



ELEMENT
SUSTAINABILITY

**17 QUAY STREET,
MANCHESTER**

ENVIRONMENTAL STANDARDS STATEMENT

SEPTEMBER 2022

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ELEMENT SUSTAINABILITY

CONTENTS

1. Introduction	1
2. Development Proposals.....	2
2.1 Development Site Description	2
2.2 Development Proposals	2
3. Policy Review	6
3.1 National Planning Policy.....	6
3.2 Local Planning Policy	6
3.2.1 Manchester Core Strategy.....	6
3.2.2 Guide to Development in Manchester, Supplementary Planning Document.....	9
3.2.3 Manchester's Great Outdoors.....	10
3.2.4 Climate Emergency	10
3.3 Emerging Policies	11
3.4 Regulatory Framework.....	11
3.5 Applicable Targets.....	11
4. Sustainability Statement.....	12
4.1 Energy Performance	12
4.2 Water Conservation	12
4.3 Surface Water Run-Off.....	13
4.3.1 Flood Risk.....	13
4.4 Waste Management	14
4.5 Materials	15
4.6 Ecology and Biodiversity	15
4.7 Transport	15
5. Energy Strategy	17
5.1 Build Fabric and Thermal Performance.....	17
5.1.1 Building Services Specification	18
6. Energy Performance Calculations	19
6.1 Energy Hierarchy.....	19
7. BREEAM	22
7.1 BREEAM	22
7.2 Potential BREEAM Rating.....	23
8. Conclusion	24
Appendix A- BREEAM Pre-assessment	
Appendix B – Existing BRUKL	
Appendix C – As Proposed BRUKL	



1. INTRODUCTION

Element Sustainability has been commissioned by OBI Property Ltd to review the sustainability performance of the proposed scheme at 17 Quay Street, Manchester.

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

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

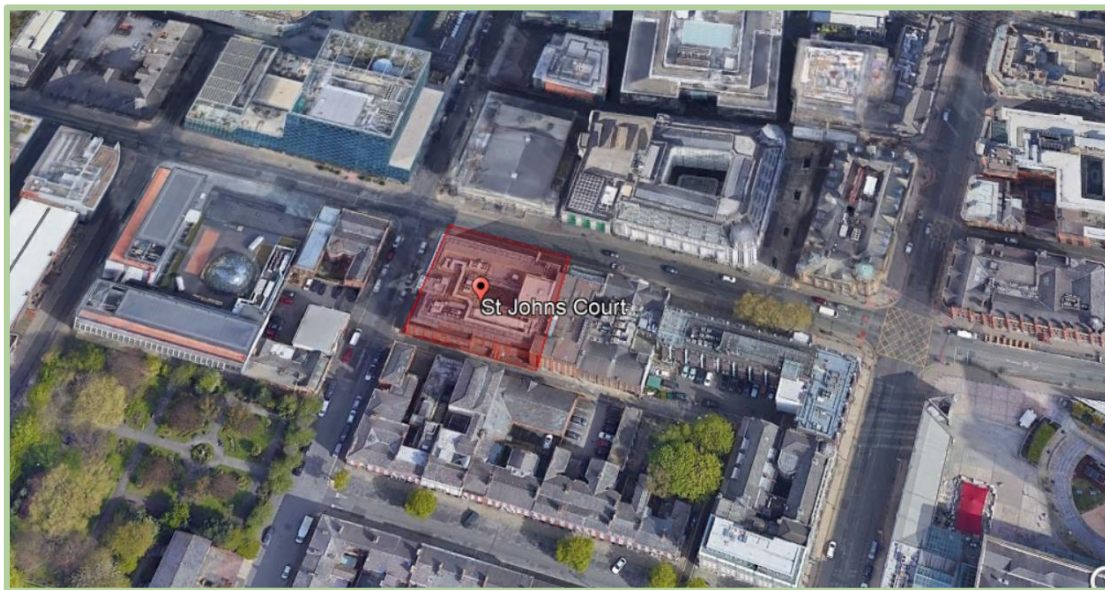


2. DEVELOPMENT PROPOSALS

2.1 Development Site Description

17 Quay Street, is a 5 storey office block in Manchester City Centre that has recently been vacated. The site is located along Quay Street within the heart of Manchester City Centre. It is bound by Quay Street to the north, Byrom Street to the west, Artillery Street to the south and is adjoined to 15 Quay Street to the east, which is also an office block.

Figure 2.1 – Pre-development site



2.2 Development Proposals

The proposed development comprises the refurbishment and 'Cat A' fit out of the office block to include:

- Updated core layout with new WCs,
- An infill of the glass atrium at the upper floors creating increased lettable area and improved office floor plate connectivity,
- Potential for new roof terrace using an unused space on the existing roof.

In addition to the internal improvements, the façade will also be improved to provide the following benefits:

- Improve identity and presence on Quay Street creating a clear office address,
- Activation of the ground floor and maximise visibility of retail,
- Improve and rationalise lettable space

Figures 2.2 to 2.7 below demonstrate the proposed floor layouts for the 17 Quay Street scheme.



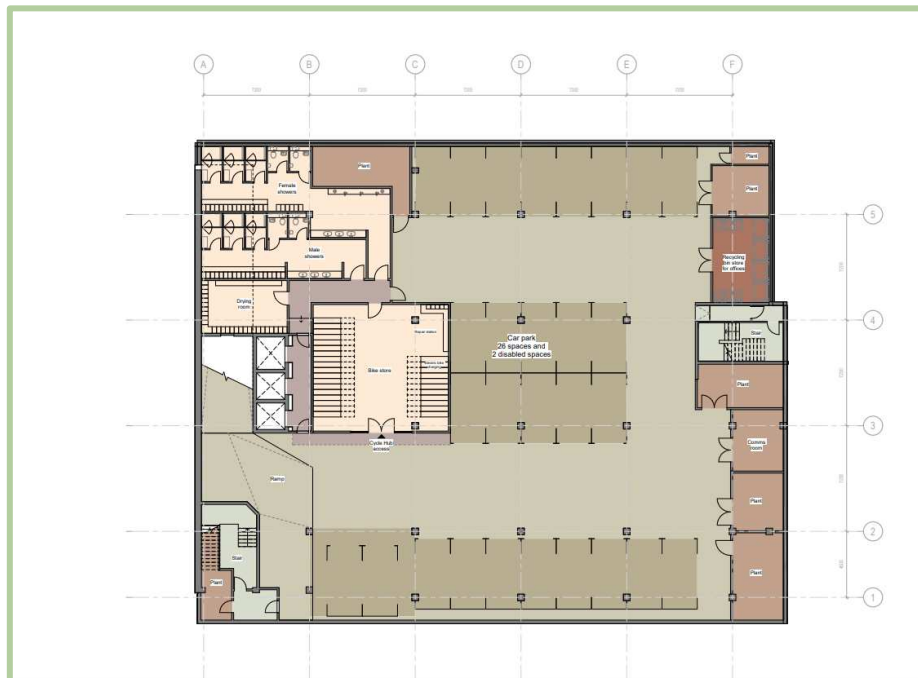
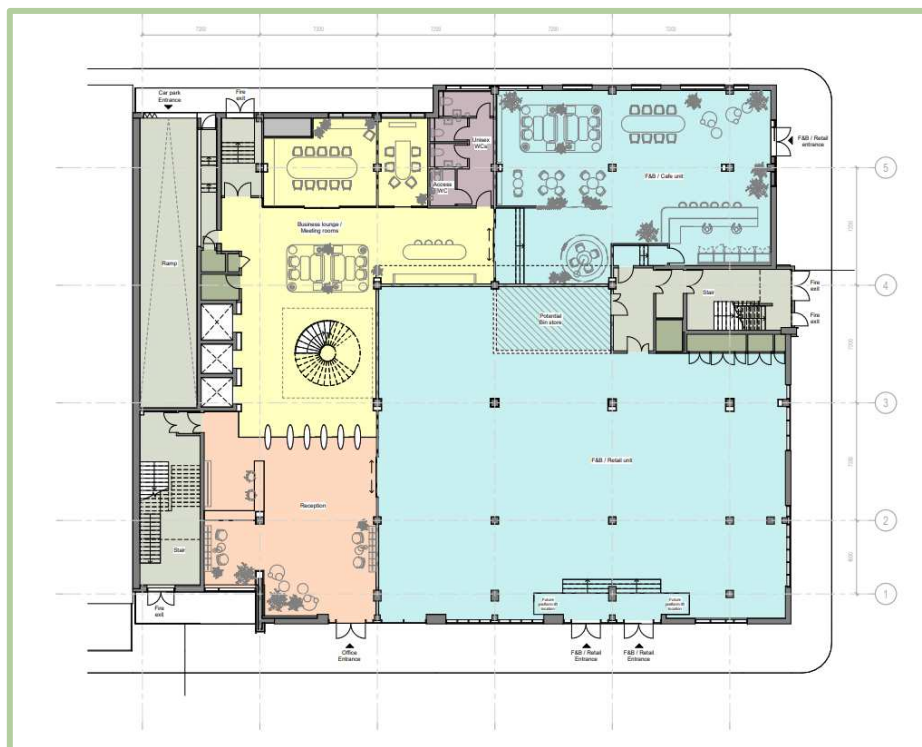
Figure 2.2 Proposed Basement Layout*Figure 2.2 – Proposed Ground Floor Layout*

