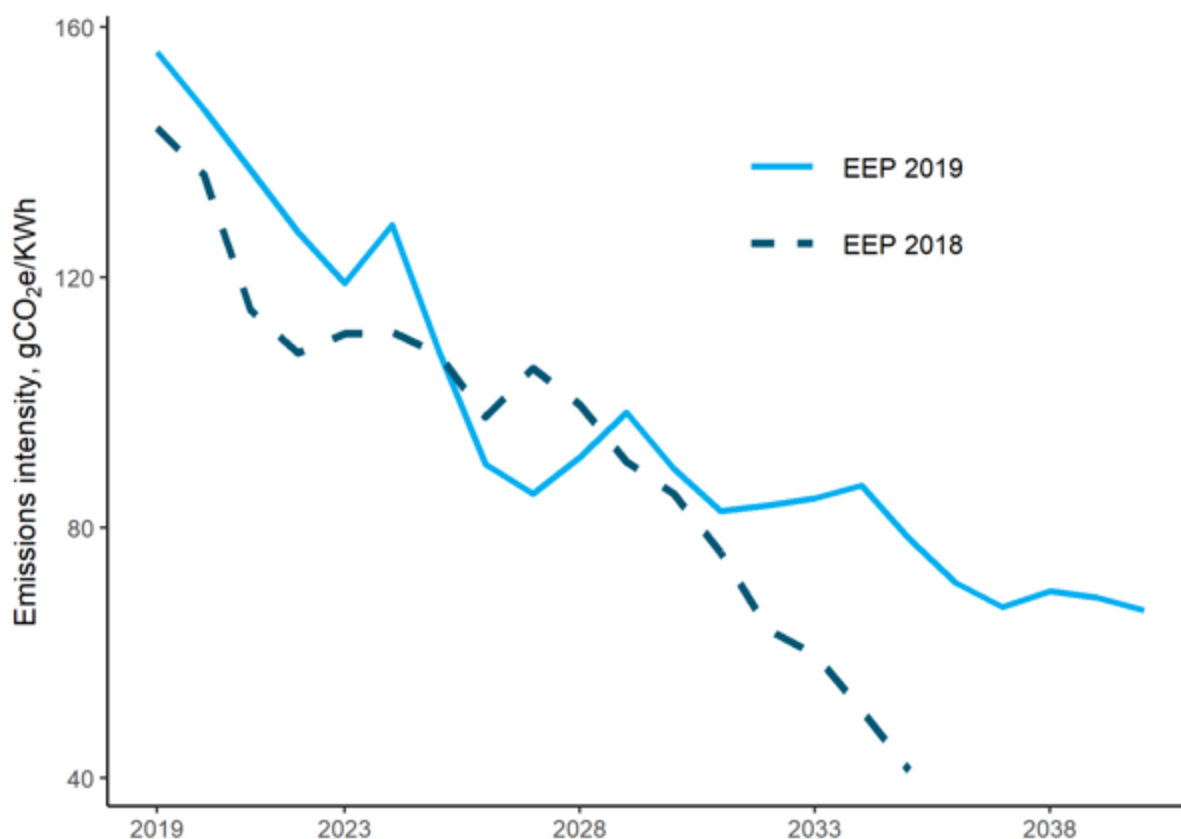


Figure 7 - Predicted Reduction in Grid Carbon Factor

Furthermore, the UK Government has passed laws that require the country to reduce all greenhouse gas emissions to net zero by 2050 and the phasing out of natural gas as a source of heating with gas heating to be banned in new build properties from 2025.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

5. GOVERNMENT REVIEW POLICY

5.1. National Policy Framework

The Building Establishment's Environmental Assessment Method (BREEAM) is the world's leading and most widely used environmental assessment method for commercial buildings. A revised National Planning Policy Framework (NPPF) was updated and published in July 2021 which sets out the Government's planning policies for England and how they are expected to be applied. This framework replaces that published in February 2019. This framework states the purpose of Sustainable development that:

'The purpose of the planning system is to contribute to the achievement of sustainable development.'

This highlights sustainability as a critical issue that runs throughout all the planning policies. The National Planning Policy Framework (NPPF) defines sustainable development in agreement with the U.N. definition of "meeting the needs of the present without compromising the ability of future generations to meet their own needs." The NPPF outlines how three overarching objectives need to be pursued in mutually supportive ways to achieve sustainable development. These objectives are outlined below.

The environmental objective of this framework is to:

- Contribute to protecting and enhancing our natural, built, and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

At the heart of the Framework is a 'presumption in favour of sustainable development.' Section 14 of the National Planning Policy Framework (NPPF) specifically addresses the challenge of climate change. It states that: 'New development should be planned for in ways that:

- Avoid increased vulnerability to the range of impacts arising from climate change. When new developments are brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and can help to reduce greenhouse gas emissions, such as through its location, orientation, and design. Any local requirements for the sustainability of buildings should reflect the government's policy for national technical standard Local Plan and supplementary guidance.'

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

5.2. The Greater Manchester Combined Authority (GMCA)

The GMCA declared a climate emergency in July 2019 and launched a plan in March 2020 following 12 months collaboration and consultation with representatives from areas across the city region. The plan omits the actions needed to achieve a 50% reduction in CO₂ emissions between 2020 and 2025 and actions to support the city to be carbon neutral by 2038.

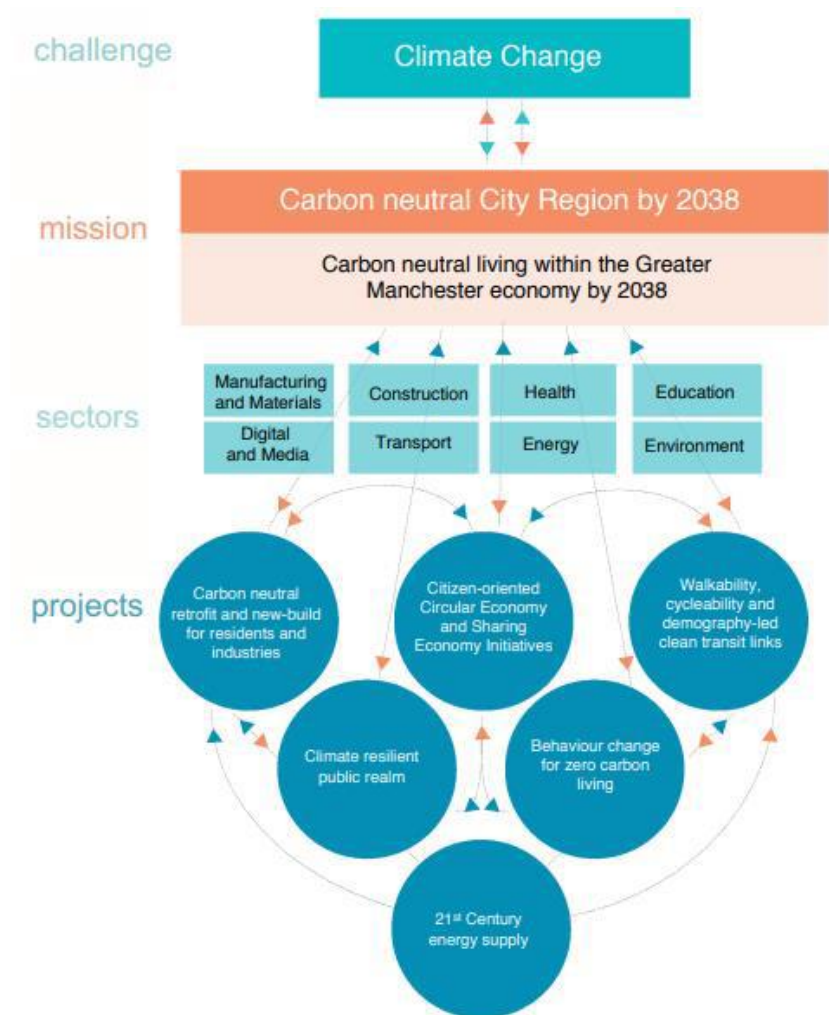


Figure 8 - Potential components of a Greater Manchester clean growth mission

5.3. Manchester Core Strategy

This is the principal document of Manchester City Council as the local planning authority's Development Plan of which the following policies are of most relevance:

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:

All development must follow the principal of the Energy Hierarchy, being designed:

- o To reduce the need for energy through design features that provide passive heating, natural light and cooling

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

- o To reduce the need for energy through energy efficient features such as improved insulation and glazing
- o To meet residual energy requirements through the use of low or zero carbon energy generating technologies

Wherever possible new development and retrofit projects, including energy generation plant, must be located, and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.

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 scheme and/or to incorporate provision to enable future connection to any existing/potential decentralised energy schemes.

The use of building material with low embodied carbon in new development and refurbishment.

Policy EN 5 - Strategic Areas for low and zero carbon decentralised energy infrastructure: Within Manchester it is considered that the following strategic areas, indicated on the key diagram, 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
- Strategic employment locations



Figure 9 - Key Diagram

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

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

energy proposals plans. The Council will work with all relevant stakeholders, which may include developers, landowners, residents, community groups, private sector partners, utilities companies, neighbouring authorities and other public sector bodies, as appropriate, to bring forward such plans.

Where investment or development is being undertaken into or adjacent to a public building / asset or district heating network, full consideration shall be given to the potential role that these can have in providing an anchor load within a decentralised energy network or in creating opportunities for CO₂ reduction funded by contributions.

Policy EN 6 - Target Framework for CO₂ reduction from low or zero carbon energy supplies: Application for residential development of 10 or more units and all other development over 1,000 sq m will be expected as a minimum to meet the target shown in Tables 12.1 or 12.2, unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO₂ emissions for all phases of the development.

Developments smaller than the above threshold but involving the erection of a building or substantial improvement to an existing building will also be expected to meet the minimum target, where viable, but will not be expected to submit an energy statement.

The target framework relates to three broad development locations and their potential for low and zero carbon, decentralised energy. The areas are defined as follows:

- Target 1 Network development areas: locations where the proximity of new and existing buildings, the mix of uses and density of development provide the right conditions to support district heating (and cooling)
- Target 2 Electricity intense areas: location where predominant building type has an all-electric fit-out such as retail units and leisure complexes
- Target 3 Micro-generation areas: locations where lower densities and a fragmented mix of uses tend to mean that only building scale solutions are practical

Table 12.1 - Domestic CO₂ emissions reduction targets

Target	% Minimum Requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2: Electricity intense buildings	+15% increase on Part L 2010
Target 3: Micro generation area	+ 15% increase on Part L 2010

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Table 12.2 - Non-domestic CO₂ emissions reduction targets

Target	% Minimum Requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2: Electricity intense buildings (Applies to commercial uses with high proportion of emissions from electricity use (>45 kg CO₂/m²))	10% increase on Part L 2010
Target 3: Micro generation area	+ 15% increase on Part L 2010

Where the CO₂ emissions reduction required under any future revision to Part L of the building regulations becomes greater than the '% Minimum requirement', the reduction required under building regulations would apply.

Where the Council identifies an 'allowable solution', for example within an energy proposals plan, that would produce higher carbon reductions at no extra cost than that of achieving the '% Minimum requirement' (or required under building regulations if greater) the higher percentage reduction will be required. The cost comparison is based on the cost of incorporating the 'allowable solution' at design stage.

The energy statement will be required to be submitted at the outset of any proposed development (outline application or before). 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, subject to the energy statement incorporating evidence such as modelling to demonstrate compliance.

Guidance on what the energy statement should contain and how to decide which target applies to a development proposal is given in Appendix A of 'Manchester's Local Development Framework, Core Strategy Development Plan Document, Adopted 11th July 2012'.

Policy EN8 - Adaptation to Climate Change: All new development will be expected 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 through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways
- The need to control overheating of buildings through passive design
- 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 evidence to quantify their contribution to compliance.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

5.4. The Emerging Places for Everyone Joint Development Plan

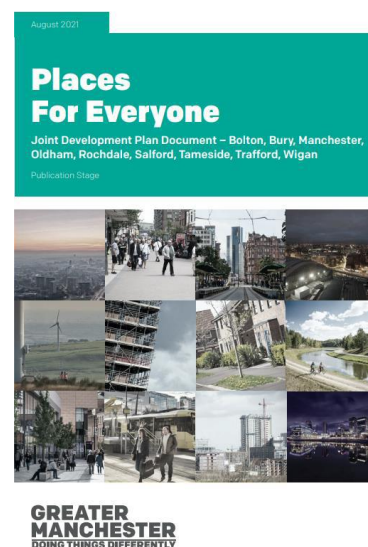
The emerging places for everyone joint development plan states:

‘The Places for Everyone Joint Development Plan of Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, and Wigan Councils is at the heart of our proposals to improve employment opportunities for our communities, build the right homes in the right places, rejuvenate green spaces and reshape town centres. As a long-term plan for jobs, new homes, and sustainable growth it will enable us to build back from the COVID-19 pandemic in a way that brings everyone with us and tackles the inequality experienced by so many of our communities’.

Policy JP-S- 1 - 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. Preference will be given to using previously-developed (brownfield) land and vacant buildings to meet development needs. 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

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:

1. Promoting the retrofitting of existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling;
2. Promoting the use of life cycle cost and carbon assessment tools to ensure the long term impacts from development can be captured;
3. Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;
4. Keeping fossil fuels in the ground;
5. Planning for a balanced and smart electricity grid by identifying geographical locations which could support energy assets;
6. Increasing the range of nature based solutions including carbon sequestration through the restoration of peat-based habitats, woodland management, tree-planting and natural flood management techniques;
7. Development of Local Area Energy plans to develop cost effective pathways to achieve carbon targets;
8. An expectation that new development will:
 - a. Be net zero carbon from 2028 by following the energy hierarchy (with any residual carbon emissions offset), which in order of importance seeks to:
 - i. Minimise energy demand;
 - ii. Maximise energy efficiency;
 - iii. Utilise renewable energy;
 - iv. Utilise low carbon energy; and
 - v. Utilise other energy sources.
 - b. Incorporate adequate electric vehicle charging points to future proof for the likely long-term demand, taking account of the potential maximum energy demand for the site;



ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

- c. 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;
- d. 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.

- e. For non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.
- f. 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.

District Local Plans may set out specific carbon emission reduction targets, particularly if carbon neutral targets have been set sooner than 2038, or promote other measures through which energy efficiency of buildings and renewable energy generation can be achieved.

Policy JP-S- 3 - 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 will be identified where:
 - a. Existing heat/energy networks are operational or have been commissioned;
 - b. Proposals for new heat networks/energy networks are being progressed, or future opportunities have been identified in city-region master planning;
 - c. Sufficient density of existing heat demand occurs; and
 - d. Significant future development is proposed at the strategic development locations.
2. Within the identified "Heat and Energy Network Opportunity Areas", there will be:
 - a. A requirement that new residential developments that are '10 dwellings or more' or other developments over 1,000 m² floorspace should evaluate the viability of:
 - i. Connecting to an existing or planned heat/energy network (where such a network has been identified within the Heat Network Opportunity Areas); and/or
 - ii. Installing a site-wide or communal heat/energy network solution.
 - b. A requirement, where unviable to connect to an existing network or install a site-wide or communal heat/energy network, for new development to incorporate appropriate capability to enable future connection (e.g. adequate space in plant-room for plate heat exchangers, capped-off flow/return connections);
 - c. A 'presumption in favour of network connection' where new residential developments over 10 dwellings and other developments over 1,000 sq m floor space are within 500m of an existing heat network, or where a network is being delivered;
 - d. An expectation that new industrial development will demonstrate that opportunities for using waste heat locally have been fully examined, and included in proposals unless proven to not be viable;
 - e. An expectation that where publicly-owned buildings and assets adjoin new major development sites, opportunities for these buildings and assets to connect to site-wide proposals will be considered; and

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

- f. An expectation that any site-wide networks will be designed so as to enable future expansion to adjoining buildings or assets as appropriate.
- 3. In support of the above, all decentralised heat/energy network viability assessments are required to demonstrate consideration and analysis of:
 - a. Identification of existing and proposed heat/energy loads;
 - b. Identification of heat/energy supply sources;
 - c. Identification of opportunities to utilise renewable and low carbon energy sources;
 - d. Identification of opportunities to utilise waste and secondary heat sources;
 - e. Impact of proposals and technology choices on local air quality;
 - f. Design according to national best practice in relation to efficient heat network design (e.g. CIBSE CP1 Heat Networks: Code of Practice for the UK(42), or equivalent); and
 - g. Adopting appropriate consumer protection standards (e.g. HeatTrust(, or equivalent).

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

6. REGULATORY FRAMEWORK

6.1. Building Regulations

Part L 2021 came into effect in June 2022 with a transitional period of 12 months and will act as an uplift to help the construction industry adapt to changing regulations and low carbon heating. Figure 7 shows the timeline for the new Part L regulations and displays that the new regulations will require a 31% and 27% reduction in CO₂ emissions compared to the previous 2013 regulations for domestic buildings and non-domestic buildings respectively.

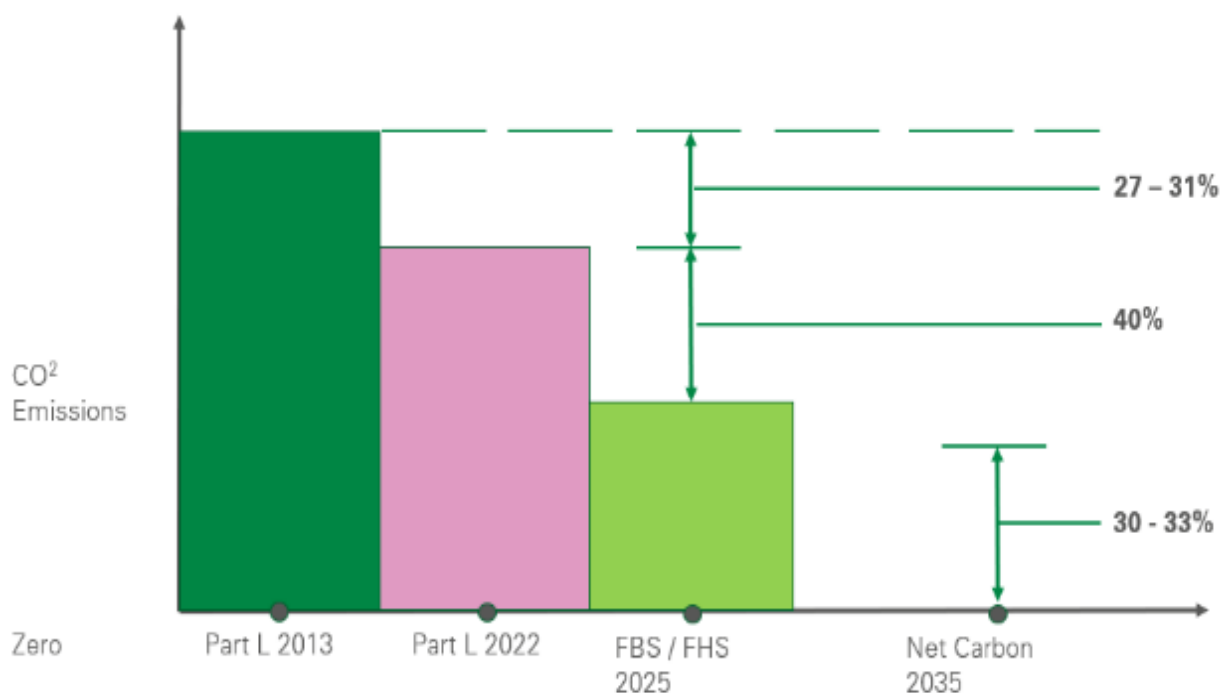


Figure 10 - Part L 2022 Changes

The future building standards which will come into effect in 2025 will require CO₂ emissions to be further decreased by 40% in comparison to current figures. The timeline for the future buildings standards is displayed in figure 8:

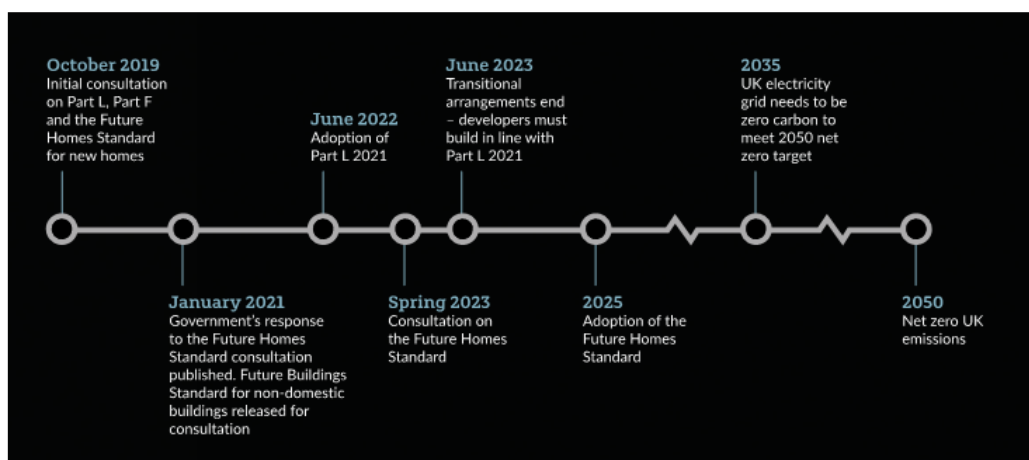


Figure 11 - Future Homes Standard

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Part L volume 1 Key Changes (Domestic buildings)

- 31% less CO₂ reduction compared to current regulations.
- No ban on use of gas boilers.
- Local planning authorities will retain powers to set higher energy efficiency targets than building regulations.
- All new builds to be air tightness tested and reducing unwanted air infiltration in existing dwellings.
- Improve accuracy of as built energy calculations

Part L volume 2 Key Changes (Non-Domestic buildings)

- New non-domestic buildings to be 27% less CO₂ than current regulations.
- Encourage use of low carbon systems and high levels of building fabric.
- Uplift in the efficiencies of building services.
- Update to SBEM and NCM modelling guide.
- Uplift to limiting U-values and air permeability.
- Air tightness in existing buildings – reducing unwanted air filtration.
- Maximum flow temperature of 55°C in wet space heating systems.