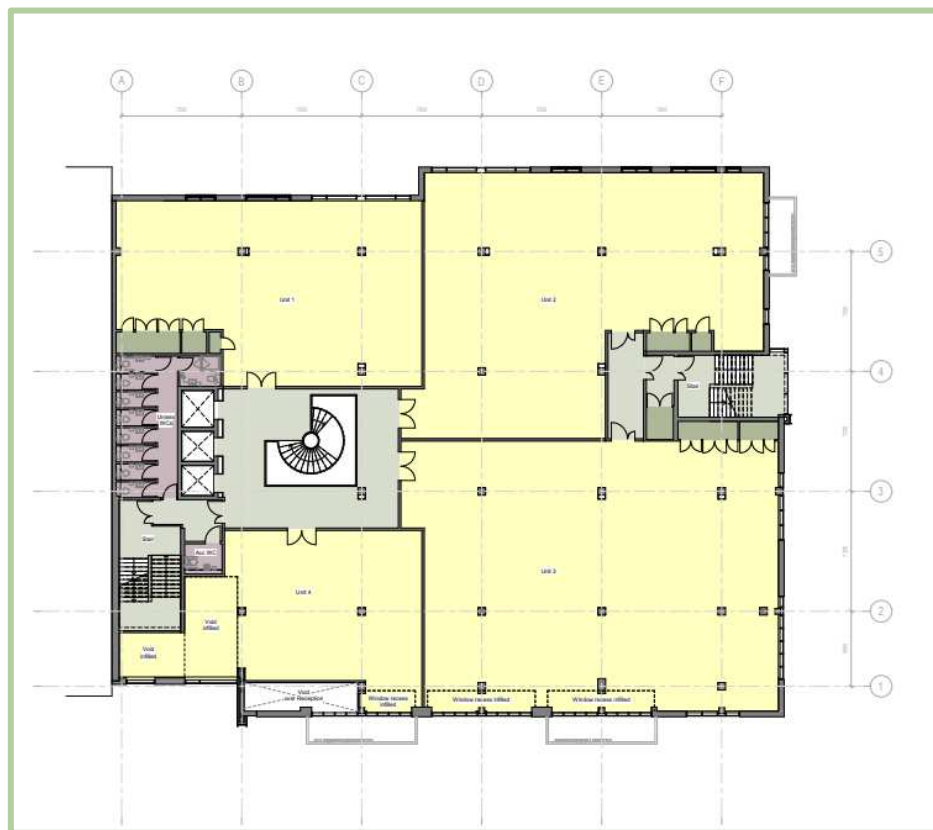
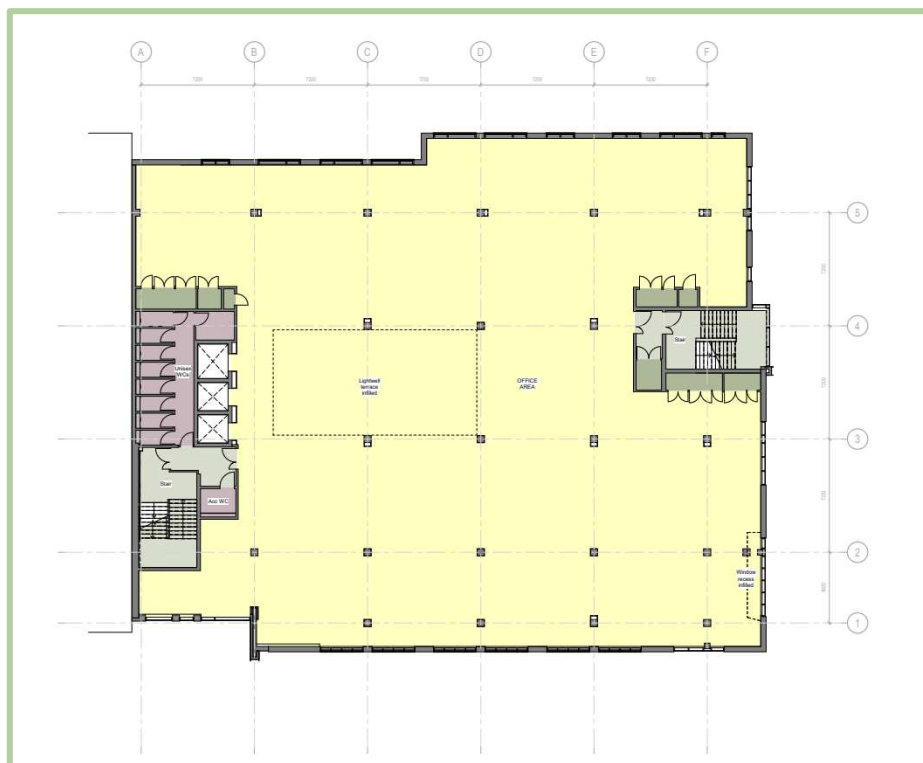
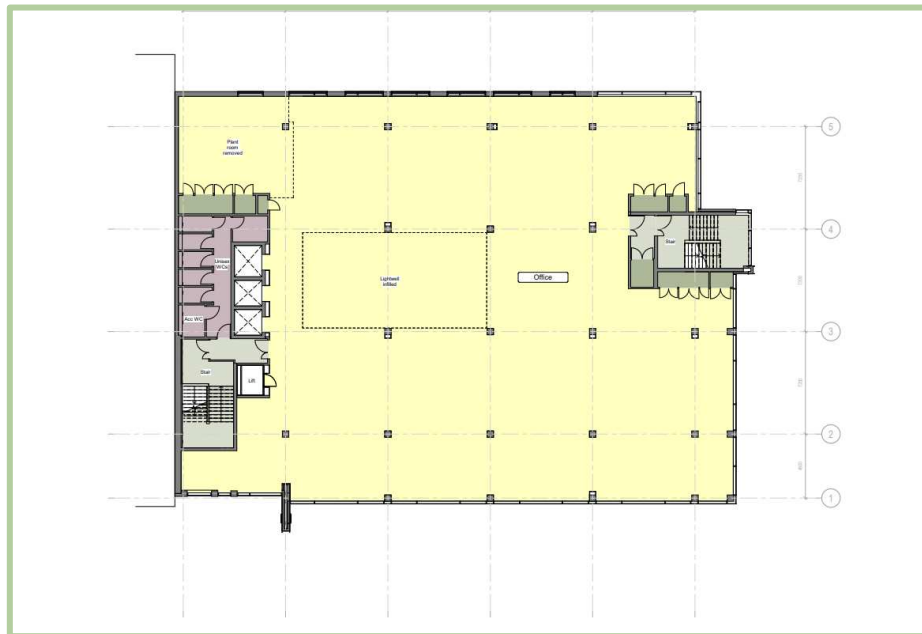
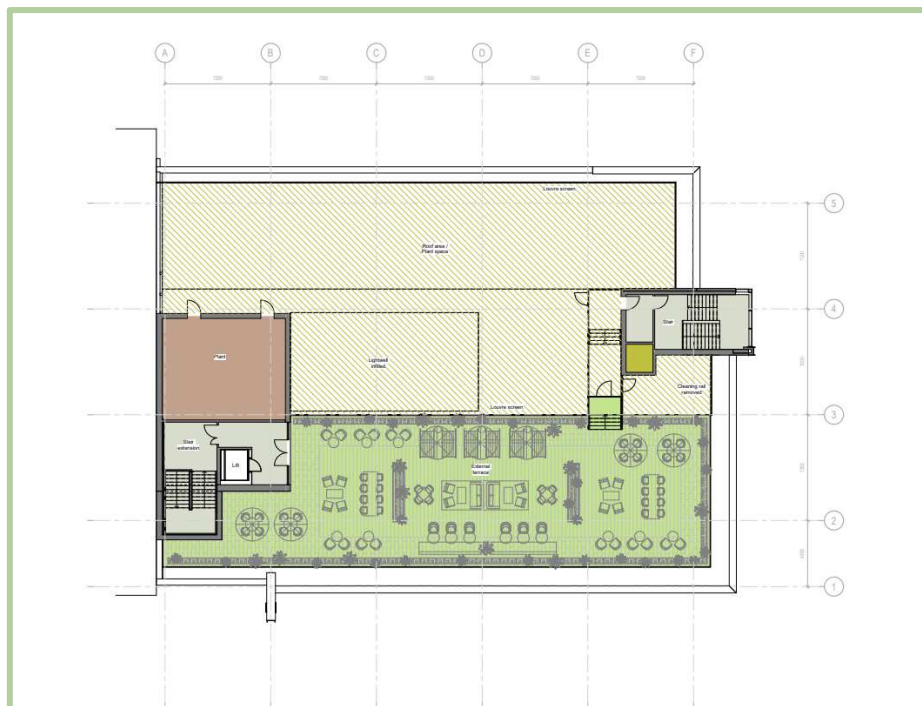
Figure 2.3 – Proposed First Floor Layout*Figure 2.4 – Proposed Third Floor Layout*

Figure 2.5 – Proposed Fifth Floor Layout*Figure 2.6 - Proposed Roof Layout*

3. POLICY REVIEW

3.1 National Planning Policy

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

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

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

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

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

3.2 Local Planning Policy

3.2.1 Manchester Core Strategy

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

Policy CC 5 - The Transport Strategy for Manchester City Centre will be delivered to ensure that transport is managed in a way which supports the projected growth of the City Centre. Developers should work with public transport providers to ensure that all users are able to access development by sustainable means, especially taking account of times when developments are likely to be busiest.

Policy T1: Sustainable Transport - To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:



- Improve choice by developing alternatives to the car;
- Improve pedestrian routes and the pedestrian environment;
- Facilitate modes of transport that reduce carbon emissions, e.g by incorporating charging points for electric vehicles, subject to their appropriate design and location;
- Take account of the needs of road users according to a broad hierarchy consisting of, in order of priority:
 - Pedestrians and disabled people
 - Cyclists, public transport,
 - Commercial access,
 - General off peak traffic,
 - General peak time traffic.

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 principle of the Energy Hierarchy;
- 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 schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes;
- The use of building materials with low embodied carbon in new development and refurbishment schemes should be prioritised.

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

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

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

CS Policy EN 6 - Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies - Applications for residential development of 10 or more units and all other development over 1,000 sq m will be expected as a minimum to provide 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 development¹.

¹ Targets associated with policy EN6 relate to new build developments and do not stipulate refurbishment targets for developments of this scale. Therefore, these targets are not applicable to this scheme.

However, the overarching aim of policy EN6 is to maximise the potential CO₂ reductions in accordance with the energy hierarchy.



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.

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

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

Policy EN 9: Green Infrastructure - New development will be expected to maintain existing green infrastructure in terms of its quantity, quality and multiple function. Where the opportunity arises and in accordance with current Green Infrastructure Strategies the Council will encourage developers to enhance the quality and quantity of green infrastructure, improve the performance of its functions and create and improve linkages to and between areas of green infrastructure. Key features of Manchester's green infrastructure will include:

- The continued development of a network of green spaces, water bodies, canals, paths and cycleways, with priority given to those parts of the city where there is an identified existing lack of open space. The Council will seek to protect existing street trees and promote new planting, particularly where this can enhance green links in the urban area.
- The continued maintenance and management of the Rivers Mersey and Irwell and their tributaries, for example the River Irk, River Medlock, Chorlton Platt Gore, Gatley Brook, Moston Brook and adjoining land, with regard to their multiple functions including recreation, flood management, and biodiversity.
- The provision of new, and improvements to the quality and accessibility of existing green infrastructure assets, to mitigate for any loss of green infrastructure as a result of development such as the Metrolink extension programme.
- The encouragement of green roofs, green walls, tree planting and other forms of green infrastructure to allow for the adaption to climate change in heavily urbanised areas.

New green infrastructure provision should be an exemplar of best practice and innovation in terms of both its design and management.

Policy EN 14: Flood Risk: Developments should consider the following:

- Development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).
- In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25², an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.
- All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the

² PPS25 sets out when FRAs are required in terms of fluvial flood risk, and with reference to the SFRA.



surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required.

- The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.

Policy EN 15: Biodiversity and Geological Conservation - The Council will seek to maintain or enhance sites of biodiversity and geological value throughout the City. Particular consideration will be given to:

- Sites with international or national designations for their biodiversity value. Manchester contains one Site of Special Scientific Interest (SSSI); there is a Special Area of Conservation (SAC) and an SSSI just over the border in Oldham (both on the Rochdale Canal within Oldham);
- Other sites of biodiversity value, including Sites of Biological Importance (SBIs) and Local Nature Reserves (LNRs); Manchester currently has 35 SBIs (including the Rochdale and Ashton Canals) and 7 LNRs; priority habitats found within Manchester, as listed in the Manchester Biodiversity Strategy and included in the Greater Manchester Biodiversity Action Plan (GM BAP);
- Protected and priority species, as listed in the Manchester Biodiversity Strategy and included in the Greater Manchester Biodiversity Action Plan (GM BAP);
- Sites that are recognised for their geological importance;
- The Council's objective to protect and conserve the City's existing trees and woodlands and the aim for a net increase in trees across the City.

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

Policy EN 19: Waste - The Council will:

- Work with other Districts through the Greater Manchester Joint Waste Development Plan Document (GMJWDPD) to safeguard existing sites for waste management and identify and safeguard new sites in existing areas of employment where appropriate.
- Require all developers, including those of new waste management facilities within the district, to demonstrate the proposal's consistency with the principles of the waste hierarchy.
- Require all developers to submit a waste management plan to demonstrate how both construction and demolition waste will be minimised and recycled on site wherever possible, and how the sustainable waste management needs of the end user will be met.
- Encourage communities to take responsibility for the waste they create through the provision of accessible facilities.

3.2.2 Guide to Development in Manchester, Supplementary Planning Document

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



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

To demonstrate energy efficiency in non-residential developments, the City Council would encourage developers to use the Building Research Establishment Environmental Assessment Method (BREEAM) which is used to assess environmental performance. Developments should be achieving a design and post-construction rating of "very good."

3.2.3 Manchester's Great Outdoors

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

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

3.2.4 Climate Emergency

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

The actions are structured into five key sections as follows:

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

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



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

3.3 Emerging Policies

The Draft 'Places for Everyone' (PfE) Plan is a new long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been prepared by the GMCA on behalf of the nine districts.

The Draft Plan will determine the kind of development that takes place across the city-region, maximising the use of brownfield land and urban spaces while protecting green belt land from the risk of unplanned development. It will also ensure all new developments take a positive approach to renewable and low carbon developments and includes an expectation that new development will be net zero carbon from 2038.

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

3.4 Regulatory Framework

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

Approved Document L2B - gives guidance on how to comply with Part L of Schedule 1 to the Building Regulations and the energy efficiency requirements for buildings other than dwellings.

3.5 Applicable Targets

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

- Policy CC5
- Policy T1: Sustainable Transport;
- Policy EN 4 – Reducing CO₂ Emissions;
 - Following the principles of the Energy Hierarchy to reducing CO₂ Emissions;
- Policy EN 6 – Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies;
- Policy EN 8 – Adaption to Climate Change;
- Policy EN 9: Green Infrastructure
- Policy EN 14: Flood Risk
- Policy EN 15: Biodiversity and Geological Conservation
- Policy EN 19: Waste
- The Guide to Development in Manchester SPD (incl. BREEAM Very Good)
- A Green and Blue Infrastructure Strategy for Manchester;
- Approved Document L2B



4. SUSTAINABILITY STATEMENT

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

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

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

4.1 Energy Performance

In order to limit energy demand and carbon dioxide (CO₂) emissions from the operation of the building, a number of design features will be integrated that will collectively contribute towards the emissions reduction of the scheme.