A new performance metric has also been ushered in, primary energy will become the principle measure replacing CO₂ emissions as the main metric. The result of this is that CO₂ emissions will become less effective as a measure of energy performance as the electricity grid becomes decarbonised. If not addressed, this could result in a dwelling with low CO₂ emissions complying with regulations, despite having excessively high energy consumption. Consequently, the Primary Energy metric has been introduced to ensure that energy efficiency is directly measured rather than assuming it is linked to CO₂ emissions. Any plans/notices submitted after June 2022 must adhere to the new Part L standards.

6.2. BREEAM

The Building Establishment's Environmental Assessment Method (BREEAM) is the world's leading and most widely used voluntary environmental assessment method for commercial buildings that aims to quantify and reduce the environmental impact of buildings in a robust and cost effective manner.

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
- Waste

The assessment process provides in a report that covers the areas assessed, along with a formal certification on a scale of UNCLASSIFIED, PASS, GOOD, VERY GOOD, EXCELLENT and OUTSTANDING.

The assessment process provides in a report that covers the areas assessed, along with a formal certification on a scale of UNCLASSIFIED, PASS, GOOD, VERY GOOD, EXCELLENT and OUTSTANDING.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

The diagram adjacent shows how the BREEAM assessment scores and rates a building:

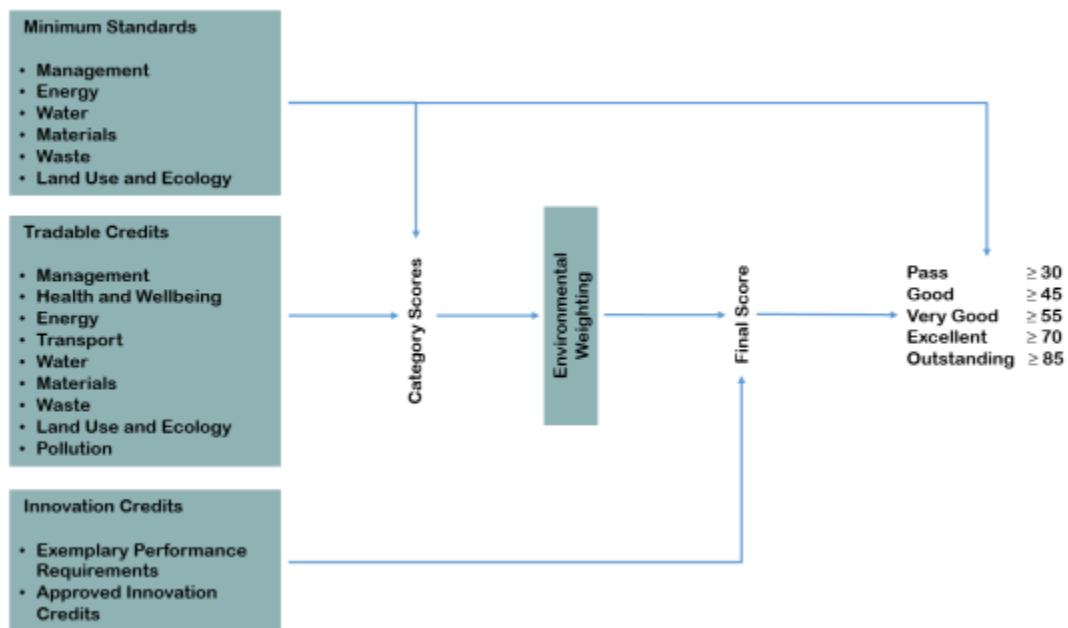


Figure 12 - Process for Awarding BREEAM Ratings

The BREEAM categories include a number of environmental elements that reflect the different options available when designing, procuring and constructing a building. Each environmental element has credits available that are awarded when compliance has been demonstrated.

For the building to meet a specific BREEAM rating, there are a series of minimum standards that must be achieved for that rating to be awarded.

In addition to the credits, there are also innovation credits available that provide additional recognition of sustainable performance that goes beyond what is currently recognised and rewarded by the standard BREEAM credits.

The innovation credits are awarded for either meeting the BREEAM exemplary level requirements or by an application to BRE to have a specific feature, system or process recognised as 'innovative'.

Each different BREEAM section has an environmental weighting applied to the scores which calculates the final BREEAM score. These factors have been derived from consensus based research with groups such as the government, suppliers and lobbyists.

The weightings are:

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Environmental section	Weighting			
	Fully fitted out	Simple building	Shell and core only	Shell only
Management	11%	7.5%	11%	12%
Health and Wellbeing	14%	16.5%	8%	7%
Energy	16%	11.5%	14%	9.5%

Environmental section	Weighting			
	Fully fitted out	Simple building	Shell and core only	Shell only
Transport	10%	11.5%	11.5%	14.5%
Water	7%	7.5%	7%	2%
Materials	15%	17.5%	17.5%	22%
Waste	6%	7%	7%	8%
Land Use and Ecology	13%	15%	15%	19%
Pollution	8%	6%	9%	6%
Total	100%	100%	100%	100%
Innovation (additional)	10%	10%	10%	10%

Once the weightings have been applied, the score is then assigned a BREEAM rating as follows:

BREEAM RATING	% SCORE REQUIRED
Outstanding	≥ 85
Excellent	≥ 70
Very Good	≥ 55
Good	≥ 45
Pass	≥ 30

At this stage it is difficult to predict the exact number of BREEAM credits achievable by each Low and Zero Carbon Technology. These technologies will have an influence over the following:

- Ene 01 – Energy Performance – Up to 9 credits are available
- Ene 01 – Predicting Operation Energy use – Up to 4 credits are available
- Ene 04 – Low and Zero Carbon Technologies – Up to 3 (+1 innovation) credits are available
- Pol 02 – Local Air Quality – Up to 2 credits are available.

The Manchester City Council have set as a minimum, that, student halls and commercial developments are to achieve BREEAM Very Good for new developments. This development will target an excellent rating.

7. APPRAISAL OF SOLUTIONS

7.1. Summary

The strategic approach outlined, follows a specific appraisal of technologies at each stage of design and to achieve the overall goal of CO₂ reduction. As on the whole it becomes more expensive to implement carbon reduction measures the further along the design process as the opportunities to reduce demand diminish.

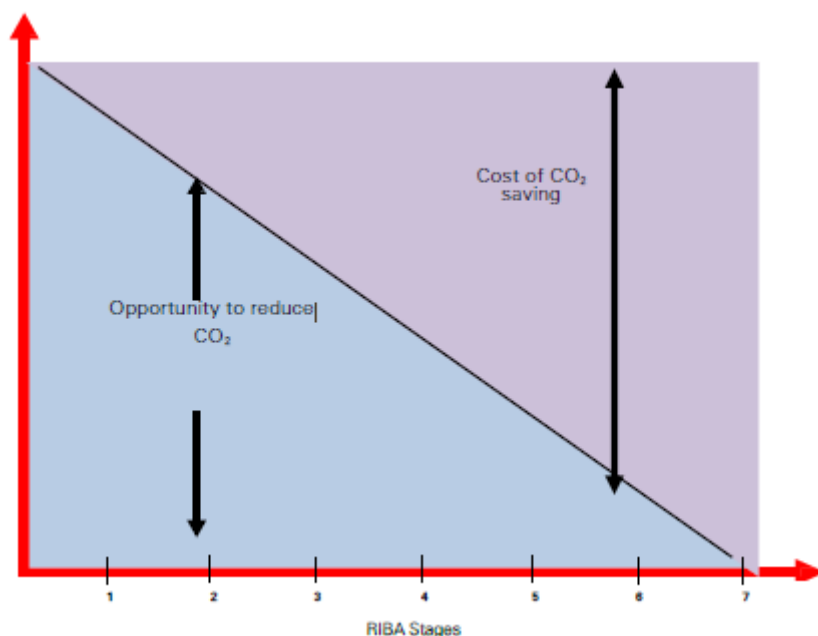
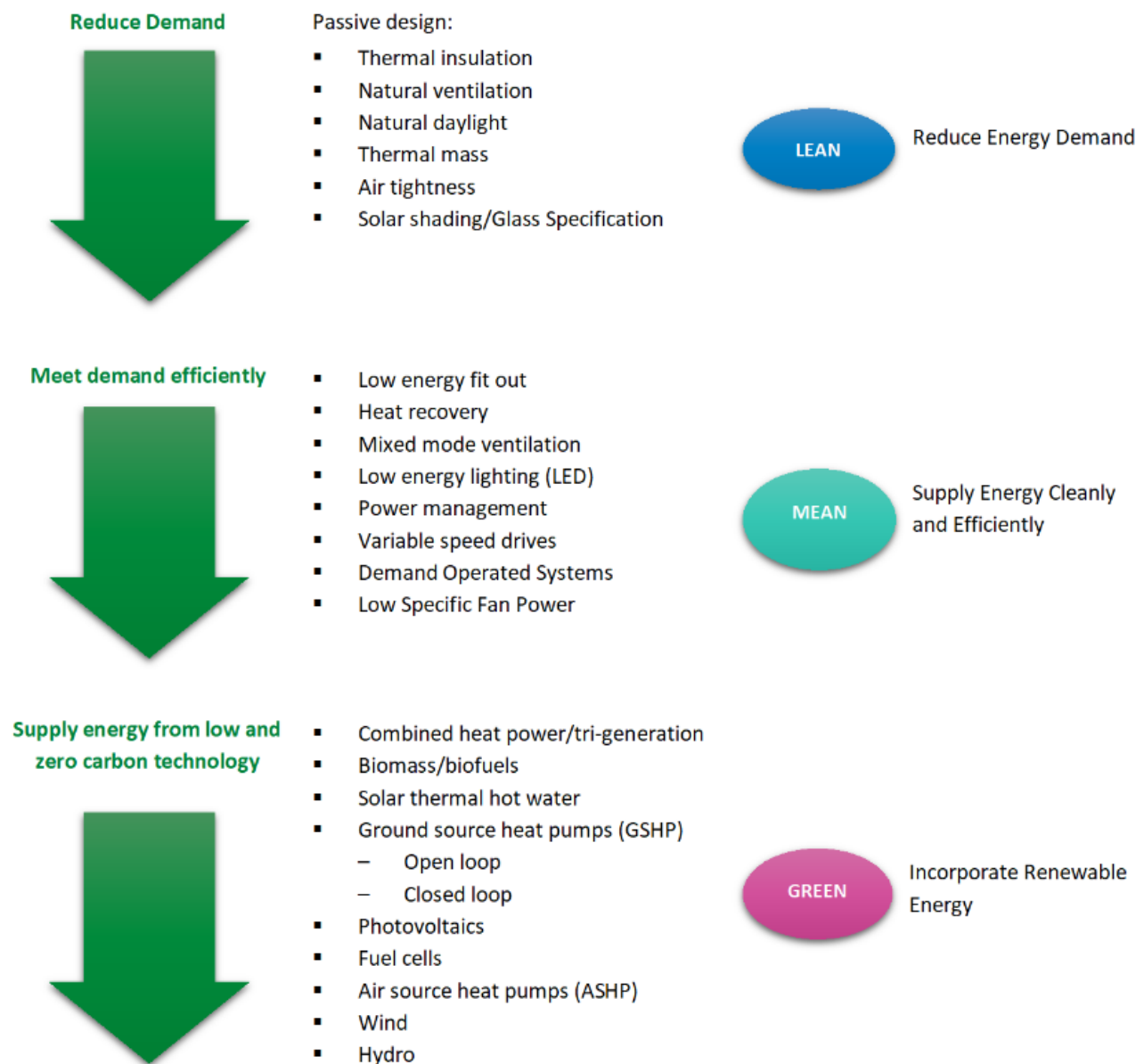


Figure 13 - Costs of implementing design measures at each RIBA Stage

In this first instance it is therefore essential that the buildings 'passive measures' are optimised and the design team work in close collaboration with the user team to consider the future fit out demands. The next stage is to adopt 'efficient technologies' such as heat recovery and variable speed drives etc. to meet the demand efficiency with the final approach of applying 'renewable and low carbon' technologies accordingly.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Our approach has followed the following route:



7.2. Passive Design Measures – (Reduce Demand – Be Lean)

This section looks at the proposed measures that will ensure the initial demand for energy in the building is low from the outset using passive measures.

The **site location** is in central Manchester, with **weather** typical of the North-west. Mild conditions are present throughout the year, with relatively high rainfall and cloud cover expected throughout the year.

In terms of expected **building occupancy**, these are expected to be typical of buildings of this type with variable usage in the purpose built student accommodation (PBSA) generally but high occupancy in the weekday evenings and weekends.

The following measures are to be incorporated in the design:

- Passive Design
 - Thermal Insulation and Thermal Bridging
 - Natural Ventilation
 - Natural Daylight
 - Thermal Mass
 - Air tightness
 - Solar Shading
 - Adaption to climate change

These measures promote the reduction of Energy use and carbon emission in the first instance.

The passive design features at Upper Brook Street mean that the building is well adapted to these risks.

Firstly, the energy demand has been reduced and therefore the building will be less affected by the decreased availability of energy.

Secondly, the building will have a lower carbon footprint helping to stop the effects of climate change from increasing any further.

The expected increase in external temperatures could result in future overheating problems. Whilst the building cannot be relocated, by having low g-value glass, there is less solar heat gain entering the rooms.

The demand for cooling has also been reduced through the adoption of efficient building services and by exceeding the u-values stated in the Building Regulations.

This combination of passive design measures act to stabilise the temperatures within the building and enable it to adapt to the likely extremes of both high and low temperatures.

Key:
Y – Yes could be incorporated
P – Possible
N – Not appropriate

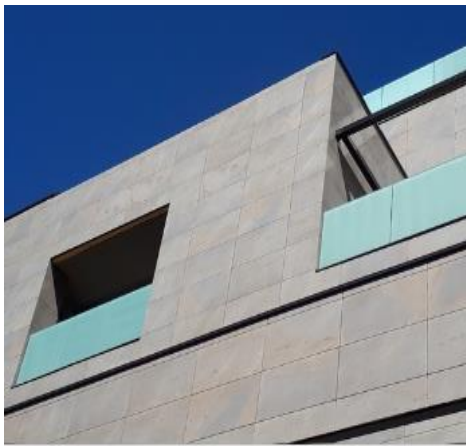
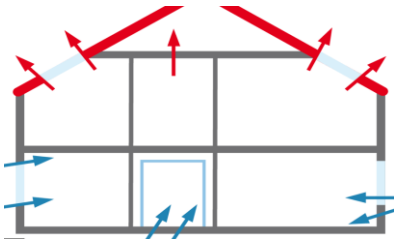
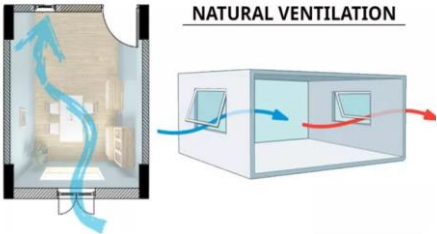
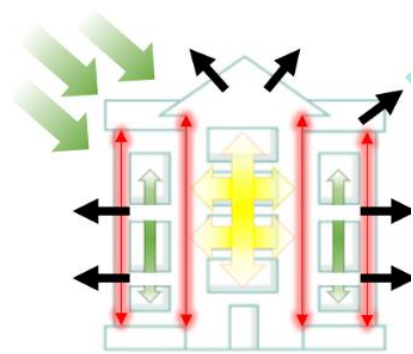
Measure	Description	Suitable For Consideration	Commentary
Thermal Insulation 	Thermal insulation is the reduction of heat transfer (i.e., the transfer of thermal energy between objects of differing temperature) between objects in thermal contact or in range of radiative influence.	Y	Insulation is central to low energy construction to reduce unnecessary heat loss. The Part L building regulations set out limiting efficiencies for thermal insulation which we intend to improve on shown in the table to the left. This will reduce the energy required to heat the spaces in the proposed new building. The future building standards will also need to be considered. This will come into effect in 2025 and will require CO₂ emissions to be further decreased by 40% in comparison to Part L 2021 current figures therefore careful consideration of thermal insulation must be made at design stage. The development will adapt a high level of thermal insulation to reduce heat loss and thus reduce overall energy demand. Thermal insulation is essential to minimise heat losses and minimum standards Building Regulation U-Values will be matched or exceeded.
Air Tightness 	Airtightness is the control of air leakage, i.e. the elimination of unwanted draughts through the external fabric of the building envelope. This may be achieved by the correct and proper installation of a vapour check or vapour barrier.	Y	The development will target an air tightness that exceed the minimum requirements of Part L 2021 building regulations to reduce air infiltration and unwanted draughts through the external fabric of the building envelope and so heating and cooling energy demand will be lowered.
Natural Ventilation 	Natural ventilation is a method of supplying fresh air to a building or room by means of passive forces, typically by wind speed or differences in pressure internally and externally. During design, natural ventilation is first considered before mechanical ventilation because this reduces carbon emissions.	Y	Natural ventilation to be used in a mixed mode approach with mechanically powered ventilation using MVHR units to counter space overheating. This will help to reduce on site carbon emissions by the avoidance of operating electrically driven ventilation fans and cooling plant. The internal planning, building geometry and external topography will be optimised to take full advantage of natural ventilation. Ventilation panels will provide a level of natural ventilation to the rooms
Natural Daylight 	Natural light is light that is generated naturally, the common source of which is the Sun. This is as opposed to artificial light, which is typically produced by electrical appliances such as lamps.	Y	To reduce the energy used for artificial lighting the natural daylight entering occupied spaces will be maximised by optimising window size and orientation. Dimmable lighting with photocells will sense if the illuminance level of the space has been met and reduce lighting levels as required. North facing windows are particularly effective at providing useful daylight and will be incorporated on the building. The buildings orientation and fenestration strategy will take advantage of passive solar gains and natural daylight to reduce heating energy and the need for artificial lighting.
Solar Shading 	Solar shading is a method by which solar radiation in the form of heat and light can be mitigated in a building. While natural heat and light are essential in most buildings and modern architecture uses it more and more there are occasions when the levels are too high. This leads to overheating and too much light. Solar shading is a general term for a range of methods used to reduce the amount of solar gain.	N	Whilst maximising daylight care must be taken to ensure that direct sunlight does not cause glare in the spaces and does not cause excessive solar gains in summer which will cause spaces to overheat. This is managed by solar shading on affected windows. Some examples of solar shading are: canopies, solar control glazing, balconies, internal blinds and curtains which could be adopted on this development. Solar shading not adopted on this scheme, however low G-value glass design will help prevent unwanted heat gains.