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

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

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

These measures will secure a 45.8% CO₂ emissions reduction over the initial building design.

4.2 Water Conservation

The proposed development will be designed to reduce mains/potable water consumption and will include the following water efficient design and equipment:



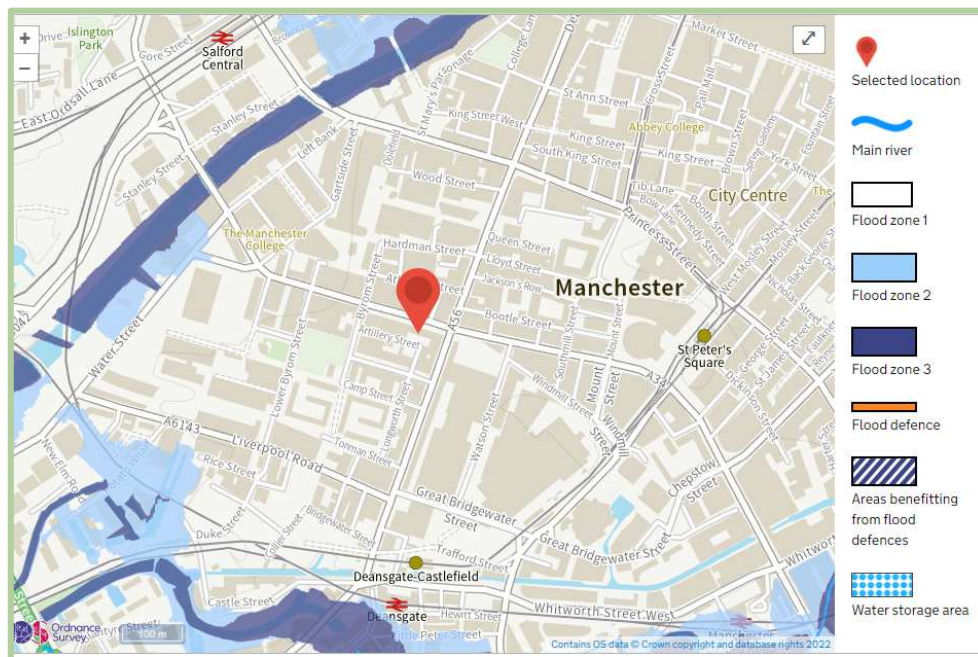
- 'A' rated appliances will be used for dishwashers and washing machines (where provided) for their water saving capabilities;
- Specification of efficient water fixtures throughout the scheme (low flow taps and showers, dual flush WCs); and,
- In order to reduce water demand, the sanitary fixtures will be specified to achieve a calculated daily consumption of <105 litres/person/day.

4.3 Surface Water Run-Off

4.3.1 Flood Risk

The site is located within Flood Zone 1, and the probability of flooding is low (with a 1 in 1000 annual probability of river or sea flooding).

Figure 4.1 - EA Flood Risk Map



The site is however classed as being at high risk from surface water flooding and has a 3.3% chance of occurring each year according to the Environment Agencies 'Extent of flooding from surface water' map presented in figure 4.2 below. Surface water will be drained directly to a public sewer to help reduce the risk of flooding.



Figure 4.2 – EA surface water flood risk map



4.4 Waste Management

Construction Waste

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

- Prior to commencement, a site waste management plan (SWMP) will be produced by the developer to limit the on and off-site environmental impacts of the development. The SWMP will detail:
 - Recycled and secondary materials;
 - Waste reduction;
 - Waste segregation;
 - Waste recovery; and,
 - Waste disposal.
- This scheme will promote the minimisation of waste arising in site development and seek to maximise the use of recycled materials in the development; and,
- A site waste management plan will identify opportunities to minimise waste generation and divert construction waste from landfill.

Operational Waste

The operational waste strategy for the scheme focuses on the segregation of waste at source, in order to maximise the potential for staff and visitors to recycle. All staff will be informed on collection frequency, as well as guidance on recycling and health and safety practices related to the management and storage of waste. The proposed strategy has been developed in compliance with the policies of Manchester Council:

- Waste will be segregated at source with the help of segregated bins. It is expected that there will be multiple streams of waste – general, recyclables and compost / green waste;



- The number of bins and subsequently the size of the refuse store is based on waste generation figures for each unit;
- The management company will be responsible for transferring the waste from the refuse store to a hardstanding service area on the day of collection by refuse operators; and
- Following collection, the bins will be returned to the refuse store.

4.5 Materials

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

- Retention of existing structural elements will reduce the need for virgin materials and limit the embodied carbon levels of the scheme.
- Materials with low environmental impact throughout their lifecycle will be specified where practically possible;
- Responsibly sourced materials from suppliers operating an Environmental Management System, or procuring timber verified by either the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification standard (PEFC);
- Local sourcing of materials where feasible and viable, which will minimise the impact of carbon dioxide emissions associated with the transportation of materials;
- Material selection will be carefully considered to avoid the use of toxic materials, such as Volatile Organic Compounds (VOCs) and contribute towards creating a healthy indoor environment; and

4.6 Ecology and Biodiversity

The developed site is of negligible ecological value. Therefore, limited habitat mitigation is considered to be necessary, and further ecological surveys are not required.

4.7 Transport

A transport statement has been produced by Vectos Limited, to provide transport and traffic advice in relation to the development at 17 Quay Street. It has been determined that the site is well located for access by sustainable modes of transport due to its city centre location. Many amenities and attractions are within the immediate vicinity of the site and can be reached on foot.

Within a 2km walk (industry guidance on the maximum commuting distance), all the city centre and many nearby residential areas of Salford and Trafford, such as Ordsall and Castlefield can be reached. Existing pedestrian links are present around the site and all footways in the surrounding area are well lit and have appropriate crossing facilities.

The site benefits from excellent cycle infrastructure, making this an effective mode of transport for short trips up to 5km. The 5km catchment encompasses the whole of Manchester City Centre and its surrounding areas including Old Trafford, Salford, Ancoats and New Islington. There are a number of designated cycle routes and



facilities in the area, including Route 6 and 55 which pass close to the site providing routes to Sheffield and Macclesfield respectively. To encourage cycling to and from the 17 Quay Street development, fifty-eight double stacked cycle racks plus an area for repair, an electric bike charging point as well as shower and changing facilities will be provided.

There are numerous bus stops within four hundred metres of the site, with the closest being Opera House bus stop. This provides one free shuttle bus service to many city centre destinations. All the free bus services connect to the main transport interchanges and help to encourage the use of this mode of transport. Alternative services from Spinningfields and the Edwardian Hotel stops, however, provide services to the surrounding area, including Hazel Grove and Stockport.

The nearest Metrolink stop is Deansgate-Castlefield which is just over four hundred metres walk from the site. This station is a major interchange station with services operating to Manchester Piccadilly, Manchester Airport, East Didsbury, Eccles, Altrincham, Bury, Rochdale Town Centre and Ashton-under-Lyne.

The site is located close to Salford Central Rail Station and Deansgate Station. Salford Central Station is located immediately to the northwest of the development and is a 5-minute walk away. Manchester Oxford Road, Manchester Victoria and Piccadilly Stations are a longer walk, but are all accessible by the free bus service and provide links nationally.

Due to the high level of accessibility, the site has achieved a Greater Manchester Accessibility Level (GMAL) score of 8³; indicating that it is classified as a highly accessible location in Greater Manchester with excellent connections to local and regional public transport services.

Therefore, due to the site's proximity to local residential areas and amenities, the presence of public transport services within easy walking distance and the existing cycle and pedestrian facilities, 17 Quay Street is considered to be well located to encourage trips to be made on foot, by bicycle or by public transport.

³ This method is a way of measuring the density of public transport provision at any location within the Greater Manchester region. The levels range from 1 which represents the least accessible sites to 8 which represents the most accessible sites.



5. ENERGY STRATEGY

The energy strategy for this development prioritises an enhanced ‘fabric led’ solution for the proposed office refurbishment. This enhanced building fabric specification throughout the scheme allied to efficient servicing and controls will help to achieve significant carbon emission reductions. Details of the proposed energy strategy are presented below.

5.1 Build Fabric and Thermal Performance

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

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

- Ground floor;
- External walls;
- Roofs;
- Doors and windows;
- Thermal (cold) bridging; and,
- Uncontrolled ventilation.