Table 4.1 Limiting U-values for new or replacement elements in new and existing buildings and air permeability in new buildings

Element type	Maximum U-value ⁽¹⁾ W/(m ² ·K) or air permeability
Roof (flat roof) ⁽²⁾	0.18
Roof (pitched roof) ⁽²⁾	0.16
Wall ⁽²⁾⁽³⁾	0.26
Floor ⁽⁴⁾⁽⁵⁾	0.18
Swimming pool basin ⁽⁶⁾	0.25
Windows in buildings similar to dwellings ⁽⁷⁾⁽⁸⁾	1.6 or Window Energy Rating ⁽⁹⁾ Band B
All other windows, ⁽¹⁰⁾⁽¹¹⁾ roof windows, curtain walling	1.6
Rooflights ⁽¹²⁾⁽¹³⁾	2.2
Pedestrian doors (including glazed doors) ⁽¹⁴⁾	1.6
Vehicle access and similar large doors	1.3
High-usage entrance doors	3.0
Roof ventilators (including smoke vents)	3.0
Air permeability (for new buildings)	8.0m ³ /(h·m ²) @ 50Pa

Thermal Mass



Thermal mass describes a materials capacity to absorb, store and release heat. For example, water and concrete have a high capacity to store heat and are referred to as 'high thermal mass' materials. Insulation foam, by contrast, has very little heat storage capacity and is referred to as having 'low thermal mass'. A common analogy is thermal mass as a kind of thermal battery. Though thermal mass has always been an aspect of buildings, only in recent years has it evolved as a tool to be deployed in the conservation of energy. However thermal mass does not offer a 'one size fits all' concept.

N

Thermal mass such as concrete can absorb large amounts of heat energy which prevents spaces from overheating. The thermal mass can be cooled overnight when the space is not occupied to further reduce energy needed for cooling when the space is occupied.

Medium lightweight structure but roof will be concrete.

Adaption to climate change



Average temperatures for central England have risen by approximately 1°C since the 1970s and this has resulted in higher temperatures, changing rain patterns, rising sea levels, in addition to unpredictable extreme weather events such as floods, droughts and freezing winters. Risks of climate change include the increased likelihood of increased external temperatures which could lead to staff illness and therefore lower productivity, damage to equipment due to the high internal building temperatures in addition to increased cooling demand.

Y

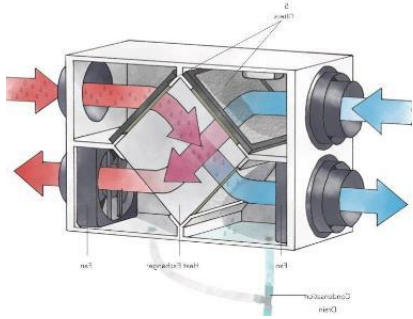
An uplift in fabric improvements and solar shading on a development can maximise the retention of heat in winter and reduce solar gains in summer. These actions will help combat the extremes expected as a result of climate change.

7.3. Meeting Demand Efficiently - (Be Clean)

This section looks at technologies that will be used to ensure that energy demand is further reduced and met efficiently:

- Ventilation
- Heat recovery
- Demand Operated Systems
- Variable Speed Drives on fans and pumps
- Power Management
- LED Lighting
- Waste Water Heat Recovery
- BMS
- Low Energy Fit out
- Sub Metering

Key:
Y – Yes could be incorporated
P – Possible
N – Not appropriate

Technology	Description	Suitable For Consideration	Commentary
Mechanical Ventilation Heat Recovery (MVHR) 	MVHR provides fresh filtered air into a building whilst retaining most of the energy that has already been used in heating the building. Heat Recovery Ventilation is the solution to the ventilation needs of energy efficient buildings.	Y	Where fresh air is supplied, and stale warm air extracted by mechanical ventilation, heat recovery will be used to recycle up to 85% of the heat from the extracted air to warm the incoming air. The re-use of waste heat in the mechanical ventilation systems could provide a significant step towards reducing CO₂ emissions. Local Mechanical Ventilation Heat Recovery (MVHR) units to incorporate heat recovery where provided. MVHR units will serve individual bedrooms and cluster kitchens as well as amenity space of the buildings.
Demand Operated Systems 	The control of the heating, cooling, ventilation, and lighting systems is fundamental to the energy efficiency of buildings. The use of the following measures can reduce energy consumption: Zoned thermostatic control; Time control; Variable flow control; BMS (Building Management System) automated control; Lighting PIR (Passive Infra-Red Sensor) control; Daylight linked lighting control; CO ₂ detection; and Energy management control	Y	Where ventilation, heating and cooling is provided to a space that may not always be in use, occupancy sensors will be used, this will be fundamental to the energy efficiency of each building. These will shut down the systems serving the spaces when they are not required and turn them back on instantly when they are required. The use of the following measures will be encouraged: Zoned thermostatic control; Time control; Variable flow control; BMS (Building Management System) automated control; Lighting PIR (Passive Infra-Red Sensor) control; Daylight linked lighting control; CO₂ detection; and Energy management control. The use of passive infra-red (PIR) for lighting, heating, ventilation will be adopted where feasible.
Variable Speed Drives 	Variable speed drives and controls allow an energy system to modulate during periods of low demand. Using variable speed drive pumps therefore uses less energy than traditional pumps, which run at a constant speed.	Y	All pumps and fans would be provided with variable speed motors which will speed up and slow down as the demand increases or reduces to conserve energy. These can be used in conjunction with the demand operated systems to reduce the speed of pumps and fan motors to a minimum to conserve energy. Variable speed drives can be adopted on all fan and pump motors where possible to reduce energy consumption (Central Plant).

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Power Management



Power management is a computing device feature that allows users to control the amount of electrical power consumed by an underlying device, with minimal impact on performance. It enables the switching of devices in various power modes, each with different power usage characteristics related to device performance.

P Power factor correction can be used on the electrical supplies of a building to improve energy efficiency.

This is not wholly suitable to the site.

LED Lighting



An LED lamp or LED light bulb is an electric light that produces light using light-emitting diodes. LED lamps are significantly more energy-efficient than equivalent incandescent lamps and can be significantly more efficient than most fluorescent lamps

Y Extensively adopted LED fittings will be used throughout the scheme to limit the energy associated with internal and external lighting.

LED lighting will be used throughout the development in areas with demand operated controls. Typically, this will be in the form of PIR sensors in small spaces and microwave sensors in larger areas.

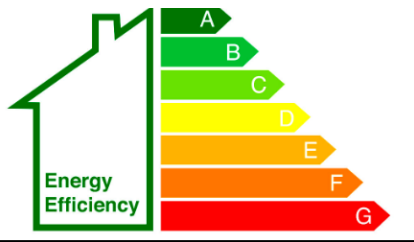
BMS Optimisation



A building management system is a computer-based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, and security systems.

Y The building may be provided with an intelligent building management system that will learn how the building operates and optimise the function of the ventilation, heating, and cooling systems to minimise energy use.

Low Energy Fit Out



A low energy fit out is an interior development of a building that is low carbon in its design, operation, and entire lifecycle.

Y All goods and appliances should be highly energy efficient to reduce energy demand.

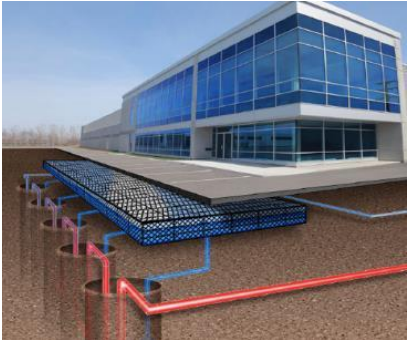
7.4. LZC Technology - (Be Green)

The following Low Zero Carbon (LZC) technologies have been identified and reviewed against their suitability on the Upper Brook Street, Manchester site:

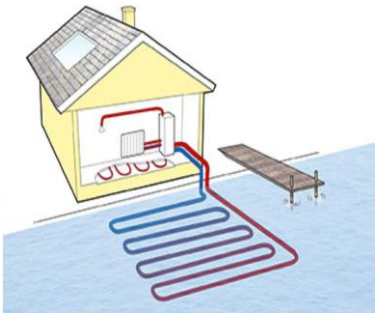
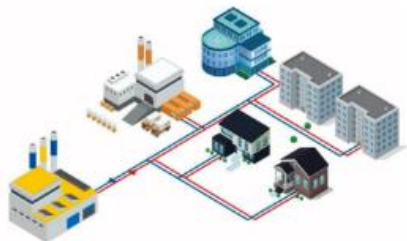
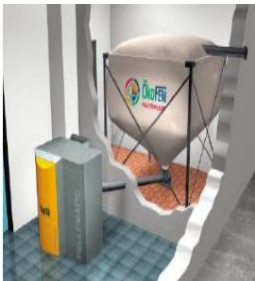
- Solar Water Heating
- Ground Source Heat Pumps
- Water Source Heat Pumps
- District Heating
- Biomass
- Wind Power
- Photovoltaic Electricity Generation
- Combined Heat and Power
- Air Source Heat Pumps
- Battery Storage

These services are described in more detail below and their suitability discussed.

- Key:**
- Y** – **Yes could be incorporated**
 - P** – **Possible**
 - N** – **Not appropriate**

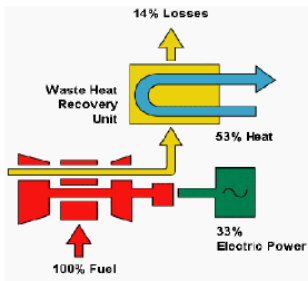
Technology	Description	Suitable For Consideration	Commentary
Solar Thermal Water Heating 	Solar thermal water heating systems use heat from the sun to pre-heat domestic hot water. Solar thermal water heating systems are generally composed of solar thermal collectors and a fluid system to move the heat from the collector to a storage tank to store the heat for subsequent use. The system requires solar panels on the roof, ideally south facing, linked to hot water storage cylinders.	N	In the case of multi-dwelling, multi-storey blocks the available roof area, pitch and orientation is critical. The solar energy collection and pipework distribution strategy would centre on collecting and storing thermal energy in cylinders or tanks in plant rooms. Solar thermal alone will not meet the scheme’s targets and would require large roof areas to make any meaningful contribution to the energy strategy. Additionally domestic hot water loads are relatively large given the development is residential based. The roof space on the scheme is limited which makes solar thermal an unfeasible option for generating hot water for the development,
Ground Source Heat Pumps 	Ground Source Heat Pumps (GSHP) can be used to extract heat from the ground by circulating a fluid through a system of pipes buried underground to a heat exchanger which transfers the energy to the distribution network. This can provide space heating and/or domestic hot water. Ground source heat pumps have the advantage that they can act as a source of both heating and cooling for the buildings. Ground source heat pumps are either open-loop (abstracting and rejecting water to the aquifer below the site) or closed-loop. aquifer below the site) or closed-loop using boreholes and energy piles.	N	Low grade heat generated, efficiency of system dependent on low distribution temperatures. Average Co-efficient of Performance (CoP) of around 4-6 meaning that for every unit of electricity used to pump the heat, 4-6 units of heat are produced, making this an efficient way of heating a building. Extensive underground boreholes/pipework difficult to install due to availability of land therefore discounted.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Water Source Heat Pumps 	Water Source Heat Pumps (WSHP) work in a similar way to GSHP, with the exception that the pipes are submerged into a river, stream, lake or the sea. The fluid is pumped through the system and absorbs energy from the surrounding water. WSHP can be either an open-loop or closed-loop system.	N	No suitable water courses nearby with enough volume.
District Heating 	Energy sources include heat from CHP and to a lesser extent, geothermal. Manchester City Council has a district heating scheme with the possibility of connection, however the feasibility and viability of connection to the district heating mains related to both the proximity of the network and the forecasted annual heat demand.	N	District heating generally provides low carbon emission factors and also reduces plant requirements within building. However, the distance of the proposed district heating mains to this development site is considered too far to be economically viable and are therefore discounted.
Biomass 	Biomass heating systems burn biomass material in a biomass boiler in order to heat water in the same way that gas boilers burn gas. Biomass materials include all land and water based vegetation, e.g. wood chips, wood pellets, wood waste and fast growing coppice trees such as willow. The carbon dioxide emitted from burning biomass is balanced by that absorbed during the fuel's production. Biomass heating therefore approaches a low carbon process. Biomass boilers require fuel storage for the fuel source.	N	Could be adopted to offset heating and hot water but high NO_x levels are a concern. Storage of fuel is an issue as this usually requires a large storage area, equivalent to the plant room size. Not considered for this site as is not in line with the decarbonisation of the grid.
Wind Power 	Wind power is one of the cleanest and safest methods of generating electricity. Wind turbines use the wind's forces to turn a rotor which in turn generates electricity. Wind power is used in large scale wind farms for national electrical grids as well as in small individual turbines or building integrated turbine.	N	Relatively high anticipated electricity demand for the building. Therefore, no potential issues with utilisation, i.e. availability will match demand. As the UK is one of the windiest countries in Europe, wind power is one of the best sources of renewable energy – dependent upon location. Wind power is unfeasible due to the fact the development is in an urban area and local wind conditions may not be sufficient to provide enough power.
Photovoltaic Electricity Generation 	Photovoltaic (PV) modules are devices or banks of devices that use the photovoltaic effect to generate electricity directly from sunlight. Until recently, their use has been limited due to high manufacturing costs. In buildings current applications include PV on the roof, PV curtain walling systems and PV louvred external shading devices. Typically, photovoltaics would be installed on a south facing roof.	P	Relatively high anticipated daytime electricity demand for the development. Therefore, no potential issues with utilisation, i.e. availability will match demand. The PV panels are used to generate electricity reducing CO₂ emissions. Capital cost of this system has dropped significantly in recent years. PV panels are considered viable to be installed on this development however the buildings have passed Part L Building regulations without the addition of PV and are therefore not included in this design, although, roof space has been identified for future provision.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Combined Heat and Power (CHP)



A CHP unit provides heating as well as electrical power. The electricity generated by the CHP plant can be distributed around a development and into the electrical network if needed. The use of this co-generation improves the overall efficiency of the primary energy delivered to the site with a corresponding reduction in the development’s CO₂ emissions.

The amount of thermal energy provided by the CHP unit will be dependent on the calculated thermal base load for the buildings.

N Relatively low cost of CHP unit if integrated into a gas boiler and domestic water cylinder strategy. High maintenance costs result in marginal returns on small to medium sized installations

Not considered as is not compatible with future de-carbonisation of the grid and reduction of use of fossil fuels

Air Source Heat Pump



Air source heat pumps work in a similar way to GSHPs but extract thermal energy from the surrounding air and transfer it into water. Air source heat pumps can be fitted on the façade or on the roof but care should be taken when mounting the units to avoid any acoustic problems associated with operating the fans as the outdoor units typically operate with sound levels in the range 55 - 60dB(A).

The efficiency of ASHP is measured by Coefficient of Performance (CoP); this is the ratio of units of heat output for each unit of electricity used to drive the system. Average CoP is around 2-4 although some systems may produce a greater rate of efficiency.

Y The ASHP system does offer an attractive solution in terms of the de-carbonisation of the grid and the omission of natural gas to the site.

This technology is feasible to generate hot water to blocks A1 and A2 and A3. However, the external façade of block A3 is subject to an external façade design review and may allow the space heating to be via electric panel heaters. The favoured space heating option for block A1 and A2 is also via electric panel heaters. VRV heat pumps will also provide heating and cooling to the amenity areas of the development.

7.5. District Heating Network

This section outlines how consideration of energy supplied efficiently from a district heating network can be provided to the dwellings in line with the Energy Hierarchy.

De-Centralised/ District Heating Networks (DHN)

The energy policy reaffirms the view that energy generated by centralised power stations and transmitted through the national grid is highly inefficient and wasteful. One of priorities for reducing CO₂ emissions is to reduce the city's reliance on centralised power stations.

This means increasing the use of local, low-carbon energy supplies through de- centralised energy systems.

Decentralised plant generally means any heating and hot water and/or electricity generation provided on a site or district wide basis. District heating is generally provided from Combined Heat and Power equipment (CHP). CHP is an engine which, when running, generates electricity and heats water which can then be distributed around a development.

Manchester City Council have been working in partnership with Vital Energi to create the Manchester Civic Quarter Heat Network. The below image identifies the current extent of the energy network.

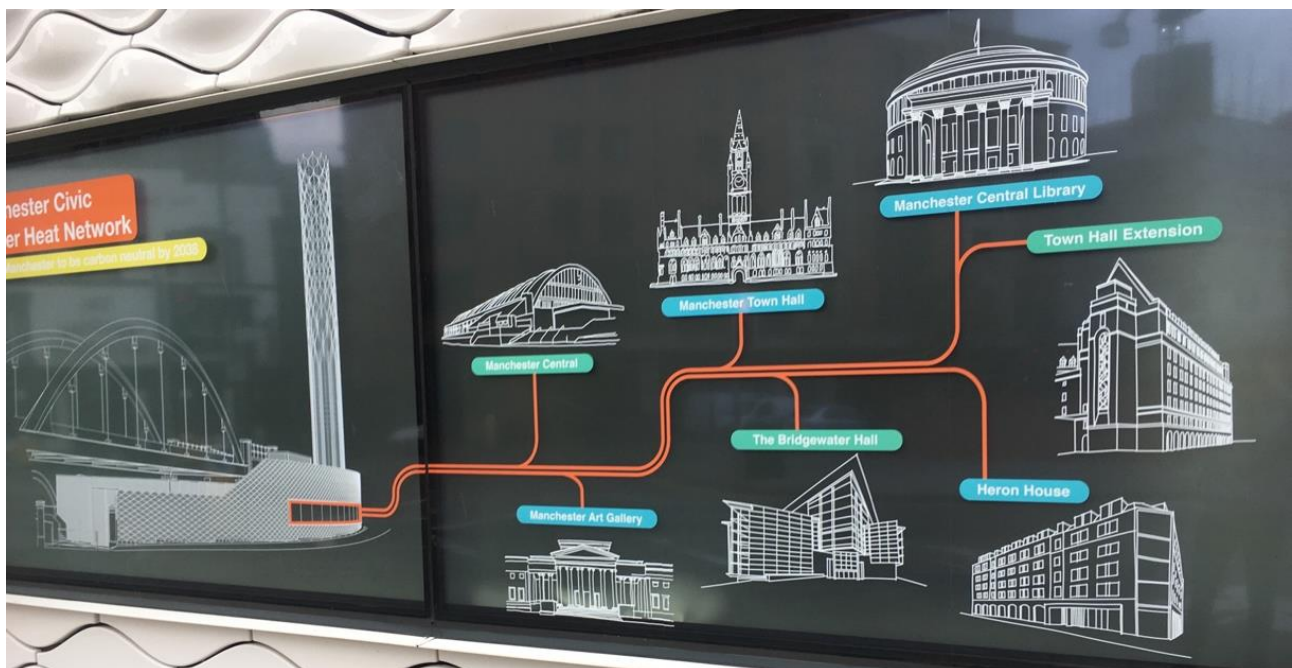


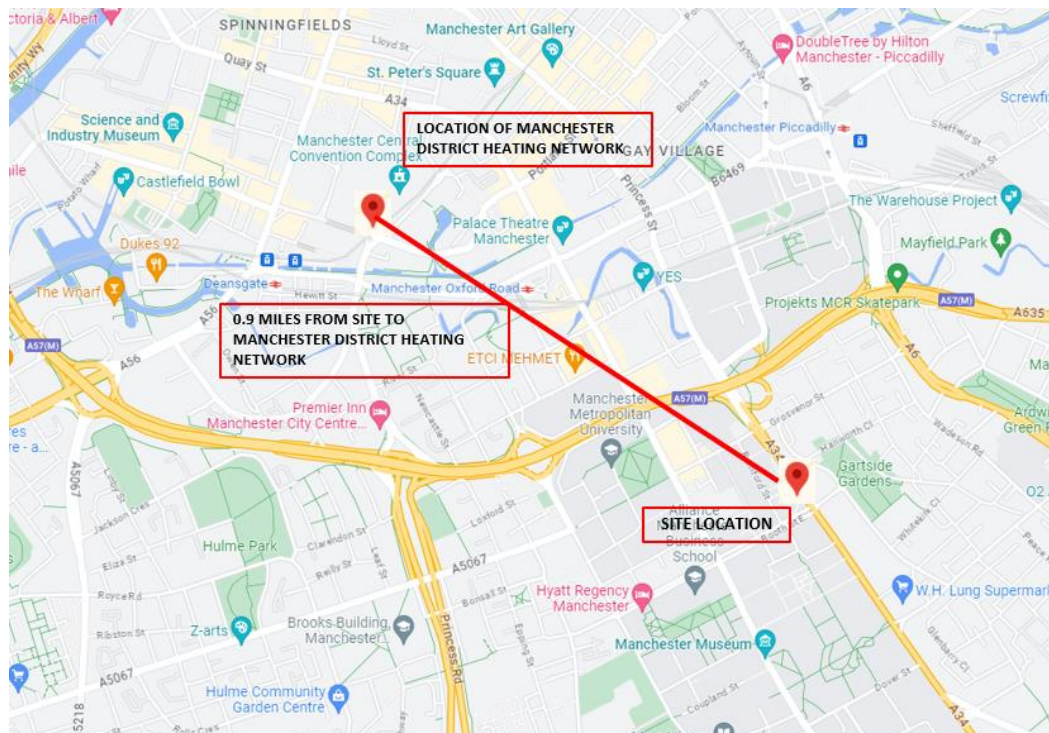
Figure 14 - Proposed Manchester Energy Network Route

The network will provide heat and power solution for a number of buildings, making significant carbon reductions.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

The buildings currently connected are:

- Manchester Town Hall
- Manchester Town Hall Extension
- Manchester Central Library
- Manchester Central Convention Centre
- The Bridgewater Hall
- Heron House
- Manchester Art Gallery



The network contains power cables to distribute the electricity generated and underground pipes that deliver heat and hot water to connected buildings. The network has been designed to enable future expansion, with efficiency and carbon savings increasing as more buildings join.

Heat is generated from an energy centre, which is situated near to Manchester Central Convention Centre, at the junction of Great Bridgewater Street and Lower Mosley Street. The distance of the proposed district heating mains to this development site are considered too far to be economically viable and are therefore discounted.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

8. PROPOSALS

Energy modelling has been carried out to reflect the RIBA planning stage, stage 2 design. The modelling has been based on:

- SAP Calculations – Block A1 and A2 for residential
- SBEM – Amenity areas and residential areas to block A3

The Block A3 is a cluster arrangement and hence considered more suitable to be assessed under SBEM calculations and not SAP's and the calculations reflect this.

The following BRUKL and SAP results relate to a RIBA Stage 2 design and will be subject to a design development due to the next stages. The results produced are run using the new Part L 2021 Building Regulations.

The following software's have been adopted for each of the different categories:

- SBEM – IES VE
- SAP's – Elmhurst Energy

8.1. Passive Measures – Lean

In the first instance, the team have maximised passive measures to reduce the initial load of the building in terms of thermal heating and artificial lighting loads with the following measures: -

8.1.1 Target Building Fabric U-Values

Student Residential Block A1 and A2

Building Fabric Element	Limiting U-Value (w/m ² K)	Target U-Value (w/m ² K)	% Betterment
Windows	1.6	1.16	37%

Student Residential Block A3

Building Fabric Element	Limiting U-Value (w/m ² K)	Target U-Value (w/m ² K)	% Betterment
Windows	1.6	0.8	50%

Student Residential Block A1 and A2 Amenity Areas

Building Fabric Element	Limiting U-Value (w/m ² K)	Target U-Value (w/m ² K)	% Betterment
Walls	0.26	0.15	42%
Floors	0.18	0.15	17%
Flat Roofs	0.18	0.15	17%
Windows	1.6	1.6	0%

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

8.1.2 Target Air Permeability

Student Residential Block A1 and A2

Air Permeability	Limiting Air Permeability	Target Air Permeability for Upper Brook Street	% Betterment
M ₃ /(h.m ₂) at 50 Pa	8	3	62.5%

Student Residential Block A3

Air Permeability	Limiting Air Permeability	Target Air Permeability for Upper Brook Street	% Betterment
M ₃ /(h.m ₂) at 50 Pa	8	3	62.5%

Amenity Areas

Air Permeability	Limiting Air Permeability	Target Air Permeability for Upper Brook Street	% Betterment
M ₃ /(h.m ₂) at 50 Pa	8	3	62.5%

- Glazing that limits the amount of unwanted solar gain will be used to avoid habitable rooms from overheating with G-Values of 0.4.

Designing the proposed development with U-values and Air Permeability that are lower than the minimum Building Regulations values is essential to reducing the initial demand for energy in the building from the outset using passive measures. For the proposed development, U-Values and Air Permeability that exceeds Building Regulations have been used which will result in less energy required to maintain comfortable conditions inside the buildings as well as the buildings performing better as an insulator.

Passive design measures will allow the proposed development to maximise the use of natural sources of cooling and ventilation to maintain comfortable conditions within the internal spaces and will also allow the heating systems of the residential blocks to perform more efficiency.

Utilising these passive measures will consequently reduce energy consumption and CO₂ emissions of the proposed development as less energy will be required for the space heating and space cooling requirements.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET



Figure 15 - Facade Detail – Main Entrance Block A1 and A2



Figure 16 - Facade Detail – Main Entrance Block A3

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

The proposed development will adapt the use of perforated opening panels to facilitate purge ventilation coupled with Mechanical Ventilation Heat Recovery (MVHR) with summer-by-pass and this mitigates the need for artificial cooling in the residential areas. The panels are designed to be utilised for peak summer conditions with rapid ventilation with the MVHR utilised for general background ventilation. An example of perforated opening panels is shown in figure 15.

Perforated Opening
Panel



Figure 17 - Perforated Ventilation Opening Panels

8.2. Energy Efficiency Measures – Mean

The next stage of the design development was to establish energy efficiency measures to meet the demand of the Student Residential Blocks A1, A2 and A3 and the Amenity areas of the development, these being: -

8.2.1 Mechanical Ventilation Heat Recovery

Ventilation with heat recovery is a mechanical system that ensures there is minimal heat loss when ventilating

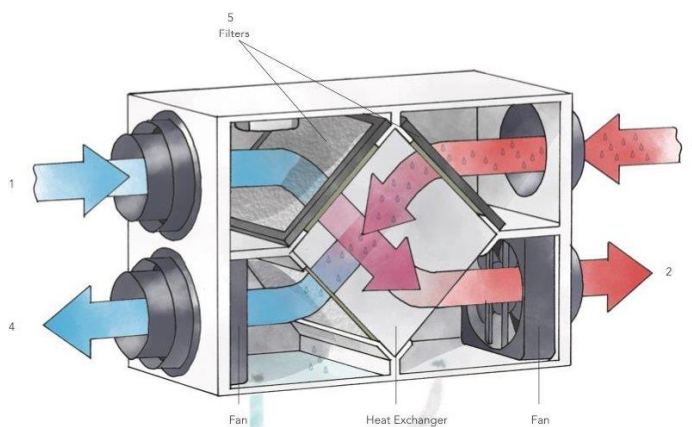


Figure 18 - Typical MVHR configuration

a room. The system/units work by extracting the stale air inside the building and feeding it through filters whilst also extracting the heat energy so that it's not exhausted to the outside but transferred back into the building with the filtered incoming air. The main components of MVHR units are; a heat recovery cell (where the indoor heat is extracted and supplied into the outside air coming into the building), fans (pull in the air and blow out the air), and filters (filtering outside air from dust and particles inside the unit, protecting longevity and efficiency). Alongside this, units come with a summer bypass, meaning they can

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

control the amount of energy recovered this is controlled either manually or by an electronic sensor. Benefits of MVHR units include, filtered air, minimal heat losses, mitigates overheating, and retains heat that would usually be exhausted to the outside environment.

Heat recovery to the mechanical ventilation systems, will be adopted as illustrated in figure 16 below. These units will provide fresh air and heat recovery to the individual bedrooms of the development as well as the cluster kitchens and the amenity spaces. This reduces any required cooling load which can significantly reduce the CO₂ emissions of the proposed development and will also assist in providing comfortable living conditions.

Summer bypass mode will be used on the units during the summer periods which will reject heat instead of recovering. This will be used to avoid summer time overheating as during the warmer months of the year, heat recovery will not be required in the habitable spaces.

Appendix 1 shows the ventilation strategy drawings that have been adopted for the bedrooms, studios and cluster kitchens of the development.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

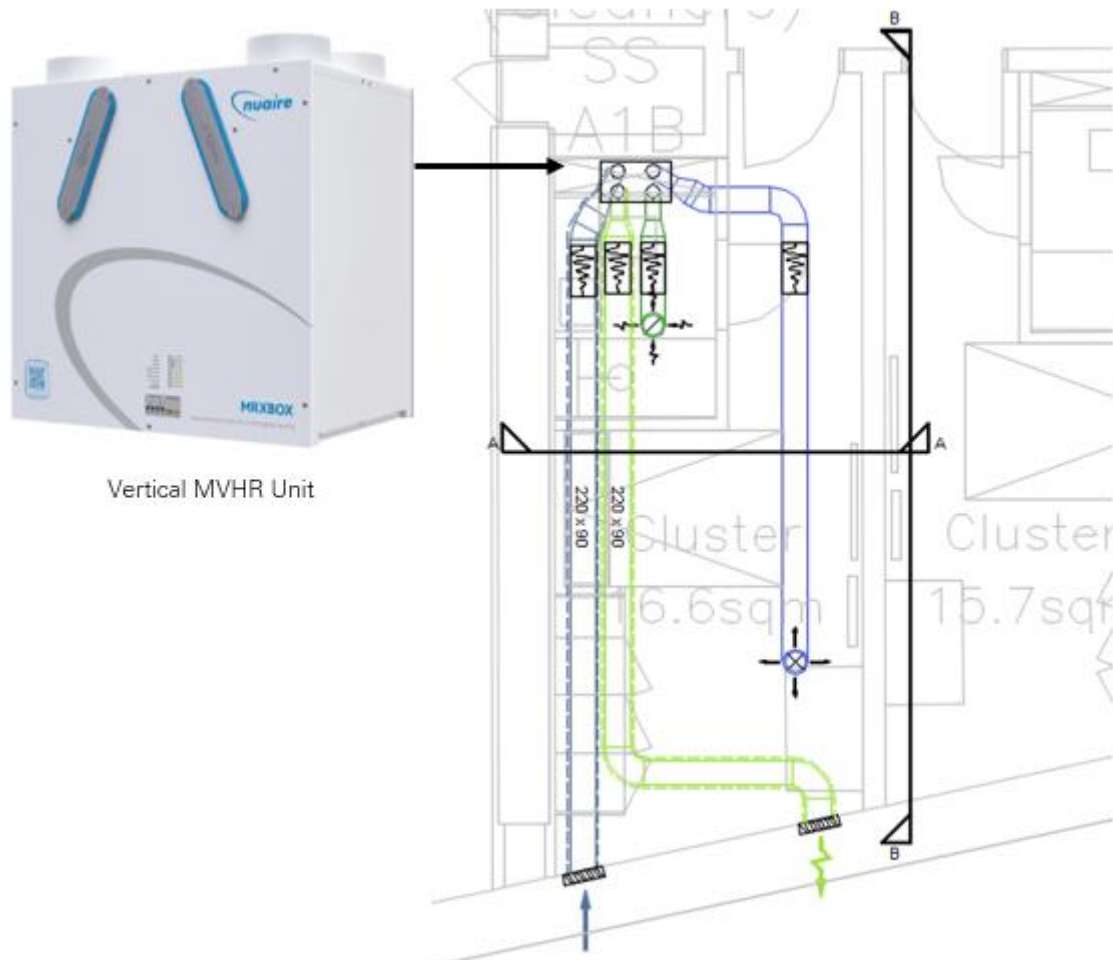


Figure 19 – Typical Bedroom Vertical MVHR layout - Option 1A

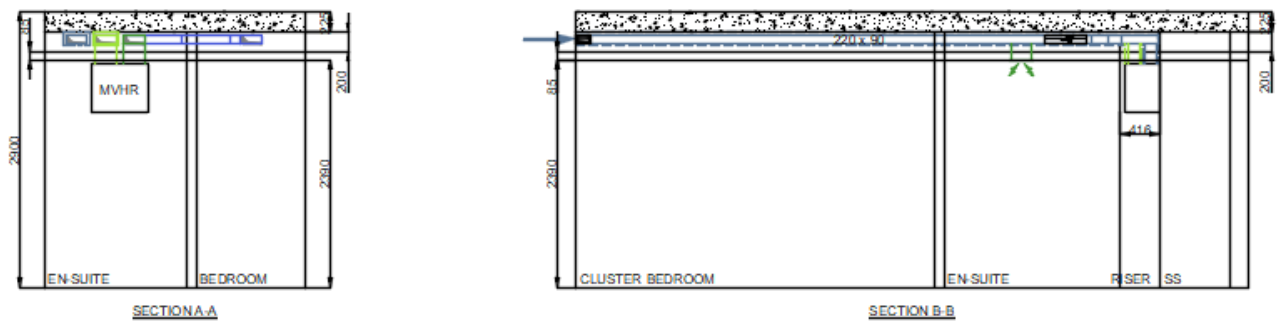


Figure 20 – Sections of Typical Bedroom Vertical MVHR layout - Option 1A

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

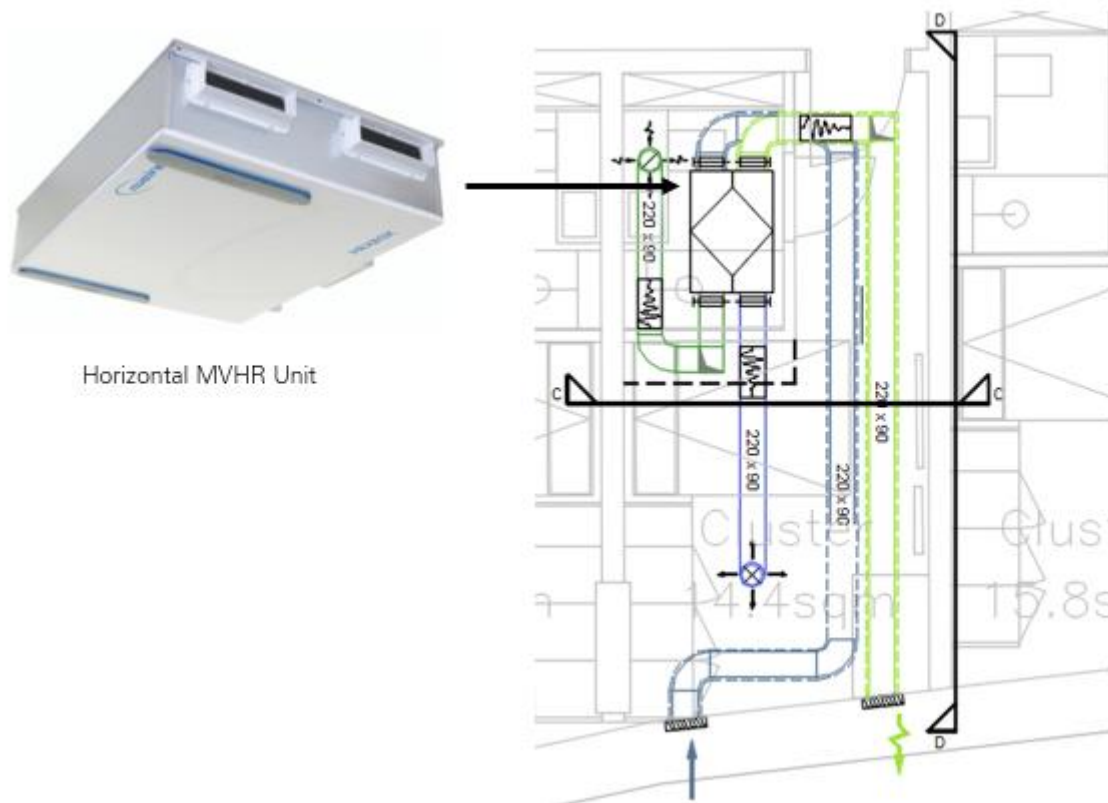


Figure 21 – Typical Bedroom Horizontal MVHR layout - Option 1B

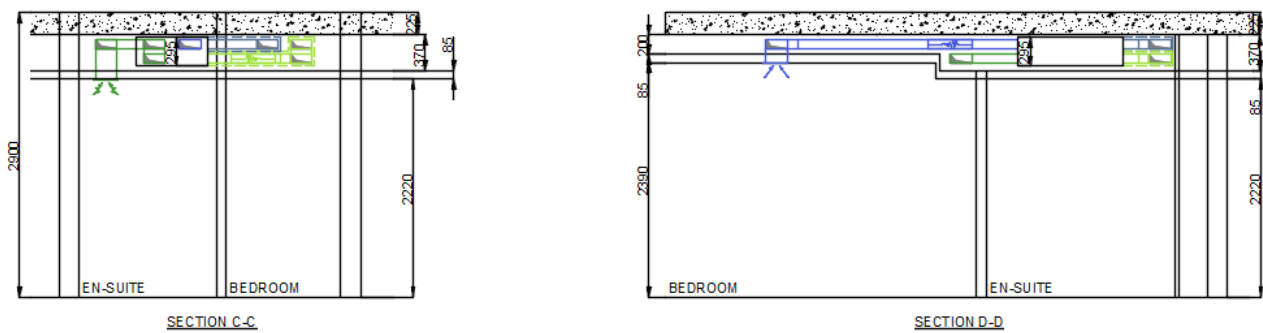


Figure 22 – Sections of Typical Bedroom Horizontal MVHR layout - Option 1B

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

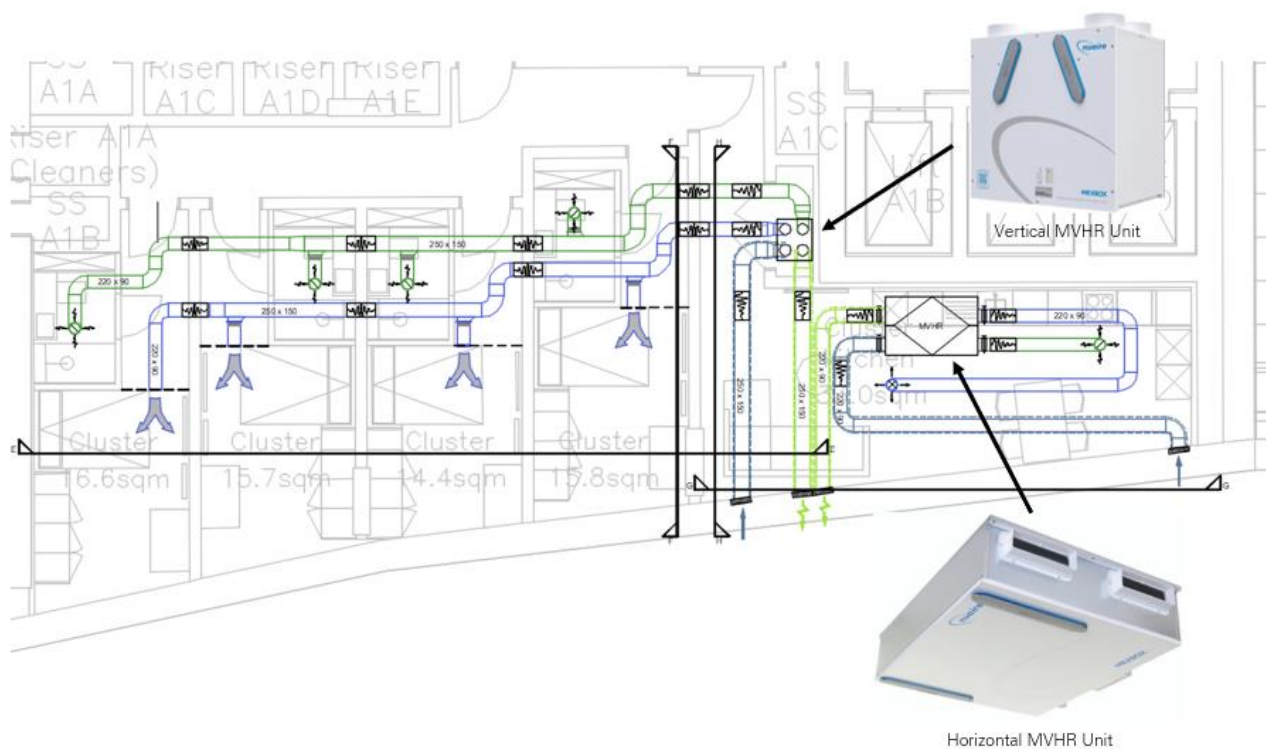


Figure 23 – Typical Horizontal and Vertical MVHR Layout Option 2A – 1 Horizontal MVHR Unit Serving Cluster Kitchen and 1 Vertical MVHR Unit Serving Cluster Bedrooms