Table 5.1 presents the fabric parameters proposed for limiting heat loss and improving the building performance for proposed development.

Table 5.1 - Fabric Parameters

Construction Element	Original Fabric Specification ⁴	Proposed Fabric Specification
Ground Floor	0.45 $\text{W/m}^2\text{K}$	$U=0.22 \text{ W/m}^2\text{K}$
External Wall	0.51 $\text{W/m}^2\text{K}$	$U=0.28 \text{ W/m}^2\text{K}$
Roof	0.45 $\text{W/m}^2\text{K}$	$U=0.18 \text{ W/m}^2\text{K}$
Windows	3.15 $\text{W/m}^2\text{K}$	$U=1.60$ (G-value 0.40)
Air Permeability	25 m^3/hm^2 (@50Pa.)	<i>Design Target</i> 10 m^3/hm^2 (@50Pa.)

These specifications and design attributes for the refurbished office block will provide the following benefits:

- **High performance thermal insulation** throughout the building envelope (ensuring low U-values for all heat loss elements) and thermally efficient windows and doors will minimise heat loss through the main building elements;
- **Thermally efficient windows** will be specified with argon gas fill and low emissivity coatings to limit heat loss through the panes. The glazing g-value will be specified to optimise beneficial solar gains but limit the propensity for the building to overheat;
- **Air permeability** of 10.0 m^3/hm^2 (@50Pa.) is targeted for this build in order to minimise uncontrolled ventilation. This will further reduce heat losses and provide high levels of occupant comfort (in combination with the proposed mechanical ventilation strategy). Focus on the quality of the build is vital to deliver such airtight buildings; and,

⁴ Based upon the performance required by prevailing 2010 building regulations that this scheme was originally built and assessed under.



- **Attention to cold bridging junctions** including the provision of insulation to reduce heat and limit heat losses that occur at the junctions between building elements and around openings and will significantly improve the emission rate of the development.

This specification will help to deliver an energy efficient development that achieves an emission rate reduction and fabric energy efficiency performance significantly beyond that of the original design.

5.1.1 Building Services Specification

In addition to the improvements in the building fabric and thermal performance, a number of measures to improve the energy efficiency of the building systems have also been considered for the office block. The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the buildings is presented in Table 5.2.

Table 5.2 - Mechanical and Electrical Specification

M&E System	Existing Services Specification	Proposed Services Specification
Ventilation	Zonal Supply System	Zonal Supply System
Main Heating	Viessman Vitrocrossall 200 (gas fired condensing boiler)	Air Source Heat Pump (VRF) Supplementary Electric panel
Water Heating	Viessman Vitrocrossall 200 (gas fired condensing boiler)	Air Source Heat Pump
Cooling	DX cooling units	DX cooling units
Lighting	100% 'Low E' / LED	100% 'Low E' / LED

The mechanical and electrical specification of the refurbished development will help to deliver a Part L compliant solution, assist in the delivery of a BREEAM Domestic Refurbishment 'excellent' rated scheme, and will provide the following benefits:

- **Mechanical ventilation with heat recovery (MVHR)** systems will be specified to maintain a healthy environment and further reduce the heat losses and the energy demand of the development. The design air permeability of 10.0m³/hm² (@50Pa.) will virtually eliminate uncontrolled ventilation and ensure that the majority of the expelled stale air will pass across the heat exchanger, thereby boosting the energy reduction potential of these systems;
- **Low energy and LED lighting** will be specified throughout the scheme to maximise operational efficiencies and lifespan of the fittings. LEDs operate with an estimated energy efficiency of up to 90% when compared to traditional lighting and conventional light bulbs. This means that about c.90% of the electrical energy is converted to light, rather than wasted heat as in conventional bulbs.
- **Electrical panel heating** is 100% efficient at the point of consumption. It generates a reduced overheating potential – electric space heating delivers virtually instantaneous heating at the location it is required. Unlike a 'wet system' associated with communal gas boilers which inherently have a long lag time for the heat to be generated and then dissipated when no longer needed. This lag time can lead to overheating as the hot water remains in the radiators for a considerable time after the heat demand is required.



6. ENERGY PERFORMANCE CALCULATIONS

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

Table 6.1 below presents a summary of these calculations, which show the regulated energy demand and emission reductions achieved by the enhanced material specification and the specification of energy efficient systems for the development.

Table 6.1 – Energy Calculations

Status	Building Emission Rate (kgCO ₂ /m ² /year)	% Improvement
Pre-Refurbishment	24	45.8%
As Designed (Post Refurbishment)	13	

The calculations show that there is an expected improvement of 45.8% on the existing office block design following the proposed refurbishment upgrades to the M&E systems and build fabric.

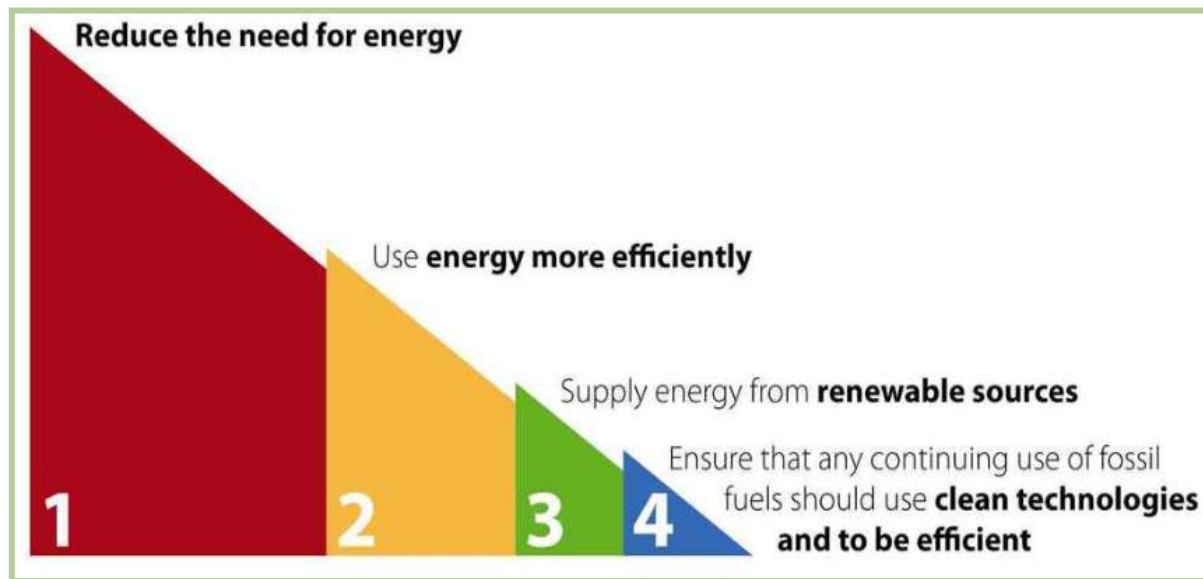
6.1 Energy Hierarchy

The 17 Quay Street scheme will incorporate a significantly enhanced material specification along with high quality design standards in order to improve the whole building energy efficiency through a ‘fabric led’ energy strategy. The proposed design and specification will deliver a scheme that is inherently energy efficient during occupation.

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



Figure 6.1 – The Energy Hierarchy

**First Principle:**

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

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

Second Principle:

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

To this effect, the following measures have been proposed:

- The design air permeability target for the building is 10.0m³/hm² (@50Pa.). This air permeability target will assist to limit the heat loss through the structure of the building;
- The g value within the building will be optimised to control solar gain in the summer months and allow beneficial gains in the winter season to minimise the overheating risk and limit the heating energy demand within the units; and
- 100% LED provision and sophisticated control systems for the space within the buildings will also ensure the energy consumed is used efficiently. Photocell switching and automatic presence control of the lighting will be specified in order to further improve the efficiency of the lighting system.



Third Principle:

The following renewable and low carbon technologies are to be included within the development:

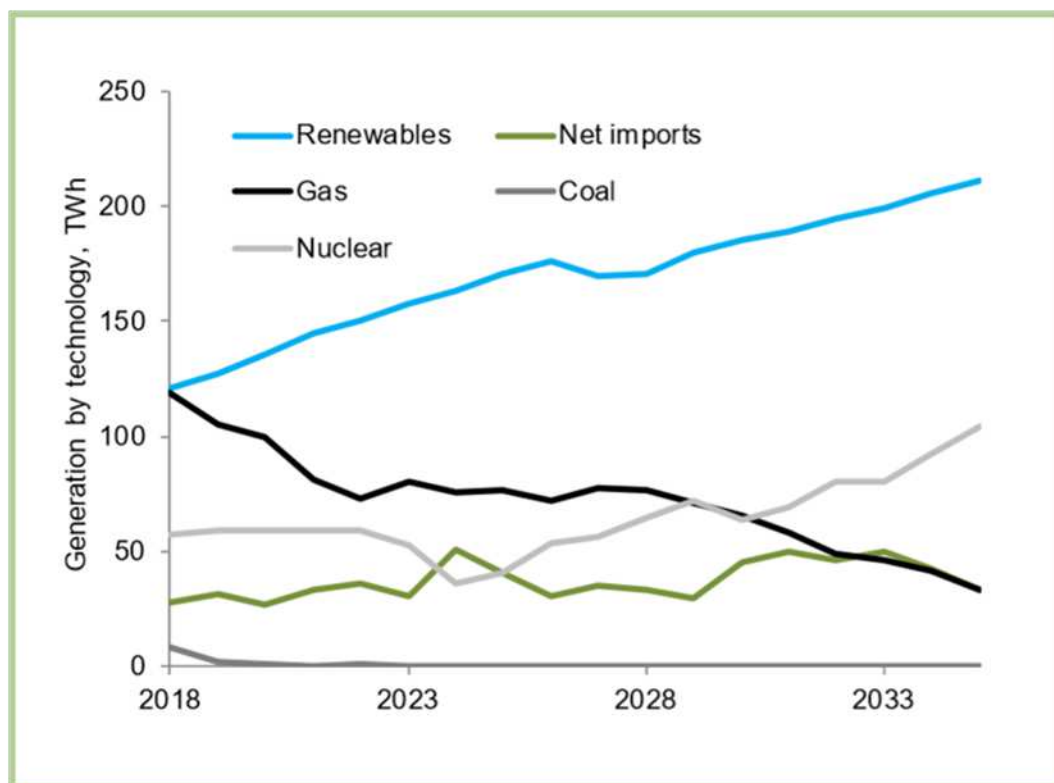
- **Air Source Heat Pumps** collect low grade heat from the air to supply useful heat for water heating requirements by applying additional energy input (in the form of electricity).

Fourth Principle:

The use of electric panels will ensure that fossil fuels converted and distributed through the National Grid as electrical energy for heating purposes will be consumed cleanly and efficiently.

Furthermore, as the UK electricity grid's carbon dioxide (CO₂) footprint continues to improve, so too would the emissions associated with the operational phase of the proposed scheme which benefits from a 'full electric' energy strategy. Figure 6.2 below presents the BEIS Energy and Emissions Projections 2018).

Figure 6.2 - Energy and Emissions Projections 2018 (BEIS)



7. BREEAM

7.1 BREEAM

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

The BREEAM UK Refurbishment and Fit Out (2014) scheme is a performance-based assessment method and certification scheme for refurbishment and fit-out projects in the UK. The primary aim of BREEAMUK Refurbishment and Fit-out 2014 is to promote the delivery of sustainable refurbishment and fit-out, in order to mitigate the life cycle impacts of existing 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 refurbishment/fit-out works process.

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

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

The BREEAM rating benchmarks for BREEAM UK new construction projects assessed using the 2018 version of BREEAM are presented in Table 7.1 below.

Table 7.1 – BREEAM Rating Benchmarks

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

The minimum standards for the BREEAM 'Excellent' rating are provided within Table 7.2 of this report. 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.

A BREEAM 'Excellent' rating requires the following minimum performance standards, see Table 7.2.



Table 7.2 – Mandatory BREEAM 'Excellent' Standards

<i>BREEAM RFO 2014 Issues</i>	<i>Minimum Standards for BREEAM for 'Excellent' rating</i>
MAN 3: Responsible Construction Practices	One credit (Considerate construction)
MAN 4: Commissioning and Handover	Criterion 9 (Building User Guide)
MAN 5: Aftercare	One credit (Seasonal commissioning)
ENE 01: Reduction of Energy Use and Carbon Emissions	Six credits
ENE 2: Energy Monitoring	One credit (First sub metering credit)
WAT 1: Water Consumption	One credit
WAT 2: Water Monitoring	Criterion 1 only
MAT 3: Responsible Sourcing of Materials	Criterion 1 only
WST 03: Operational Waste	One credit

7.2 Potential BREEAM Rating

A review of the current development proposals has been carried out against the BREEAM UK Refurbishment and Fit Out assessment methodology by a qualified, licensed BREEAM Assessor. This process determines the feasible credits and potential BREEAM rating for 17 Quay Street and demonstrates a commitment to the principles of good construction, design and sustainability.

Working alongside the qualified BREEAM assessor, the technical design team has reviewed the individual credit criteria and award of credits within the BREEAM assessment in order to optimise the building's BREEAM performance.

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

- Indicative building BREEAM score = **77.33%** (*minimum required for BREEAM 'Excellent' = 70%*)
- Indicative BREEAM rating = Potential for **BREEAM 'Excellent' rating**.

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

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



8. CONCLUSION

This Statement has reviewed the sustainability performance of the proposed 17 Quay Street development against national and local planning policies. The conclusion that can be drawn from the review is as per the following:

Sustainability Performance –

- Water consumption of the development will be minimised through the specification of **efficient water fixtures**.
- The proposed scheme location promotes access to sustainable transport options. Provision of cycle storage and facilities, and access to regular busses and trains will contribute towards creating a **highly connected and sustainable development**.
- The development Site is located within Flood Risks Zone 1. **The risk of flooding for the site is low.**
- Materials are proposed to be **responsibly sourced from local suppliers and materials with low environmental impacts** will be prioritised. Material selection will be carefully considered to avoid the use of toxic materials and materials with VOCs.
- By re-using the existing structure, it will help to reduce the need for virgin materials and limit the increase in embodied carbon.
- A BREEAM pre-assessment has been undertaken to assess the sustainability performance of the building.
- The development is targeting a **BREEAM ‘Excellent’ rating**.

Energy Strategy –

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

- A combination of **enhanced building fabric** (beyond the regulatory compliance standard), efficient mechanical and electrical systems, and controls, will achieve a significant improvement upon the pre refurbished office block;
- The refurbished office block will benefit from the use of **air source heat pumps** specified to meet water heating requirements. These systems are extremely energy efficient and will play a significant role in reducing the development’s carbon footprint;
- **Local controls** will be utilised to ensure maximum thermal comfort and energy savings; and
- Energy modelling calculates a 45.80% CO₂ emissions reduction relative to the original development, which was built in accordance with prevailing Part L 2010 Building Regulations. Demonstrating a **significantly enhanced emissions reductions** will be achieved following the refurbishment of the scheme.

In conclusion, the proposals reviewed within this statement for the scheme at 17 Quay Street in Manchester will deliver a highly energy efficient and sustainable scheme, providing a quality development that accords with the guidance provided within the Manchester City Council’ adopted planning policies.



Appendix A – BREEAM Pre Assessment





ELEMENT
SUSTAINABILITY

**17 QUAY STREET,
MANCHESTER**

REFURBISHMENT AND FIT OUT 2014 PRE-ASSESSMENT REPORT

APRIL 2022

REF: 2022.029



Contents

Executive Summary.....	2
BREEAM Methodology.....	2
Design Stage Review	2
Post Construction Stage Review	2
BREEAM Rating	3
Minimum Standards.....	3
RIBA Sensitive Credits	4



Executive Summary

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

The proposed scheme comprises the refurbishment and 'Cat A' fit-out of the office accommodation. The building provides circa. 6,029m² GIFA.

BREEAM Methodology

The BREEAM UK Refurbishment and Fit Out 2014 scheme can be used to provide an environmental performance standard against which non-domestic refurbishment and fit-out projects in the UK can be assessed and achieve a BREEAM Refurbishment and Fit-out rating.

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

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

- BREEAM UK 2014 Refurbishment and Fit Out (Commercial: Offices – Parts 1-3).
 - Part 1 – Fabric and Structure
 - Part 2 – Core Services
 - Part 3 – Local Services

Design Stage Review

Design specifications are assessed for each individual building, before construction begins. A rating is determined, and (subject to quality assurance) a Design Stage or Interim Certificate is awarded for each building. Registered assessors can apply for assessment of a site, compile and submit a design report for assessment and monitor the assessment status online.