Vertical MVHR Unit Serving Cluster Bedrooms with Horizontal MVHR Unit in Cluster Kitchen Ceiling Void to Serve Cluster Kitchen	
Pro's	Con's
1no. mvhr unit per bedroom cluster	DW 144 standard ductwork (higher cost)
Less maintenance than option 1	Cost of cross talk attenuators
Improved access to option 1	No local control
Louvres not required in bedrooms in clusters	Cupboard space reduced in kitchen
	Bulkhead required in lobby of bedrooms
	Increase louvre sizes in kitchen area
	More balancing / commissioning required than option 1

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

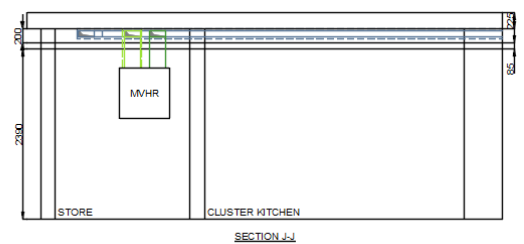
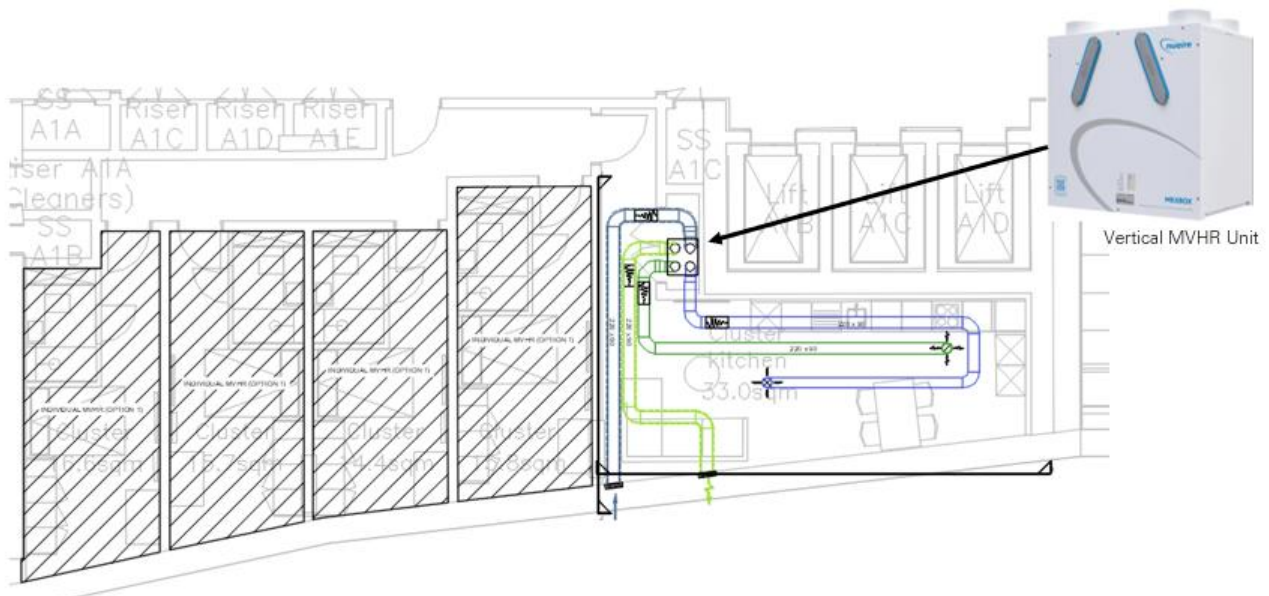


Figure 25 – Sections of Typical Vertical MVHR Layout Option 2B – Individual MVHR Unit Serving Cluster Kitchen

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

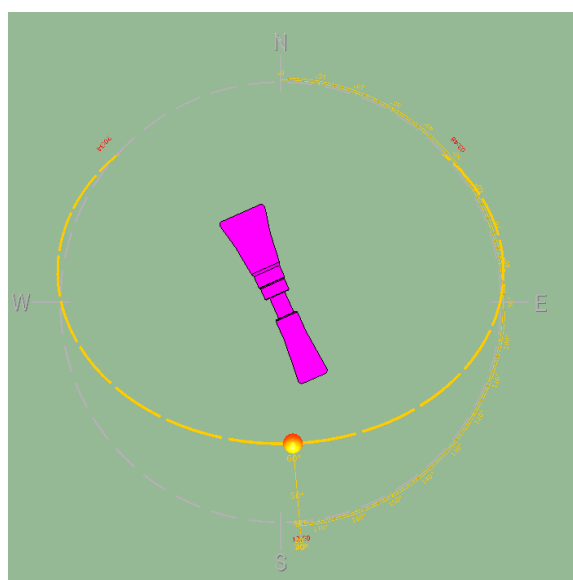
As part of this ventilation strategy an overheating analysis has been carried out for the proposed development to show compliance with the thermal comfort criteria as set out in Approved Document Part O Overheating of the Building Regulations for the residential element.

Based on the modelling conducted, the results show that all habitable rooms for the sample apartments and the kitchen / living spaces comply with the thermal comfort criteria as set out by Approved Document Part O Overheating.

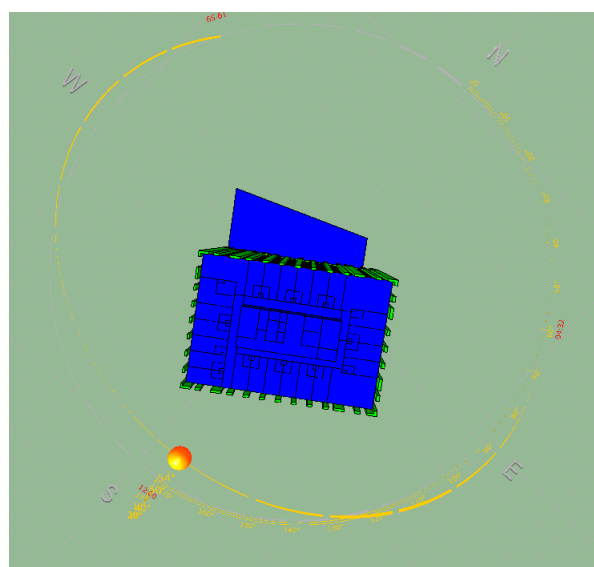
The proposed building design utilises a summer bypass mechanical ventilation heat recovery (MVHR) system. The MVHR system will operate if the room air temperature is greater than 21degC and the outside air temperature is less than the room air temperature.

The opening panels do have a variable window restrictor (up to 90°C) and are open only from 7am – 11pm. The window opening strategy is as per Approved Document Part O:

- i. Start to open when the internal temperature exceeds 22°C.
- ii. Be fully open when the internal temperature exceeds 26°C.
- iii. Start to close when the internal temperature falls below 26°C.
- iv. Be fully closed when the internal temperature falls below 22°C



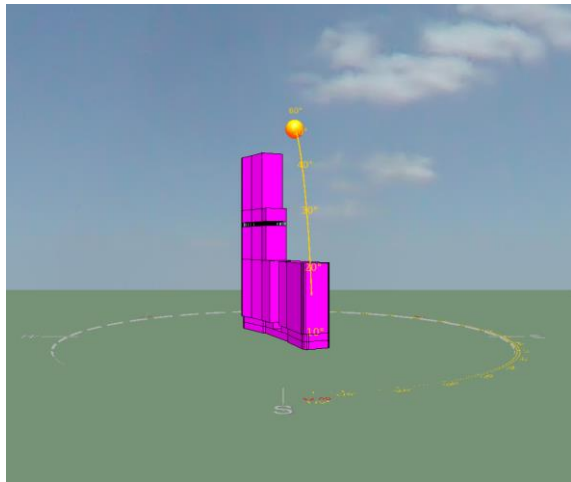
Block A1



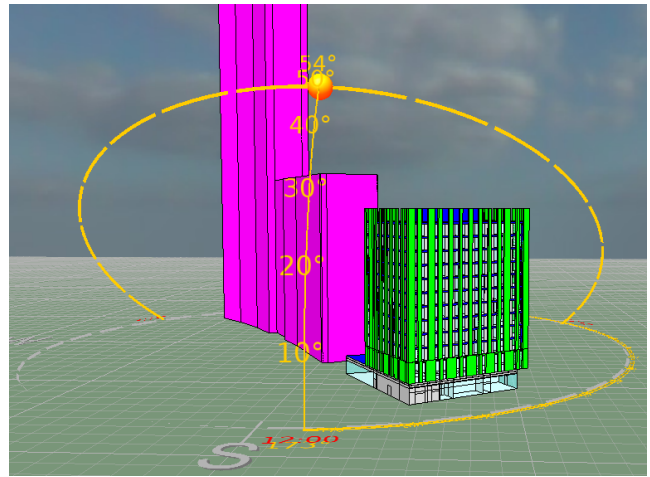
Block A3

Figure 26 – Image showing plan view of thermal model

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

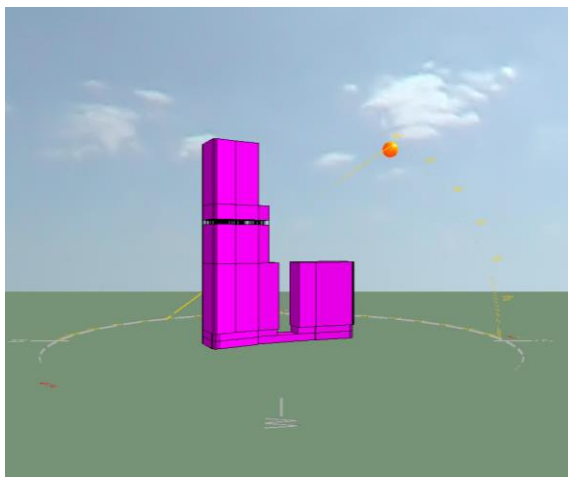


Block A1

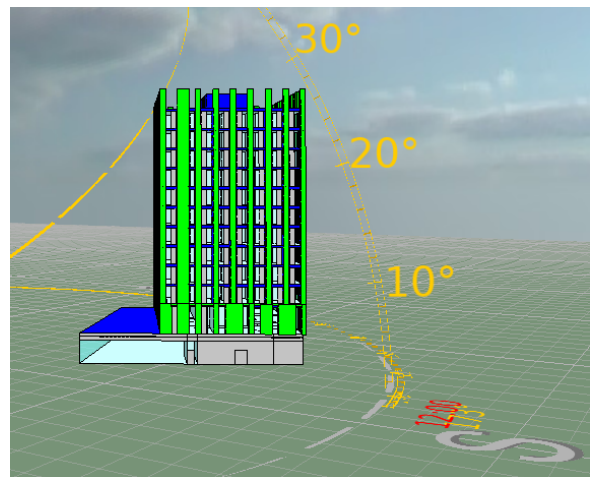


Block A3

Figure 27 – Image showing South Face of thermal model



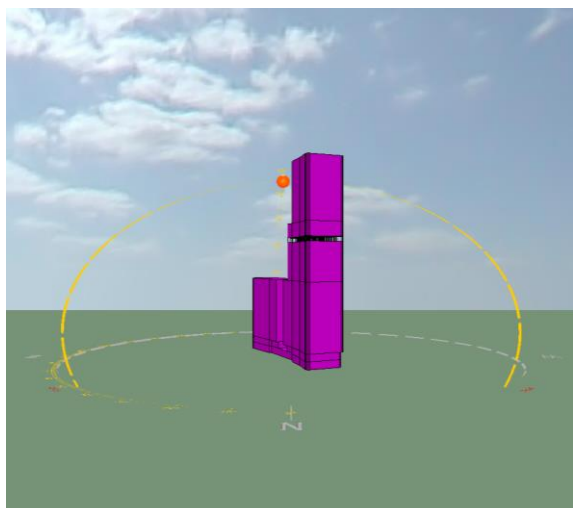
Block A1



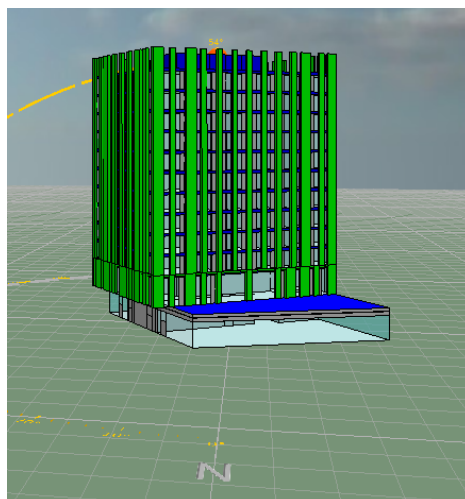
Block A3

Figure 28 – Image showing West Face of thermal model

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

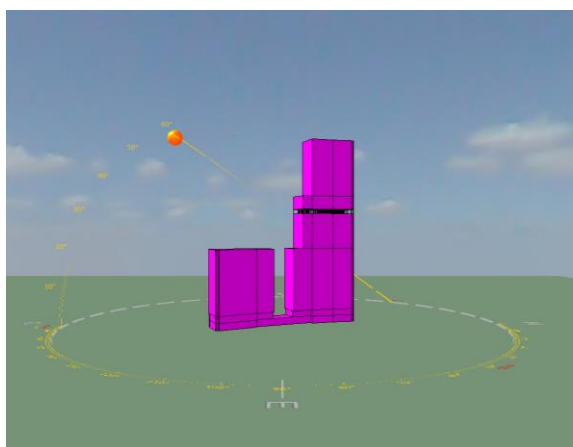


Block A1

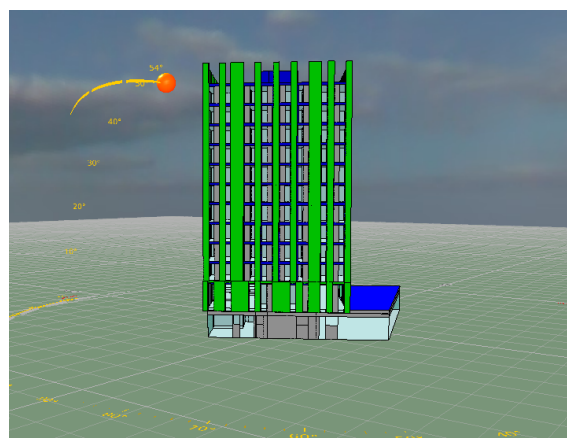


Block A3

Figure 29 - Image showing North Face of thermal model



Block A1



Block A3

Figure 30 –Image showing East Face of thermal model

This modelling demonstrates that natural ventilation via openable panels will be sufficient to providing a high percentage of the building's ventilation needs to avoid overheating meaning that less energy is required for mechanical ventilation and artificial cooling. Using natural ventilation can result in significant CO₂ savings for the proposed development.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

The tables below show the predicted thermal comfort results against the mechanical ventilation criteria for each of the assessed rooms within the proposed development using the Manchester CIBSE DSY 1 2020's high emissions 50th percentile range weather file.

Block A1

ROOM NAME	OCCUPIED HOURS	NO. HOURS > 26°C	% ANNUAL HOURS > 26°C	PASS/FAIL
Accessible Cluster Bedroom	3672	0	0.0	Pass
Accessible Studio	3672	23	0.3	Pass
Cluster Bedroom 001	3672	0	0.0	Pass
Cluster Bedroom 002	3672	0	0.0	Pass
Cluster Bedroom 003	3672	0	0.0	Pass
Cluster Bedroom 004	3672	0	0.0	Pass
Cluster Bedroom 005	3672	0	0.0	Pass
Cluster Bedroom 006	3672	0	0.0	Pass
Cluster Bedroom 007	3672	0	0.0	Pass
Cluster Kitchen 001	1989	22	0.5	Pass
Cluster Kitchen 002	1989	67	1.4	Pass
Large Studio 001	3672	0	0.0	Pass
Large Studio 002	3672	0	0.0	Pass
Standard Studio 001	3672	0	0.0	Pass
Standard Studio 002	3672	99	1.1	Pass
Standard Studio 003	3672	0	0.0	Pass
Standard Studio 004	3672	0	0.0	Pass
Standard Studio 005	3672	4	0.0	Pass
Standard Studio 006	3672	4	0.0	Pass

Based on the modelling conducted, the results show that all habitable rooms for the sample apartments in Block A1 comply with the thermal comfort criteria as set out by Approved Document Part O 'Overheating'.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Block A3

ROOM NAME	OCCUPIED HOURS	NO. HOURS > 26°C	% ANNUAL HOURS > 26°C	PASS/FAIL
Bedroom 001	3672	0	0.0	Pass
Bedroom 002	3672	0	0.0	Pass
Bedroom 003	3672	0	0.0	Pass
Bedroom 004	3672	0	0.0	Pass
Bedroom 005	3672	0	0.0	Pass
Bedroom 006	3672	0	0.0	Pass
Bedroom 007	3672	0	0.0	Pass
Bedroom 008	3672	0	0.0	Pass
Bedroom 009	3672	0	0.0	Pass
Bedroom 010	3672	0	0.0	Pass
Bedroom 011	3672	0	0.0	Pass
Bedroom 012	3672	0	0.0	Pass
Bedroom 013	3672	0	0.0	Pass
Bedroom 014	3672	0	0.0	Pass
Bedroom 015	3672	0	0.0	Pass
Bedroom 016	3672	0	0.0	Pass
Bedroom 017	3672	0	0.0	Pass
Bedroom 018	3672	0	0.0	Pass
Bedroom 019	3672	0	0.0	Pass
Bedroom 020	3672	0	0.0	Pass
Bedroom 021	3672	0	0.0	Pass
6 Person Kitchen/ Living	1989	0	0.0	Pass
7 Person Kitchen/ Living	1989	15	0.3	Pass
8 Person Kitchen/ Living	1989	7	0.1	Pass

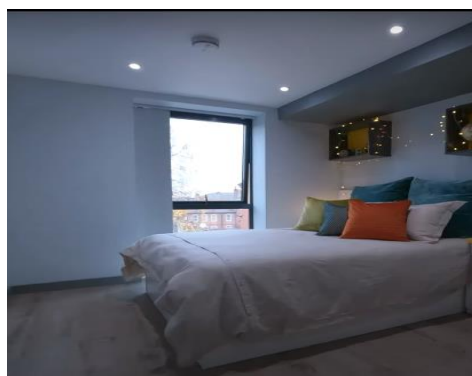
ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Based on the modelling conducted, the results show that all habitable rooms for the sample apartments in Block A3 comply with the thermal comfort criteria as set out by Approved Document Part O 'Overheating'.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

8.3. Further Energy Efficiency Measures

- Low specific fan power (SFP's) ratings in the region of 0.9 W/(l/s) and below, to ventilation fans which will reduce the energy consumption of the proposed developments ventilation system.
- High efficiency LED lighting throughout coupled with demand operated lighting where appropriate via daylight dimming, absence detection which turns lights off when there is no occupancy detected. This reduces energy consumption and CO₂ emissions associated with lighting in the proposed development.



- Demand operated controls which control the operation of systems only when required such as:
 - Dedicated time and control temperature control systems to
 - Electric panel heaters (Block A1 and A2)
 - Absence detection on lighting in corridors and bedrooms
 - Daylight dimming of lighting in amenity spaces
 - Point of use electric water heaters to serve the hot water demand on the 29th floor amenity areas
- MVHR units with common extract CO₂ detection to boost MVHR rates
- Variable speed operation of MVHR units to residential spaces
- BMS operation of amenity spaces building services systems



8.4. Renewable and Low Carbon Technologies – Green

The final aspect of the design has been to establish what renewable and low carbon technologies can be adopted.