Post Construction Stage Review

The Post Construction Stage (PCS) assessment confirms that buildings have either been built to the Design Stage specifications or to (documented) variations from the Design Stage. Variations must be reassessed so that new scores and BREEAM levels can be calculated for each affected building. Where a Design Stage assessment has been undertaken, it is used to inform the PCS assessment.



BREEAM Rating

A review of the current development proposals has been carried out against the BREEAM UK 2014 Refurbishment and Fit Out assessment methodology. It is anticipated that the scheme's design has the potential to score **77.33%** (minimum score level for BREEAM 'Excellent' rating is 70%), see Table 1.2 below.

The rating obtained by using this BREEAM Pre-Assessment is for guidance only. The predicted ratings may differ from those obtained through a formal assessment, which will be carried out by an appropriately licensed BREEAM assessor. Advice should be sought from a licensed assessor at an early stage in a project to ensure the estimated rating will be obtained.

Minimum Standards

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

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

Table 1.1 - Minimum Standards

BREEAM RFO 2014 Issues	Minimum Standards for BREEAM for 'Excellent' rating
MAN 3: Responsible Construction Practices	One Credit (Considerate Construction)
MAN 4: Commissioning and Handover	Criterion 9 (Building User Guide)
MAN 5: Aftercare	One Credit (Seasonal Commissioning)
ENE 01: Reduction of Energy Use and Carbon Emissions	Six Credits
ENE 2: Energy Monitoring	One Credit (First sub metering credit)
WAT 1: Water Consumption	One Credit
WAT 2: Water Monitoring	Criterion 1 only
MAT 3: Responsible Sourcing of Materials	Criterion 1 only
WST 3: Operational Waste	One Credit



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

RIBA Sensitive Credits

There are a number of BREEAM credits that need to be addressed at particular RIBA Stage. These credits have been highlighted in [blue](#) within Table 1.2 below. A full outline of all the RIBA Stage sensitive credits is provided within Appendix A of this report.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Table 1.2 – Pre-Assessment Review

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Management						
Man 1 – Project Brief and Design						
Man 1a	Stakeholder Consultation (Project Delivery)	1	1	0.83%	Design Team	BREEAM Criteria: 1) A clear sustainability brief is developed prior to Concept Design which sets out: a. Client requirements e.g. internal environmental conditions required b. Sustainability objectives and targets including target BREEAM rating, business objectives etc. c. Timescales and budget d. List of consultees and professional appointments that may be required e.g. Suitably Qualified Acoustician etc. e. Constraints for the project e.g. technical, legal, physical, environmental. 2) Prior to completion of the Concept Design (RIBA Stage 2 or equivalent), the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery. 3) In defining the roles and responsibilities for each key phase of the project, the following must be considered: a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Design and construction risk assessments e.g. CDM, legionella risk assessment e. Legislative requirements e.g. building control notification, heritage requirements f. Procurement and supply chain g. Identifying and measuring project success in line with project brief objectives



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						h. Occupiers' budget and technical expertise in maintaining any proposed systems i. Maintainability and adaptability of the proposals j. Requirements for the production of project and end user documentation k. Requirements for commissioning, training and aftercare support. 4) The project team demonstrates how the project delivery stakeholders' contributions, and the consultation process outcomes influence the following: 3.a Initial Project Brief 3.b Project Execution Plan 3.c Communication Strategy 3.d Concept Design. Design Stage Evidence: - Copy of the Consultation Plan setting out the scope of the consultation. - Copies of meeting minutes / construction programme / responsibilities schedule, relevant sections/clauses of the building contract. - Evidence demonstrating how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the Initial Project Brief, Project Execution Plan, Communication Strategy, and Concept Design. Post Construction Stage Evidence: - As per Design Stage.
Man 1b	Stakeholder Consultation (Third Party)	1	1	0.83%	Design Team	BREEAM Criteria: 1) Prior to completion of the Concept Design, the design team consult with all interested parties (for example actual or intended building users, representative consultation group from the existing community, existing partnerships and networks that have knowledge of existing buildings of the same type, potential users of shared facilities) on matters that cover the minimum consultation content.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						<u>Minimum Consultation Content:</u> 1. Functionality, build quality and impact (including aesthetics). 2. Provision of appropriate internal and external facilities (for future building occupants and visitors or users). 3. Management and operational implications. 4. Maintenance resources implications. 5. Impacts on the local community, e.g. local traffic or transportation impact. 6. Opportunities for shared use of facilities and infrastructure with the community or appropriate stakeholders. 7. Compliance with statutory (national or local) consultation requirements. 8. Energy use and sustainability measures. 9. Implementing principles and processes that deliver an inclusive and accessible design. Design Stage Evidence: - Consultation plan setting out the process and scope of the consultation. Post Construction Stage Evidence: - As per Design Stage.
Man 1c	Sustainability Champion (Design)	1	1	0.83%	BREEAM AP	BREEAM Criteria: 1) A Sustainability Champion has been appointed to facilitate the setting and achievement of BREEAM performance targets for the project. The design stage Sustainability Champion is appointed to perform this role during the feasibility stage (Stage 1, Preparation and Brief stage, as defined by the RIBA Plan of Work 2013 or equivalent). 2) The defined BREEAM performance target(s) has been formally agreed (see Relevant definitions) between the client and design/project team no later than the Concept Design stage (RIBA Stage 2 or equivalent). 3) To achieve this credit at the interim design stage assessment, the agreed BREEAM performance target(s) must be demonstrably achieved by the



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						project design. This must be demonstrated via the BREEAM assessor's design stage assessment report. Design Stage Evidence: - Letter of instruction to BREEAM AP. - Meeting minutes / communication records / formal notes of conversations and other statements reporting on discussions related to performance targets and maximising performance. - BREEAM AP Report. Post Construction Stage Evidence: - As per Design Stage.
Man 1d	Sustainability Champion (Monitoring Progress)	1	1	0.83%	BREEAM AP	BREEAM Criteria: 1) The Sustainability Champion criteria 9, 10 and 11 have been achieved. 2) A Sustainability Champion is appointed to monitor progress against the agreed BREEAM performance target(s) throughout the design process and formally report progress to the client and design team. Design Stage Evidence: - Letter of instruction to BREEAM AP. - Meeting minutes / communication records / formal notes of conversations and other statements reporting on discussions related to performance targets and maximising performance. - BREEAM AP Report. Post Construction Stage Evidence: - As per Design Stage.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue	Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Man 2 - Life Cycle Cost and Service Life Planning					
Man 2a	Elemental LCC	2	2	0.83%	Cost Consultant
BREEAM Criteria: 1) An outline, entire asset elemental life cycle cost (LCC) plan has been carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:20081. 2) The Elemental LCC plan: a. An outline LCC plan has been undertaken for the project based on the building's basic structure and envelope, appraising a range of options and based on the life expectancy of the refurbished building, e.g. 20, 30, 50+years. b. The servicing strategy for the project outlining services component over a 15 -year period, in the form of an 'elemental LCC Plan'. c. A fit-out strategy is developed outlining fit-out options over a 10-year period. Design Stage Evidence: - Elemental LCC Plan - Letter confirming how the Elemental LCC plan has influenced the building and system design and specification. Post Construction Stage Evidence: - As per Design Stage.					
Man 2b	Component LCC	1	1	0.83%	Cost Consultant
BREEAM Criteria: 1) A component level LCC plan has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008. 2) Demonstrate, using appropriate examples provided by the design team, how the component level LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise					