Following the appraisal of the building and site, Air Source Heat Pumps will be used to generate hot water for the proposed development with electric panel heaters providing space heating for block A1 and A2. The external façade design for block A3 is subject to a design review and when concluded, this may allow for space heating of block A3 to be provided via electric panel heaters.



The rooftop ASHP's will be located in external compounds with a dedicated low temperature heating circuits serving hot water calorifiers in plant rooms across each block.

The average CoP of air source heat pumps is around 2-4 although some systems may produce a greater rate of efficiency. This means that for every kW of electric power the

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

heat pumps use, 2-4 kW of heat energy is generated, this results in reduced carbon emissions and operational energy. Drawing layouts for the Air Source Heat Pump (ASHP) locations are shown in Appendix 1

Variable Refrigerant Volume (VRV) reverse cycle heat pumps with energy sharing will also provide heating and cooling in the amenity areas of the development. Drawing layouts for the VRV condenser's locations are shown on drawings in Appendix 1. The roof top condenser will serve indoor fan coil units in a VRV refrigerant system typically providing CoPs in the region of 3-4 depending on the season and internal loads.

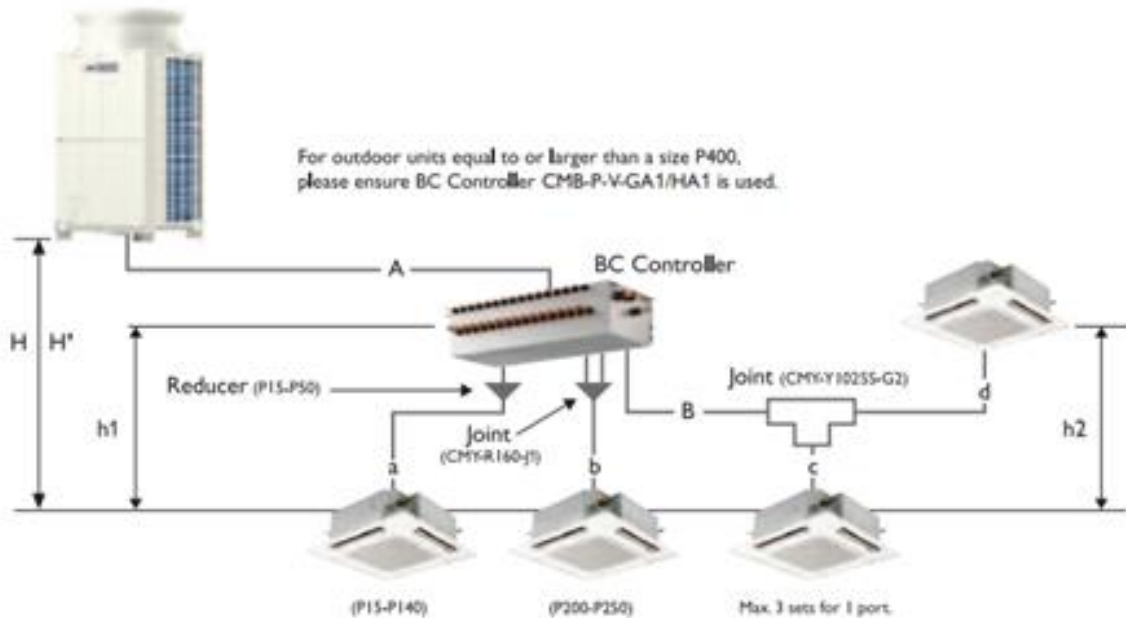


Figure 31 – VRV schematic

The fan coil units will provide the form of heating and cooling in the rooms and also work in conjunction with local MVHR units



Figure 32 – Typical VRV Fan Coil to Amenity Spaces



Figure 33 – Typical MVHR Units to Amenity Spaces

The development has passed the Part L buildings Regulations without the addition of Photovoltaic Panels therefore they have not been included in this stage of the design, however, to future proof the development,

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

space for future provision of photovoltaic panels has been identified on the roofs of Block A1, A2 and A3 which can assist in offsetting some of the buildings electrical demand if installed.



Figure 34 - Roof Mounted Photovoltaic Panels

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

8.5. Carbon Emissions and Operational Energy Savings

The following SAP and BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development at the next stages. The SAP and BRUKL results are shown in Appendix 2.

8.5.1 Block A1 and A2 (SAP Results)

Target dwelling CO ₂ emission rate (TER), kgCO ₂ /m ² .	25.23	
Dwelling CO ₂ emission rate (BER), kgCO ₂ /m ²	8.91	
Dwelling primary energy rate (TPER), kgCO ₂ /m ² .	140.35	
Target primary energy rate (BPER), kgCO ₂ /m ²	96.03	
Dwelling Fabric Energy Efficiency kgCO ₂ /m ²	24.36	
Target Fabric Energy Efficiency kgCO ₂ /m ²	26.44	
Do the buildings emission and primary energy rates exceed the targets?	BER=<TER	BPER=<TPER

The proposed option provides a 64.88% improvement on the target CO₂ emission rate and a 31.57% improvement on the target primary energy rate. The dwelling fabric energy efficiency is also at a 7.88% betterment over the target fabric energy efficiency.

8.5.2 Block A1 and A2 Amenity Areas (BRUKL Results)

The following SAP and BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development at the next stages. The SAP and BRUKL results are shown in Appendix 2.

In summary, the building emission rate is lower than the target emissions rate and the building primary energy rate is lower than the target primary energy rate.

Target CO2 emission rate (TER), kgCO ₂ /m ² . annum	5.46	
Building CO2 emission rate (BER), kgCO ₂ /m ² . annum	5.07	
Target primary energy rate (TPER), kWh/m ² .	59.31	
Building primary energy rate (BPER), kWh/m ² /yr	55.08	
Do the buildings emission and primary energy rates exceed the targets?	BER=<TER	BPER=<TPER

The proposed option provides a 7.14% betterment on the target CO₂ emission rate.

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

8.5.3 Block A3 (BRUKL Results)

The following SAP and BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development at the next stages. The SAP and BRUKL results are shown in Appendix 2.

In summary, the building emission rate is lower than the target emissions rate and the building primary energy rate is lower than the target primary energy rate.

Target CO2 emission rate (TER), kgCO2/m2. annum	3.98
Building CO2 emission rate (BER), kgCO2/m2. annum	3.9
Target primary energy rate (TPER), kWh/m ² .	42.68
Building primary energy rate (BPER), kWh/m2/yr	41.91
Do the buildings emission and primary energy rates exceed the targets?	BER=<TER BPER=<TPER

The proposed option provides a 2% betterment on the target CO₂ emission rate.

9. OVERALL SUMMARY

The following SAP and BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development at the next stages. The SAP and BRUKL results are shown in Appendix 2.

This report has discussed the energy strategy for the Upper Brook Street Development in Manchester. It has reviewed and proposed low and zero carbon technologies and presented the results from initial SAP (Block A1 and A2) and SBEM (Block A3) assessments.

The proposed energy strategy option for Block A1 and A2 using the SAP energy modelling methodology, provides a 64.88% improvement on the target CO₂ emission rate and a 31.57% improvement on the target primary energy rate. The dwelling fabric energy efficiency is also at a 7.88% betterment over the target fabric energy efficiency.

The Part L 2021 regulations generally require a 31% and 27% reduction over Part L 2013 CO₂ emissions targets for domestic buildings and Part L 2013 implemented an improvement of 9% over Building Regs Part L 2010 targets.

Accumulatively, the building regulations have forced roughly 36% improvement over the notional targets since 2010. SBEM energy modelling methodology has been undertaken for Block A3 of the Upper Brook Street development, which improves on the 2021 Part L regulations by circa 2% as such the scheme is at a circa 38% betterment over the 2010 Part L Building Regulations.

SBEM energy modelling methodology has been undertaken for the amenity areas of Block A1 and A2 of the Upper Brook Street development, which improves on the 2021 Part L regulations by circa 7.14 % as such the scheme is at a circa 43.14% betterment over the 2010 Part L Building Regulations.

Our strategy has sought to reduce the carbon emissions for the building using a lean, mean green approach and these findings have been applied to the building.

The proposals presented also support the governments and local authorities' policy on phasing out fossil fuels and as the grid decarbonises further and will offer more carbon reduction towards net zero carbon.

Block A1 and A2 Ventilation Layout



Block A1 and A2 Roof Top Plant VRV Locations & Air Source Heat Pump Locations



Block A3 VRV & Air Source Heat Pump Locations



ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

11. APPENDIX 2

SAP Calculations Block A1 and A2

The following SAP results relate to a RIBA stage 2 design and will be subject to a design development due to the next stages. The results produced are run using the new Part L 2021 Building Regulations.

Block Compliance



Block Reference

N0196 - Upper Brook Street REV

Issued on Date

05/04/2023

Block Name

Calculation Type

New Build (As Designed)

Assessor Details

Mr. Charlie Ball

Assessor ID

AW73-0001

Client

Ridge, Ridge, Work, England, England

Block Compliance Report - DER

Block Reference: N0196 - Upper Brook Street REV

Block Name:

Property-Assessment Reference	Floor area (m ²)	DER (kgCO ₂ /m ²)	TER (kgCO ₂ /m ²)	% DER/TER
N0196 UBS Studio 14.1 - Studio 14.1_Copy	19.90	4.74	25.23	81.21 %
N0196 UBS Studio 14.10 - Studio 14.10_Copy	19.90	9.76	25.05	61.04 %
N0196 UBS Studio 14.11 - Studio 14.11_Copy	24.14	8.47	22.73	62.74 %
N0196 UBS Studio 14.12 - Studio 14.12_Copy	24.14	8.38	22.62	62.95 %
N0196 UBS Studio 14.2 - Studio 14.2_Copy	19.90	9.84	25.62	61.59 %
N0196 UBS Studio 14.3 - Studio 14.3_Copy	19.90	9.84	25.62	61.59 %
N0196 UBS Studio 14.4 - Studio 14.4_Copy	19.90	5.27	27.56	80.88 %
N0196 UBS Studio 14.5 - Studio 14.5_Copy	19.90	10.00	27.53	63.68 %
N0196 UBS Studio 14.6 - Studio 14.6_Copy	19.90	9.83	25.23	61.04 %
N0196 UBS Studio 14.7 - Studio 14.7_Copy	19.90	9.83	25.40	61.30 %
N0196 UBS Studio 14.8 - Studio 14.8_Copy	19.90	9.83	25.39	61.26 %
N0196 UBS Studio 14.9 - Studio 14.9_Copy	20.70	10.71	27.23	60.67 %
N0196 UBS Studio 27.1 - Studio 27.1_Copy	19.90	4.72	25.04	81.15 %
N0196 UBS Studio 27.2 - Studio 27.2_Copy	19.90	10.00	27.87	64.12 %
N0196 UBS Studio 27.3 - Studio 27.3_Copy	19.90	9.84	26.83	63.05 %
N0196 UBS Studio 27.4 - Studio 27.4_Copy	19.90	9.82	25.07	60.83 %
N0196 UBS Studio 27.5 - Studio 27.5_Copy	20.70	10.78	26.89	59.91 %
N0196 UBS Studio 27.6 - Studio 27.6_Copy	19.90	9.82	25.63	61.69 %
N0196 UBS Studio 27.7 - Studio 27.7_Copy	24.14	8.39	22.56	62.81 %
N0196 UBS Studio 27.8 - Studio 27.8_Copy	24.14	8.39	22.56	62.81 %
N0196 UBS Studio 28.1 copy - Studio 28.1 Rev A	19.90	4.72	25.04	81.15 %
N0196 UBS Studio 28.2 Rev A - Studio 28.2	19.90	10.00	27.87	64.12 %

SAP 10 Online 2.5.18

Page 1 of 1

SAP 10 Online 2.5.18

Page 1 of 4

Block Compliance



N0196 UBS Studio 28.3 Rev A - Studio 28.3_Copy	19.90	9.84	26.83	83.05 %
N0196 UBS Studio 28.4 Rev A - Studio 28.4	19.90	9.82	25.07	60.83 %
N0196 UBS Studio 28.5 Rev A - Studio 28.5	20.70	10.78	26.89	59.91 %
N0196 UBS Studio 28.6 Rev A - Studio 28.6	19.90	9.82	25.63	61.69 %
N0196 UBS Studio 28.7 Rev A - Studio 28.7	24.14	8.39	22.56	62.81 %
N0196 UBS Studio 28.8 Rev A - Studio 28.8	24.14	8.39	22.56	62.81 %
Totals:	585.04	250.02	709.71	
Average DER = 8.81 kgCO ₂ /m ²	% DER/TER		PASS	
Average TER = 25.23 kgCO ₂ /m ²	64.68 %			

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Block Compliance Report - DFEE				
Block Reference: N0196 - Upper Brook Street REV		Block Name:		
Property-Assessment Reference	Floor area (m ²)	DFEE kWh/m ² /yr	TFEE kWh/m ² /yr	% DFEE/TFEE
N0196 UBS Studio 14.1 - Studio 14.1_Copy	19.90	19.58	24.39	19.72 %
N0196 UBS Studio 14.10 - Studio 14.10_Copy	19.90	15.29	19.74	22.51 %
N0196 UBS Studio 14.11 - Studio 14.11_Copy	24.14	27.55	26.60	-3.08 %
N0196 UBS Studio 14.12 - Studio 14.12_Copy	24.14	25.55	28.44	10.16 %
N0196 UBS Studio 14.2 - Studio 14.2_Copy	19.90	19.58	23.25	15.79 %
N0196 UBS Studio 14.3 - Studio 14.3_Copy	19.90	19.58	23.25	15.79 %
N0196 UBS Studio 14.4 - Studio 14.4_Copy	19.90	30.11	36.26	16.56 %
N0196 UBS Studio 14.5 - Studio 14.5_Copy	19.90	27.64	32.76	15.62 %
N0196 UBS Studio 14.6 - Studio 14.6_Copy	19.90	17.08	20.32	15.96 %
N0196 UBS Studio 14.7 - Studio 14.7_Copy	19.90	17.08	21.37	20.07 %
N0196 UBS Studio 14.8 - Studio 14.8_Copy	19.90	16.55	21.26	22.14 %
N0196 UBS Studio 14.9 - Studio 14.9_Copy	20.70	43.14	34.64	-23.50 %
N0196 UBS Studio 27.1 - Studio 27.1_Copy	19.90	18.50	23.27	20.51 %

SAP 10 Online 2.5.18

Page 2 of 4

Block Compliance				
N0196 UBS Studio 27.2 - Studio 27.2_Copy	19.90	28.86	34.98	17.51 %
N0196 UBS Studio 27.3 - Studio 27.3_Copy	19.90	22.58	27.98	19.28 %
N0196 UBS Studio 27.4 - Studio 27.4_Copy	19.90	16.14	19.35	16.59 %
N0196 UBS Studio 27.5 - Studio 27.5_Copy	20.70	43.17	33.41	-29.21 %
N0196 UBS Studio 27.6 - Studio 27.6_Copy	19.90	18.50	23.29	20.55 %
N0196 UBS Studio 27.7 - Studio 27.7_Copy	24.14	25.73	25.64	-0.33 %
N0196 UBS Studio 27.8 - Studio 27.8_Copy	24.14	25.73	25.64	-0.33 %
N0196 UBS Studio 28.1 copy - Studio 28.1 Rev A	19.90	18.50	23.27	20.51 %
N0196 UBS Studio 28.2 Rev A - Studio 28.2	19.90	28.86	34.98	17.51 %
N0196 UBS Studio 28.3 Rev A - Studio 28.3_Copy	19.90	22.58	27.98	19.28 %
N0196 UBS Studio 28.4 Rev A - Studio 28.4	19.90	16.14	19.35	16.59 %
N0196 UBS Studio 28.5 Rev A - Studio 28.5	20.70	43.17	33.41	-29.21 %
N0196 UBS Studio 28.6 Rev A - Studio 28.6	19.90	18.50	23.29	20.55 %
N0196 UBS Studio 28.7 Rev A - Studio 28.7	24.14	25.73	25.64	-0.33 %
N0196 UBS Studio 28.8 Rev A - Studio 28.8	24.14	25.73	25.64	-0.33 %
Totals:	585.04	677.57	739.72	
Average DFEE = 24.36 kgCO ₂ /m ²	% DFEE/TFEE	PASS		
Average TFEE = 28.44 kgCO ₂ /m ²	7.88 %			

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

Block Compliance Report - DPER				
Block Reference: N0196 - Upper Brook Street REV		Block Name:		
Property-Assessment Reference	Floor area (m ²)	DPER (kWh/m ² /yr)	TPER (kWh/m ² /yr)	% DPER/TPER
N0196 UBS Studio 14.1 - Studio 14.1_Copy	19.90	51.00	140.39	63.67 %
N0196 UBS Studio 14.10 - Studio 14.10_Copy	19.90	105.33	139.41	26.45 %
N0196 UBS Studio 14.11 - Studio 14.11_Copy	24.14	91.24	126.63	27.86 %
N0196 UBS Studio 14.12 - Studio 14.12_Copy	24.14	90.37	125.34	27.90 %

SAP 10 Online 2.5.18

Page 3 of 4

Block Compliance



N0196 UBS Studio 14.2 - Studio 14.2_Copy	19.90	109.19	142.48	25.47 %
N0196 UBS Studio 14.3 - Studio 14.3_Copy	19.90	109.19	142.48	25.47 %
N0196 UBS Studio 14.4 - Studio 14.4_Copy	19.90	56.41	152.92	63.11 %
N0196 UBS Studio 14.5 - Studio 14.5_Copy	19.90	107.82	152.78	29.43 %
N0196 UBS Studio 14.6 - Studio 14.6_Copy	19.90	109.17	140.38	26.36 %
N0196 UBS Studio 14.7 - Studio 14.7_Copy	19.90	109.17	141.29	26.66 %
N0196 UBS Studio 14.8 - Studio 14.8_Copy	19.90	109.16	141.22	24.83 %
N0196 UBS Studio 14.9 - Studio 14.9_Copy	20.70	114.60	151.55	24.38 %
N0196 UBS Studio 27.1 - Studio 27.1_Copy	19.90	50.81	139.38	63.55 %
N0196 UBS Studio 27.2 - Studio 27.2_Copy	19.90	107.76	154.61	30.30 %
N0196 UBS Studio 27.3 - Studio 27.3_Copy	19.90	109.13	147.94	28.26 %
N0196 UBS Studio 27.4 - Studio 27.4_Copy	19.90	106.03	139.54	24.01 %
N0196 UBS Studio 27.5 - Studio 27.5_Copy	20.70	115.24	149.75	23.05 %
N0196 UBS Studio 27.6 - Studio 27.6_Copy	19.90	109.04	142.54	25.61 %
N0196 UBS Studio 27.7 - Studio 27.7_Copy	24.14	90.46	125.68	28.01 %
N0196 UBS Studio 27.8 - Studio 27.8_Copy	24.14	90.46	125.68	28.01 %
N0196 UBS Studio 28.1 copy - Studio 28.1 Rev A	19.90	50.81	139.38	63.55 %
N0196 UBS Studio 28.2 Rev A - Studio 28.2	19.90	107.76	154.61	30.30 %
N0196 UBS Studio 28.3 Rev A - Studio 28.3_Copy	19.90	109.13	147.94	28.26 %
N0196 UBS Studio 28.4 Rev A - Studio 28.4	19.90	106.03	139.54	24.01 %
N0196 UBS Studio 28.5 Rev A - Studio 28.5	20.70	115.24	149.75	23.05 %
N0196 UBS Studio 28.6 Rev A - Studio 28.6	19.90	109.04	142.54	25.61 %
N0196 UBS Studio 28.7 Rev A - Studio 28.7	24.14	90.46	125.68	28.01 %
N0196 UBS Studio 28.8 Rev A - Studio 28.8	24.14	90.46	125.68	28.01 %
Totals:	585.04	2603.59	3947.09	
Average DPER = 96.03 kgCO ₂ /m ²	% DPER/TPER		PASS	
Average TPER = 140.35 kgCO ₂ /m ²	31.57 %			

SAP 10 Online 2.5.18

Page 4 of 4

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

BRUKL calculations for Amenity Areas.

The following BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development due to the next stages. The results produced are run using the new Part L 2021 Building Regulations.

BRUKL Output Document

Compliance with England Building Regulations Part L 2021



Project name

Upper Brook Street BRUKL PoU DHW at higher floors As designed

Date: Tue Oct 31 15:58:01 2023

Administrative information

Building Details

Address: Manchester,

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.20

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.20

BRUKL compliance module version: v6.1.a.1

Certifier details

Name: Ridge

Telephone number:

Address: , Leeds,

Foundation area [m²]: 458.16

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² /annum	5.46
Building CO ₂ emission rate (BER), kgCO ₂ /m ² /annum	5.07
Target primary energy rate (TPER), kWh _{tp} /m ² /annum	59.31
Building primary energy rate (BPER), kWh _{tp} /m ² /annum	55.08
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _{lim}	U _{calc}	U _{calc}	First surface with maximum value
Walls*	0.26	0.15	0.15	21000002-Surf[1]
Floors	0.18	0.15	0.15	12000004-Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.15	0.15	21000002-Surf[0]
Windows** and roof windows	1.6	1.6	1.6	12000011-Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.6	1.6	1R00000B-Surf[3]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

U_{lim} = Limiting U-value weighted average U-values [W/m²K]

U_{calc} = Calculated area weighted average U-values [W/m²K]

U_{calc} = Calculated maximum individual element U-values [W/m²K]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

MB: Neither roof ventilators (inc. smoke vents) nor swimming pool buildings are modeled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m³(h,m²) at 50 Pa	8	3

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m ²]	3329.5	3329.5	4	Retail/Financial and Professional Services Restaurants and Cafes/Drinking Establishments/Takeaways Offices and Working Businesses General Industrial and Special Industrial Groups Storage or Distribution Hotels Residential Institutions: Hospitals and Care Homes Residential Institutions: Residential Schools
External area [m ²]	5673.3	5673.3		
Weather	MAN	MAN		
Infiltration [m ³ /hm ² @ 50Pa]	3	3		
Average conductance [W/K]	1861.51	1861.94		
Average U-value [W/m ² K]	0.33	0.3		
Alpha value* [%]	25.62	10		
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				
			95	Residential Institutions: Universities and Colleges Secure Residential Institutions Residential Spoons Non-residential Institutions: Community/Day Centre Non-residential Institutions: Libraries, Museums, and Galleries Non-residential Institutions: Education Non-residential Institutions: Primary Health Care Building Non-residential Institutions: Crown and County Courts General Assembly and Leisure, Night Clubs, and Theatres Others: Passenger Terminals Others: Emergency Services
			1	Others: Miscellaneous 24hr Activities Others: Car Parks 24 hrs Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	2.66	2.08
Cooling	5.36	4.34
Auxiliary	5.14	9.06
Lighting	9.45	9.61
Hot water	14.67	15.03
Equipment*	88.87	88.87
TOTAL**	37.28	40.13

* Energy used by equipment does not count towards the total for comparisons or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators. † Applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	118.26	93.15
Primary energy [kWh _{tp} /m²]	55.08	59.31
Total emissions [kg/m²]	5.07	5.46

ENVIRONMENTAL STANDARDS STATEMENT, UPPER BROOK STREET

BRUKL calculations for Block A3

The following BRUKL results relate to a RIBA Stage 2 design and will be subject to a design development due to the next stages. The results produced are run using the new Part L 2021 Building Regulations.

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Upper Brook Street Stage 2 BRUKL ASHP As designed

Date: Mon Jun 05 09:57:07 2023

Administrative information

Building Details

Address: Manchester,

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.20

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.20

BRUKL compliance module version: v6.1.e.1

Certifier details

Name: Ridge

Telephone number:

Address: , Leeds,

Foundation area [m²]: 525.89

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² /annum	3.98
Building CO ₂ emission rate (BER), kgCO ₂ /m ² /annum	3.9
Target primary energy rate (TPER), kWh _{eq} /m ² /annum	42.68
Building primary energy rate (BPER), kWh _{eq} /m ² /annum	41.91
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _o Limit	U _o Calc	U _i Calc	First surface with maximum value
Walls*	0.26	-	-	UNKNOWN
Floors	0.18	0.15	0.15	30000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.15	0.15	30000023:Surf[0]
Windows** and roof windows	1.8	0.8	0.8	30000001:Surf[5]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors*	1.6	0.82	1.6	30000003:Surf[1]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

U_o Limit = Limiting area-weighted average U-value [W/m²K]
U_o Calc = Calculated area-weighted average U-value [W/m²K]
U_i Calc = Calculated maximum individual element U-value [W/m²K]
* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.
† For fire doors, limiting U-value is 1.8 W/m²K
NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	3

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m²]	6936.5	6936.5	6	Retail/Financial and Professional Services
External area [m²]	5836.3	5836.3		
Weather	MAN	MAN		
Infiltration [m³/hm² @ 50Pa]	3	3		
Average conductance [W/K]	3530.06	3066.9		
Average U-value [W/m²K]	0.6	0.53		
Alpha value* [%]	27.44	10		
			94	

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Energy Consumption by End Use (kWh/m²)

	Actual	Notional
Heating	6.81	7.25
Cooling	0.5	0.12
Auxiliary	5.08	5.33
Lighting	8.46	8.92
Hot water	6.9	7.07
Equipment*	25.54	25.54
TOTAL**	27.75	28.69

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology (kWh/m²)

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	93.48	74.63
Primary energy [kWh _{eq} /m²]	41.91	42.68
Total emissions [kg/m²]	3.9	3.98

12. APPENDIX 3



carbon.
climate.
certified.

PBSA
Upper Brook Street
Manchester

BREEAM New Construction v6
Pre-Assessment

.....

14.04.23
Revision 01 - First Issue
(486)2321-PK-PA-PBSA_UBS_R01

www.certified.uk
team@certified.uk

1.0

Executive Summary

.....

TBC...

- + Carbon.Climate.Certified have confirmed the method of Assessment as BREEAM New Construction v6.
- + This Pre-Assessment Report concludes in a BREEAM credit score of 77.08% and a BREEAM rating of 'Excellent'.
- + Certified have also provided a list of potential areas for consideration, which could further increase the BREEAM credit score.

This report demonstrates a robust framework towards achieving the above BREEAM rating, based upon detailed review & analysis of the scheme design proposals, interviews & workshops held with the design team consultants and early scheme design information being made available to the assessor.

An efficient comfort factor in the region of 7% above the 70% benchmark for BREEAM 'Excellent' has been implemented within the scoring strategy, 3-5% is considered a healthy buffer at this stage.

All mandatory credits required to achieve a BREEAM 'Excellent' rating have been analysed and considered with the Pre-Assessment analysis.

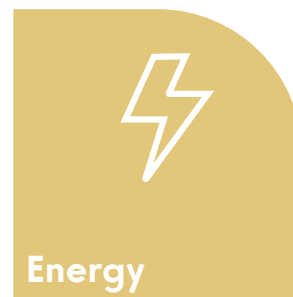
Responsibilities for credits remaining to be actioned to the satisfaction of the BREEAM Assessor will usually come from a wide range of the design team.



2.0

About BREEAM

BREEAM (Building Research Establishment Environmental Assessment Methodology) is a method for rating and certifying the performance of domestic and non-domestic new buildings and refurbishment projects. It is a national standard for use in the design and construction of buildings with a view to encouraging continuous improvement in sustainable construction.



BREEAM covers nine sections of sustainable design and additional innovation. Each section includes a number of environmental issues which are considered a source of impact on the environment. Each issue is assessed against a pre-defined performance target or standard and awarded on a 'credit' basis.

2.0

About BREEAM

Typically BREEAM performance targets are more demanding than the minimum standards needed to satisfy Building Regulations or other legislation. They represent good or best practice, are technically feasible and can be delivered by the building industry.

BREEAM uses a percentage system to award ratings based upon credit scores obtained from each of the 9 sections plus the Innovation section.

Each section is individually weighted and culminates in an overall BREEAM credit score (%) and a BREEAM rating;

85% **OUTSTANDING**

Less than top 1% of UK new non-domestic buildings (innovator)

70% **EXCELLENT**

Top 10% of UK new non-domestic buildings (best practice)

55% **VERY GOOD**

Top 25% of UK new non-domestic buildings (advanced good practice)

45% **GOOD**

All UK new non-domestic buildings should achieve this benchmark

30% **PASS**

<30% **UNCLASSIFIED**

3.0

Aims & Objectives

Aims

BREEAM assesses, encourages and rewards environmental, social and economic sustainability throughout the built environment.

The BREEAM schemes:

- + Encourage continuous performance improvement and innovation
- + Empower those who own, commission, deliver, manage or use buildings, infrastructure or communities to achieve their sustainability aspirations
- + Build confidence and value by providing independent certification that demonstrates the wider benefits to individuals, business, society and the environment

Objectives

- + To provide market recognition of buildings with a low environmental impact
- + To ensure best environmental practice is incorporated in the planning, design, construction and operation of buildings and the wider built environment
- + To challenge the market to provide innovative, cost effective solutions that minimise the environmental impact of buildings
- + To allow organisations to demonstrate progress towards corporate environmental objectives.

Principles

BREEAM is developed and operated to meet the following underlying principles:

- + Ensure environmental quality through an accessible, holistic and balanced measure of environmental impacts.
- + Use quantified measures for determining environmental quality.
- + Adopt a flexible approach that encourages and rewards positive outcomes, avoiding prescribed solutions.
- + Use robust science and best practice as the basis for quantifying and calibrating a cost effective and rigorous performance standard for defining environmental quality.
- + Integrate building professionals in the development and operational processes to ensure wide understanding and accessibility.
- + Adopt third party certification to ensure independence, credibility and consistency of the label.
- + Adopt existing industry tools, practices and other standards wherever possible to support developments in policy and technology, build on existing skills and understanding and minimise costs.



"Our biggest challenge in this new century is to take an idea that seems abstract - sustainable development - and turn it into a reality for all the world's people."

- Kofi Annan, Former UN Secretary General

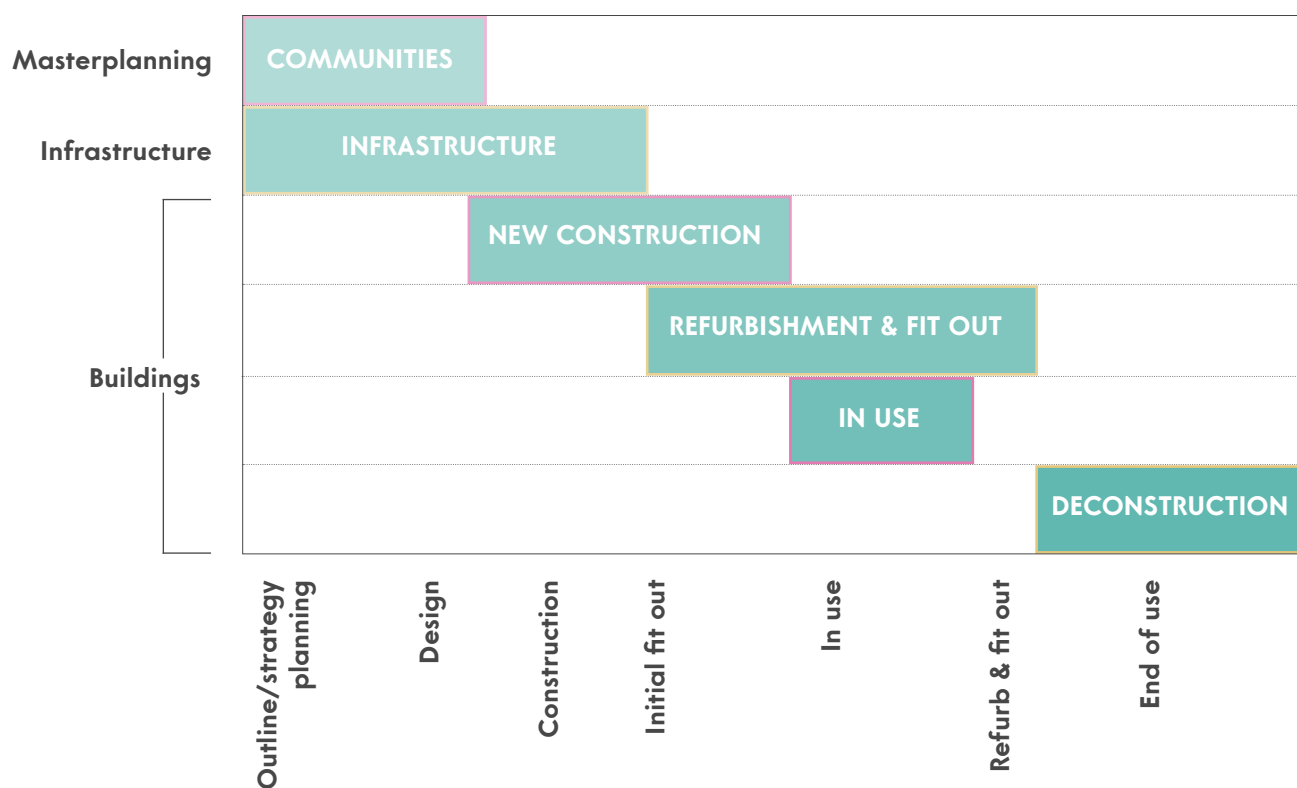


4.0

The UK BREEAM Schemes

.....

BRE Global Limited is the National Scheme Operator of BREEAM in the UK. Each BREEAM method is designed to assess the environmental performance of buildings at various stages in the life cycle, and these include:



Carbon.Climate.Certified are trained, qualified and licensed by BRE Global Limited to undertake BREEAM assessments using the above scheme documents and associated reporting and calculation tools.



5.0 Minimum Standards

To maintain a flexible system BREEAM adopts a 'balanced score-card' approach to the assessment and rating of building performance. This means that, 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.

However, 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 e.g. energy, water, waste etc.

Minimum standards by rating level:

	CATEGORY	P	G	VG	E	O
MAN 03	Construction practices	-	-	-	ONE CREDIT MAN3.3	TWO CREDITS MAN3.3
MAN 04	Commissioning and handover	-	-	MAN4.1 & BUILDING USER GUIDE	MAN4.1 & BUILDING USER GUIDE	MAN4.1 & BUILDING USER GUIDE
MAN 05	Aftercare	-	-	-	ONE CREDIT MAN5.2	ONE CREDIT MAN5.2
ENE 01	Reduction of energy use and carbon emissions	-	-	-	4 CREDITS (PERFORMANCE)	6 CREDITS (PERFORMANCE)
ENE 02	Energy monitoring	-	-	ONE CREDIT	ONE CREDIT	ONE CREDIT
WAT 01	Water consumption	-	ONE CREDIT	ONE CREDIT	ONE CREDIT	TWO CREDITS
WAT 02	Water monitoring	-	CRIT 1 ONLY	CRIT 1 ONLY	CRIT 1 ONLY	CRIT 1 ONLY
MAT 03	Responsible sourcing	CRIT 1 ONLY	CRIT 1 ONLY	CRIT 1 ONLY	CRIT 1 ONLY	CRIT 1 ONLY
WST 01	Construction waste	-	-	-	-	ONE CREDIT
WST 03	Operational waste	-	-	-	ONE CREDIT	ONE CREDIT

6.0

Building Performance By Section

CREDIT SECTION	CREDITS			WEIGHTED CREDITS		
	AVAILABLE	TARGETED	POTENTIAL	AVAILABLE	TARGETED	POTENTIAL
Management	21	18		11.1%	9.43%	
Health&Wellbeing	19	12		14.4%	8.84%	
Energy	20	12	2	16.6%	9.6%	1.60%
Transport	12	9	3	10.0%	7.5%	2.50%
Water	8	6		7.7%	5.25%	
Materials	14	13		15.5%	13.93%	
Waste	10	7		6.6%	4.2%	
Land Use & Ecology	13	11		13.3%	11.1%	
Pollution	12	8		8.8%	5.33%	
Innovation	10	2		10.0%	2.0%	
				BREEAM Credit Score	77.08%	81.18%
				BREEAM Rating	'Excellent'	'Excellent'

7.0

Assessed Building Performance By Section



"The sustainability revolution will be organic. It will arise from the visions, insights, experiments and actions of billions of people. The burden of making it happen is not on the shoulders of any one person or group. No one will get the credit, but everyone can contribute."

- Donella Meadows, US Environmental Scientist (quoted in 2004)



8.0

Credit By Credit Overview

.....

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

Project brief & design

4	4	0
---	---	---

Project delivery planning -

The project delivery stakeholders have met to define roles & responsibilities and contributions inc a Project Execution Plan

1

1

PROJECT MANAGER/
CLIENT

Third party stakeholder consultation -

Stakeholder consultation & contributions have demonstrated influence on the Project Brief / Concept Design

1

1

PROJECT MANAGER/
CLIENT

BREEAM AP (concept design) -

Appointed to facilitate the setting of contractual BREEAM performance target(s) for the project

1

1

CERTIFIED

BREEAM AP (developed design) -

Appointed to facilitate the achievement of contractual BREEAM performance target(s) for the project

1

1

CERTIFIED

MAN1: Detailed & robust project delivery planning and stakeholder consultation is assumed. Shauna Buckley (Certified) appointed as BREEAM AP.

Life cycle cost & service life planning

4	1	0
---	---	---

Elemental life cycle cost (LCC) -

Design option appraisals as 'Standardized method of life cycle costing for construction procurement' PD 156865:2008

2

0

-

Component level LCC plan -

Envelope / Services / Finishes / Spaces & influence on minimising life cycle costs and maximise critical value

1

0

-

Capital cost reporting -

Report the capital cost for the building in pounds per square metre (£k/m2)

1

1

COST CONSULTANT

MAN2: LCC cost appraisal not standard practice, costly for limited credits. Reporting of capital cost considered standard implementation.

CREDIT SUMMARY

Responsible construction practices

All timber and timber based products used on the project is 'Legally harvested and traded timber' (see Relevant definitions)

Environmental management -

The principal contractor operates an environmental management system (EMS) in accordance with ISO14001

Sustainability champion construction

(BREEAM AP) - Appointed to monitor site based activities for the construction period

Responsible construction management -

Evaluating, planning and implementing actions to minimising identified construction risks

Construction site impacts -

Monitoring, recording and reporting energy use, water consumption and transport data to KPI output

AVAILABLE TARGETED POTENTIAL

6	6	0
---	---	---

Pre-requisite

Y

CONTRACTOR

1

1

CONTRACTOR

1

1

CONTRACTOR

2

2

CONTRACTOR

2

2

CONTRACTOR

Commissioning & handover

4	4	0
---	---	---

Commissioning (pre completion) -

Independent monitor, schedule and programme of pre-commissioning, commissioning, testing, re-commissioning etc

1

1

CONTRACTOR

Commissioning (design and preparation) -

Complex building services and systems are commissioned under specialist commissioning manager & process

1

1

CONTRACTOR

Testing and inspecting building fabric -

Demonstrated through the completion of a thermographic survey, airtightness test and insulation integrity inspection

1

1

CONTRACTOR

Handover -

Two building user guides (Non-technical & Technical user) and two Training Schedules are developed prior to handover for distribution to the building occupiers and premises managers

1

1

CONTRACTOR

Aftercare

3	3	0
---	---	---

Aftercare support -

Operational infrastructure and resources in place to provide aftercare support to the building occupier(s) at handover & longer term

1

1

CONTRACTOR

Commissioning (implementation) -

Various activities to be completed over a minimum 12 month period, once the building becomes substantially occupied, inc seasonal commissioning

1

1

CONTRACTOR

Post occupancy evaluation -

A commitment to carry out a post-occupancy evaluation (POE) exercise one year after initial building occupation

1

1

CLIENT

MAN3:
Considered
standard
implementation.

MAN4:
Considered
standard
implementation.

MAN5: Considered standard implementation.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

Visual comfort

5	2	0
---	---	---

Glare control -

Potential for disabling glare has been designed out of all relevant building areas using a glare control strategy

1

1

ARCHITECT

Daylighting -

Relevant building areas meet good practice daylight factor(s) and other relevant criterion

2

0

-

View out -

95% of the floor area in relevant building areas is within 8m of a wall which has a window or permanent opening that provides an adequate view out

1

0

-

Internal/external lighting -

Lighting in all relevant areas of the building is designed to relevant CIBSE / BS guidelines and fitted with high frequency ballast

1

1

MEP

HEA1: BREEAM compliant blinds to be installed to all occupied spaces. Internal & external lighting considered standard implementation. Daylighting & view out credits not achievable.

Indoor air quality

4	0	0
---	---	---

Indoor air quality (IAQ) plan -

An indoor air quality plan is produced, with actions that minimise indoor air pollution during occupation of the building

Pre-requisite

N

-

Air quality (ventilation) -

Minimising the concentration and recirculation of pollutants in the building - inc intake/extracts, CO2 sensors, HVAC filters

1

0

-

Air quality (VOC's) -

All decorative paints and varnishes as well as other key finishes elements meet the relevant VOC criteria

2

0

-

Air quality (VOC Testing) -

Formaldehyde concentration levels and Total VOC levels measured post construction (but pre-occupancy) meet relevant criteria

1

0

-

HEA2: Ventilation credit considered unachievable due to location. Limited, but increasing, market availability of VOC compliant products.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

Thermal comfort

Thermal modelling -

Full dynamic thermal analysis carried out in accordance with CIBSE AM11. Temperature ranges are in accordance with CIBSE Guide A

3

3

0

1

1

MEP

Adaptability (climate change) -

Thermal modelling demonstrates requirements are achieved for a projected climate change environment

1

1

MEP

Thermal zoning & controls -

Thermal modelling analysis has informed the temperature control strategy for the building and its users

1

1

MEP

HEA4:

Considered standard implementation.

Acoustic performance

Acoustic performance -

Appropriate acoustic performance standards and testing requirements met for Sound Insulation, reverberation times, ambient noise

4

4

ACOUSTICIAN

HEA5: Internal ambient noise expected to align with the planning requirements. Reverberation criteria typically achieved. +5db improvement for sound insulation aligns with Moda spec.

Security

Security of site and building -

A suitably qualified security specialist (SQSS) conducts a security needs assessment (SNA) during or prior to RIBA stage 2

1

1

0

1

1

ARCHITECT

HEA6: SNA will be undertaken by a security consultant. Recommendations to be implemented by the design team, needs to take place at RIBA Stage 2.

Safe & healthy surroundings

Safe access -

Where external site areas meet relevant safety standards for pedestrian, cyclist, vehicular and delivery areas.

2

2

0

1

1

ARCHITECT

Outside space -

There is an outdoor space providing building users with an external amenity area

1

1

ARCHITECT

HEA7: Safe access criteria assumed achievable. Provision for outside space is currently shown.

CREDIT SUMMARY

Reduction of energy use and carbon emissions

Energy performance -

Calculation of energy performance ratio for new constructions (EPRNC), based on energy performance, energy consumption & CO2 emissions

Prediction of operational energy consumption -

Additional energy modelling (design and post construction stage) to generate predicted operational energy consumption figures

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

13	8	0
9	4	
4	4	

MEP

MEP

ENE1: 4 credits under Energy Performance is the minimum requirement for BREEAM 'Excellent'. Additional modelling must be undertaken in line with TM54 to predict operational energy consumption. 5 numbered credits assumed achievable.

Energy monitoring

Sub-metering (energy) -

Metering systems installed to enable at least 90% of estimated annual energy consumption of each fuel assigned to end-use categories

1	1	0
1	1	

-

ENE2: Considered standard implementation.

External lighting

External lighting -

Average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 l/ cW with relevant controls

1	1	0
1	1	

MEP

ENE3: Considered standard implementation.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

Low carbon design

Passive design (analysis) -

Passive design measures to reduce total heating, cooling, mech vent and lighting demand in line with the passive design analysis

3

2

0

1

1

MEP

Passive design (cooling) -

Building uses free cooling strategies to reduce the cooling energy demand

1

0

-

LZC technologies -

Low zero carbon feasibility study & LZC specified

1

1

MEP

ENE4: BREEAM specific passive design & LZC reports to be produced at RIBA Stage 2.

Energy efficient equipment

Energy efficient equipment -

Major systems / processes demonstrate a meaningful reduction in the total unregulated energy demand of the building

2

0

2

2

0

2

MEP/CLIENT

ENE8: Potential to be incorporated within the TM54 model produced for ENE01. Energy efficient plug in equipment must be specified.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

TRA1 Transport assessment & travel plan

Travel plan -

A site specific travel assessment & travel plan has been developed as part of the feasibility and design stages covering key travel issues & implementations.

2	2	0
---	---	---

2	2
---	---

TRAVEL
CONSULTANT

TRA1: Assessment to be undertaken as part of planning requirements.

Sustainable transport measure

Sustainable transport measures -

Identify the range of sustainable transport measures available. Credits awarded based on the Accessibility index and the number of options implemented

Assessment option 1 -

Accessibility index >8

Assessment option 2 -

Demonstrate an increase in Accessibility index or provide a dedicated service

Assessment option 3 -

Provide a public transport information system

Assessment option 4 -

Provide electric recharging stations of a minimum of 3kW for >10% of the total car parking capacity

Assessment option 5 -

Setup a car sharing group

Assessment option 6 -

Consult with the LA on how to improve the local cycling network and public accessible pedestrian routes.

Assessment option 7 -

Compliant cycle storage spaces that meet the minimum levels prescribed depending on building type

Assessment option 8 -

Compliant cycle changing / showers / drying space that meet the minimum levels prescribed

Assessment option 9 -

Close proximity to three existing local amenities relevant to building type

Assessment option 10 -

One (2 points) or more (3 points) accessible amenities are provided relevant to building type

10	7	3
----	---	---

10	7	3
----	---	---

See Below

1	1
---	---

TRANSPORT
CONSULTANT

3	0
---	---

-

1	0	1
---	---	---

ARCHITECT

1	0
---	---

-

1	0
---	---

-

2	0	2
---	---	---

ARCHITECT

1	1
---	---

ARCHITECT

1	1
---	---

ARCHITECT

1	1
---	---

TRANSPORT
CONSULTANT

1	1
---	---

3	3
---	---

ARCHITECT

TRA2: High accessibility to public transport assumed. Potential for display of public transport information to be provided in reception area. BREEAM compliant cycle storage & facilities to be provided. Potential for consultation with local authority, tbc. Relevant amenities within required distance and provided to asset.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

WAT1

Water consumption

Water consumption -

The water consumption (litres/ person/day) for the assessed building is compared against a baseline performance.

5	3	0
5	3	

ARCHITECT/MEP



WAT1: 40% improvement upon baseline performance. Low flush WC's and low flow WHB taps/ kitchen taps/ showers etc. to be considered.

WAT2

Water monitoring

Water monitoring -

Water-consuming plant / areas, consuming >10% of the total water demand, have water monitoring equipment (meters), min 1 per building.

1	1	0
1	1	

MEP



WAT2: Water sub-meters to be installed to the mains incoming water supply, and any additional high usage (water) areas.

Water leak detection & prevention

Leak detection system -

A system capable of detecting a major water leak on mains water supply between the building and utilities water meter is installed

2	2	0
1	1	

MEP

Flow control devices -

Devices that regulate the supply of water to each WC area/facility according to demand are installed

1	1	
---	---	--

MEP

WAT3

WAT3: Leak detection systems considered standard implementation. Flow control devices to be installed in communal WCs.



CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

Environmental impacts from construction products - building life cycle assessment (LCA)

7	7	0
6	6	
1	1	

Superstructure LCA -

The building's quantified environmental life cycle impact through assessment of the superstructure

LCA MODELLER
WITH DESIGN
TEAM INPUT

Substructure and hard landscaping options appraisal -

The building's quantified environmental life cycle impact through assessment of the substructure and hard landscaping

LCA MODELLER
WITH DESIGN
TEAM INPUT

MAT1: Superstructure LCA to be carried out prior to planning submission and then again at RIBA stage 4 for 2 additional credits.

Environmental impacts from construction products - Environmental product declarations (EPD)

1	1	0
1	1	

Specification of products with EPD -

Achieve a total EPD points score of 20.

ARCHITECT/
CONTRACTOR

MAT2: Increasing market availability for EPD compliant products.

Responsible sourcing of construction products

4	3	0
Pre-requisite	Y	
1	1	
3	2	

All timber and timber based products used on the project is 'Legally harvested and traded timber'

CONTRACTOR

Sustainable procurement plan -

The principal contractor sources materials for the project in accordance with a sustainable procurement plan

CONTRACTOR

Responsible sourcing of materials (RSM) -

The applicable building & hard landscaping materials are responsibly sourced in accordance with BREEAM

CONTRACTOR

MAT3: Credits considered standard implementation. Construction products with BES 6001 certification to be sought where possible.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

MAT5

Designing for durability & resilience

Robust design -
Protecting vulnerable parts of the building from damage and protection of exposed parts of the building from material degradation

1	1	0
1	1	

ARCHITECT



MAT5: Considered standard implementation.

MAT6

Material efficiency

Material efficiency -
Opportunities / measures are identified to optimise the use of materials during procurement, construction, maintenance & end of life

1	1	0
1	1	

ARCHITECT /
STRUCTURES /
CONTRACTOR



MAT6: Design report at RIBA Stage 2 with strategy for optimising the use of materials.
To be developed at each RIBA workstage.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

Construction waste management

Pre-demolition audit -

An audit of any existing buildings, structures or hard surfaces being considered for demolition.

Construction resource efficiency -

A resource management plan (RMP) has been developed covering non-hazardous construction waste & target figures met

Diversion from landfill -

Percentages of non-hazardous construction / demolition / excavation waste generated by the project are diverted from landfill

5

4

0

1

1

DEMOLITION
CONTRACTOR

3

2

CONTRACTOR

1

1

CONTRACTOR

WST1: Contractor to ensure that a robust waste management plan is in line; no more than 6.5 tonnes per 100sqm (GIFA) of construction waste to be generated and 80% (tonnage) should be diverted from landfill.

Use of recycled & sustainability sourced aggregates

Pre-demolition audit -

An audit of any existing buildings, structures or hard surfaces being considered for demolition.

Project sustainable aggregate points -

Percentage of high-grade aggregate that is recycled and/or secondary aggregate meets minimum % levels

1

0

0

Pre-Requisite

N

1

0

-

WST2: Not typically undertaken as standard practice.

Operational waste

Operational waste -

Dedicated space is provided for the segregation and storage of operational recyclable waste volumes generated by the building/unit

1

1

0

1

1

ARCHITECT

WST3: Tap for wash down to be provided within bin storage area as organic waste is expected to be produced. Specific requirements for bin provision (general, recyclable & organic waste) within each room needs to be considered.

WST5

Adaptation to climate change

1	1	0
---	---	---

Adaptation to climate change -
Conduct a climate change adaptation
strategy appraisal for structural and
fabric resilience & systematic risk
assessment

1

1

ARCHITECT /
CIVILS

WST5: Design report at RIBA Stage with strategy for climate change, to be updated at RIBA Stage 4 confirming the measures that have been implemented.

Design for disassembly and adaptability

2	1	0
---	---	---

Disassembly and adaptability
(recommendations) -

Building-specific functional adaptation
and disassembly strategy study has
been undertaken by the client & design
team

1

1

ARCHITECT /
CIVILS / MEP

Disassembly and adaptability
(implementation) -

Produce a building adaptability and
disassembly guide for prospective
tenants

1

0

-

WST6



WST6: Design report at RIBA Stage 2 with strategy for future proofing.
Production of an adaptability and disassembly guide not currently targeted but
could be considered at Stage 4 if necessary.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

Site selection

Previously occupied land -

75% of the proposed development's footprint is on an area of land which has previously been occupied / developed

2

1

0

1

1

ARCHITECT

Contaminated land -

Site deemed as significantly contaminated & confirmed by contaminated land specialist's site investigation, risk assessment & appraisal

1

0

-

LE1: Site is 'brownfield'. Land assumed not contaminated

Identifying & understanding the risks & opportunities for the project

2

2

0

Assessment route selection -

Assessment route selected using BREEAM guidance Note 34 & compliance monitored against all relevant UK and EU legislation relating to ecology of the site

Pre-Requisite

Y

ECOLOGIST/
CONTRACTOR

Survey and evaluation -

Establish current & potential ecological value, direct & indirect risks to value, and capacity for enhancement of value

1

1

ECOLOGIST

Ecological outcomes -

Avoidance, protection, reduction, on site compensation and enhancement of ecological value

1

1

ECOLOGIST/
CONTRACTOR

LE2: Preliminary Ecological Appraisal confirms existing land is of low ecological value. Ecologist to be engaged to consider the mitigation hierarchy of action (avoid, protect, reduce, etc.).

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

Managing negative impacts on ecology

Risks and opportunities-

LE02 achieved & Compliance monitored against all relevant UK and EU legislation relating to ecology of the site

3

3

0

Pre-Requisite

Y

ECOLOGIST/
CONTRACTOR

Planning, liaison, implementation and data -

Roles allocated, site preparation and construction works planned for / implemented at early stage to optimise outputs

1

1

ECOLOGIST/
CONTRACTOR

Managing negative impacts of the project -

Negative impacts from site preparation and construction works have been managed according to the hierarchy (no loss - 2 credits, minimal loss - 1 credit)

2

2

ECOLOGIST

LE3:
Team to manage impacts of ecology (if any) in accordance with the hierarchy of action outlined in LE02.

Change & enhancement of ecological value

4

3

0

Risks and opportunities-

LE03 achieved & Compliance monitored against all relevant UK and EU legislation relating to ecology of the site

Pre-Requisite

Y

ECOLOGIST/
CONTRACTOR

Liaison, implementation and data collation -

Ecological value enhanced on site and where this is not feasible, off site within the zone of influence

1

1

ECOLOGIST

Enhancement of ecology -

Credits awarded on a scale of 1-3 based on the calculation of the change in ecological value occurring as a result of the project

3

2

ECOLOGIST

LE4: Potential for current proposal to provide a net gain in ecological value.

Long term ecology management & maintenance

2

2

0

Roles & responsibilities, implementation, statutory obligations -

LE04 achieved & compliance monitored against all relevant UK and EU legislation relating to ecology of the site

Pre-Requisite

Y

ECOLOGIST/
CONTRACTOR

Planning, liaison, data, monitoring, review management & maintenance -

Strategy developed to monitor, report and maintain ecology

1

1

ECOLOGIST/
CLIENT

Landscape and ecology management plan development -

Plan developed in accordance with BS 42020:2013 covering five years

1

1

ECOLOGIST

LE5: Strategy to be developed for implementing, monitoring and maintaining ecology throughout the design, construction and operation.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

Impact of refrigerants

Impact of refrigerants -

The buildings use of refrigerants within its installed plant/systems is avoided or meet relevant BREEAM design criteria

Leak detection -

Where systems using refrigerants have a permanent automated refrigerant leak detection system installed to isolate leakages

3	0	0
2	0	
1	0	

-

-

POL1

POL1: Not expected to be achieved. To be reviewed with design team.

Local air quality

Local air quality -

Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed BREEAM levels

2	2	0
2	2	

MEP

POL2

POL2: Electric heating will meet the requirement by default.

Surface water run off

Surface water run-off -

An appropriate consultant is appointed to carry out, demonstrate and/ or confirm the surface water design strategy

Flood resilience -

Where a site specific flood risk assessment (FRA) confirms the development is situated in a low / medium risk flood zone

Surface water run-off -

Surface water run-off design solutions must be bespoke taking into account the site specific requirements

Surface water run-off (rate) -

Drainage measures ensure that peak rate of run-off from the site to the watercourses shows a 30% improvement

Surface water run-off (volume)-

Where flooding of property will not occur in the event of local drainage system failure

Minimising watercourse pollution -

There is no discharge for rainfall up to 5mm & an appropriate level of pollution prevention treatment is provided (SUDS)

5	4	0
Pre-requisite	Y	
2	2	
Pre-requisite	Y	
1	1	
1	1	
1	0	

CIVILS

CIVILS

CIVILS

CIVILS

CIVILS

-

POL3

POL3: Low flood risk & compliant surfacewater draiage strategy reviewed.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL RESPONSIBILITY

POL4

Reduction of night time light pollution

Light pollution - External lighting strategy meets ILP Guidance notes without adversely affecting the safety and security of the site and its users

1	1	0
1	1	

MEP



POL4: Considered standard implementation.

POL5

Reduction of noise pollution

External noise - A noise impact assessment in compliance with BS 4142 has been carried out & does not affect noise sensitive areas within 800m

1	1	0
1	1	

ACOUSTICIAN



POL5: 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.

CREDIT SUMMARY

AVAILABLE TARGETED POTENTIAL

RESPONSIBILITY

	10	2	0	
Man 03 Responsible construction practices	1	1		CONTRACTOR
Hea 01 Visual comfort	1	0		-
Hea 02 Indoor air quality	1	0		-
HEA06 Security	1	0		-
Ene 01 Reduction of energy use and carbon emissions	1	0		-
Wat 01 Water consumption	1	0		-
Mat 01 Environmental impacts from construction products (LCA)	1	1		LCA MODELLER
Mat 03 Responsible sourcing of construction products	1	0		-
Wst 01 Construction-site waste management	1	0		-
Wst 02 Use of recycled and sustainably sourced aggregates	1	0		-
Wst 05 Adaptation to climate change	1	0		-
LE02 Ecological risks and opportunities	1	0		-
LE04 Ecological change and enhancement	1	0		-



INN1: Third party verification to be provided for LCA (MAT01). Contractor to implement responsible construction practices.

About Us

Carbon.Climate.Certified

.....

Established for 20 years, Carbon.Climate.Certified (formerly GWP Project Services) have grown into a leading UK based Sustainability Consultant, working on multiple award winning schemes in the UK and overseas. Specialising in environmental analysis and reporting we work closely with internationally renowned Architects, designers & contractors on highly efficient, low impact modern buildings that aim to significantly reduce carbon emissions and building related costs during design, construction and operation.

Our international client base includes some of the world's most successful organisations and the UK's most established institutions such as Kings College London, Jaguar Land Rover, Price Waterhouse Cooper, Bacardi Martini and DHL.

Our knowledge, experience and contribution to Environmental Design, Built Form Sustainability and Carbon Reduction has been recognised with the award of BREEAM Assessor of the Year in 2013 & 2015, being a major contributor to their assessor network and providing internal consultancy to the BRE Global organisation and input into the development of current and future BREEAM methods.

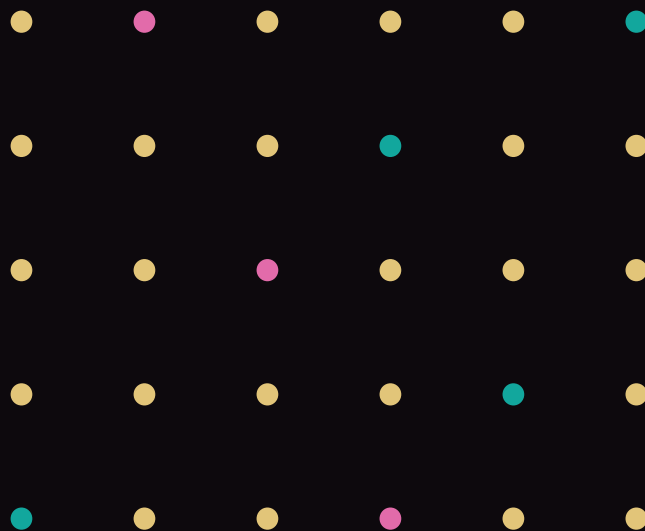
We offer a proactive approach to the challenges faced with Environmental Assessment and have developed systems and protocols specifically within the BREEAM / WELL / HQM markets to assist in the complex task of assessing and delivering certified buildings. We work very closely with the design and construction teams to ensure communication and organisation is adopted from the outset, informing the supply chain so opportunities are maximised where feasible.

CARBON.CLIMATE.CERTIFIED ARE ALSO QUALIFIED AND LICENSED IN:

- Home Quality Mark
- BREEAM NC Multi-residential
- BREEAM NC Healthcare
- BREEAM NC Commercial
- BREEAM International
- BREEAM NC Other Buildings (Bespoke)
- BREEAM Accredited Professionals
- BREEAM In-Use Assessment
- BREEAM Communities
- LEED Assessment
- Circular Economy Statements
- Life Cycle Carbon Analysis
- Carbon Consultancy
- Flood Risk Analysis
- Flood Resilience Planning
- WELL Building Standard
- PassivHaus Standard
- SKA Assessment - Retail/Offices/Education
- Fitwel



carbon.
climate.
certified.



team@certified.uk

www.certified.uk