Project: 17 Quay Street, Manchester

Project No: 2022.029

Date: 19th April 2022

Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						critical value. Design Stage Evidence: - Component LCC Plan - Letter confirming how the Component LCC plan has influenced the building and system design and specification. Post Construction Stage Evidence: - As per Design Stage.
Man 2c	Capital Cost Reporting	1	1	0.83%	Client or Project Manager	BREEAM Criteria: The capital cost to be reported for the refurbishment project £/m ² . Design Stage Evidence: - Letter of Commitment confirming predicted Capital Costs. Post Construction Stage Evidence: - Letter of Confirmation confirming final Capital Costs.
Man 3 - Responsible Construction Practices						
Man 3	Timber Procurement (M)	Pre-Req	Pre-Req	-	Main Contractor	BREEAM Criteria: Main contractor to ensure that all timber is legally harvested and trade timber. Design Stage Evidence: - Letter of Commitment confirming all timber will be legally harvested and traded timber. Post Construction Stage Evidence: - Copies of all relevant certificates or chain of custody evidence.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Man 3a	Environmental Management	1	1	0.83%	Main Contractor	BREEAM Criteria: 1) The principal contractor operates an environmental management system covering their main operations. The EMS must be either: a. Third party certified, to ISO14001/EMAS or equivalent standard; or b. Have a structure that is in compliance with BS8555:2003 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system', and has completed phase audits 1 to 4, as defined in BS8555:2003. 2) The principal contractor implements best practice pollution prevention policies and procedures on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG61. Design Stage Evidence: - Letter of Commitment. Post Construction Stage Evidence: - A copy of the principal contractors EMS/EMAS certificate or for BS 8555, evidence of their status, e.g. a copy of their phase 4 audit.
Man 3b	Sustainability Champion (Construction)	1	1	0.83%	Sustainability Champion	BREEAM Criteria: 1) A Sustainability Champion is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target(s), during the Construction, Handover and Close Out stages (as defined by the RIBA Plan of Works 2013, Stages 5 and 6). 2) The defined BREEAM performance target forms a requirement of the principal contractor's contract. 3) To achieve this credit at the final post construction stage of assessment, the BREEAM-related performance target for the project must be demonstrably achieved by the project. This is demonstrated via the BREEAM assessor's final



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						post construction stage assessment report.. Design Stage Evidence: - Letter of instruction to BREEAM AP. - Formal letter of Commitment. Post Construction Stage Evidence: - Meeting minutes / communication records / formal notes of conversations and other statements reporting on discussions related to performance targets and maximising performance. - BREEAM AP Report.
Man 3c MINIMUM STANDARD (1 Credit)	Responsible Construction Management	2	2	0.83%	Main Contractor	BREEAM Criteria: 1) Where the refurbishment or fit-out project does not meet the definition of a small scale or low value project the principal contractor has used a 'compliant' organisational, local or national considerate construction scheme and their performance against the scheme has been confirmed by independent assessment and verification. 2) The BREEAM credits can be awarded as follows: a. One credit where the contractor achieves 'compliance' with the criteria of a compliant scheme. b. Two credits where the contractor significantly exceeds 'compliance' with the criteria of the scheme. Refer to the Relevant definitions section for a list of compliant schemes and therefore how performance, as determined by a compliant scheme, translates into BREEAM credits. Design Stage Evidence: - Letter of Commitment - Letter of Registration to CCS Scheme Post Construction Stage Evidence: - Final CCS Report



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
	Pre-requisite	-	-		Design Team	BREEAM Criteria: Assign responsibility to an individual for monitoring, recording and reporting energy use, water consumption and transportation data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role. Design Stage Evidence: Letter of Commitment Post Construction Stage Evidence: As per Design Stage.
Man 3d	Monitoring of Construction site impacts (Energy and Water)	1	1	0.83%	Main Contractor	BREEAM Criteria: <u>Energy Consumption</u> 1) Monitor and record data of the site energy consumption in kWh (and where relevant, litres of fuel used) as a result of the use of construction plant, equipment (mobile and fixed) and site accommodation (as relevant to the project type). 2) Report the total carbon dioxide emissions (total kgCO₂ /project value) from the construction process via the BREEAM Assessment Scoring and Reporting tool (for the purposes of potential future BREEAM performance benchmarking). <u>Water Consumption</u> 1) Monitor and record data on principal constructor's and subcontractors potable water consumption (m³) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation. 2) Using the collated data report the total net water consumption (m³), i.e.



Project: 17 Quay Street, Manchester

Project No: 2022.029

Date: 19th April 2022

Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						consumption minus any recycled water use from the construction process via the BREEAM Assessment Scoring and Reporting tool (for the purposes of potential future BREEAM performance benchmarking). Design Stage Evidence: - Letter of Commitment Post Construction Stage Evidence: - Final monitoring and recording data
Man 3e	Monitoring of Construction Site Impacts (Transport)	1	1	0.83%	Main Contractor	BREEAM Criteria: 1) Monitor and record data on transport movements and impacts resulting from delivery of the majority of refurbishment or fit-out materials to site and refurbishment, fit-out and demolition or strip-out waste from site. As a minimum this must cover: a. transportation of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply. Monitor as a minimum: - a.i. Materials used in major building elements (i.e. those defined in BREEAM issue Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)). - a.i. Ground works and landscaping materials. b. transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan. 2) Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions (kgCO₂-eq), plus total distance travelled (km) via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Letter of Commitment Post Construction Stage Evidence: - Final monitoring and recording data
Man 4 - Commissioning and Handover						
Man 4a	Commissioning and testing schedule and responsibilities	1	1	0.83%	Client/ M&E	BREEAM Criteria: 1) There is a schedule of commissioning and testing that identifies appropriate commissioning required for the scope of works that includes a suitable timescale for commissioning and re-commissioning of all relevant works carried out. 2) Commissioning should be carried out where changes are being made to the following: a. Building services (including both complex and non-complex systems) b. Building services control systems (including Building Management Systems) c. Changes to the building fabric that will affect thermal performance 3) The schedule will identify the appropriate standards that all commissioning activities will be conducted in accordance with, such as current Building Regulations, BSRIA1 and CIBSE2 guidelines and/or other appropriate standards, where applicable. Where a building management system (BMS) is specified, refer to compliance note CN8 on BMS commissioning procedures. 4) An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, commissioning, testing and, where necessary, re-commissioning activities on behalf of the client. 5) The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. Allow the required time to complete all commissioning



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						and testing activities prior to handover. Design Stage Evidence: - Letter of Commitment - Copy of Commissioning Schedule - Relevant sections / clauses of the building specification / contract - Copy of Programme of Works confirming commissioning has been accounted for. Post Construction Stage Evidence: - Copies of commissioning records / reports - Formal Letter of Confirmation listing systems commissioned in line with the Commissioning Schedule, along with details of the details of the standards/codes/Building Regulations that each system has been commissioned in accordance with. - Formal letter confirming the BMS commissioning procedures carried out in line with the BREEAM requirements.
Man 4b	Commissioning Building Services	1	1	0.83%	M&E	BREEAM Criteria: 1) The commissioning and testing schedule and responsibilities credit is achieved. 2) For projects where work is being undertaken to upgrade, renovate or install new building services and systems, an appropriate project team member needs to be appointed to undertake the work. a. For complex building services and systems, this role must be carried out by a specialist commissioning manager who is appointed during the design stage (by either client or contractor) with responsibility for: i. Undertaking design reviews and giving advice on suitability for ease of commissioning ii. Providing commissioning management input to construction programming and during installation stages



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						iii. Management of commissioning, performance testing and handover/post handover stages. b. For simple building services, this role can be carried out by an appropriate project team member (see criterion 3), provided they are not involved in the general installation works for the building services system(s). Design Stage Evidence: - Letter of Commitment - Relevant sections / clauses of the building specification / contract Post Construction Stage Evidence: - Copies of commissioning records / reports - Formal letter confirming the commissioning responsibilities carried out by the specialist commissioning manager, for all complex systems.
Man 4c	Testing and inspecting building fabric	1	1	0.83%	Main Contractor	BREEAM Criteria: 1) Projects where the fabric of the building is being upgraded, the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths is quality assured through completion of a thermographic survey as well as air tightness testing and visual inspection at appropriate times during the refurbishment. 2) The survey/testing is undertaken by a Suitably Qualified Professional in accordance with the appropriate standard, with visual inspection conducted by a representative of the main contractor or by an independent inspector such as a clerk of works. 3) Any defects identified in the site inspection, thermographic survey and the air tightness testing reports are rectified prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building/element.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Letter of Commitment confirming the appointment of a suitably qualified professional to complete post-construction testing and inspection (thermography surveys and airtightness testing) in accordance with the appropriate standard. - Formal letter confirming that any defects identified during post-construction testing and inspection will be rectified, prior to building handover, to the required performance characteristics for the building or element as defined at the design stage. Post Construction Stage Evidence: - Copy of the thermographic survey results and air tightness testing results and, where applicable, a formal letter to confirm the measures taken to rectify any defects.
Man 4d MINIMUM STANDARD	Handover	1	1	0.83%	Design Team	BREEAM Criteria: 1) A Building User Guide (BUG) is developed or (where present) an existing Building User Guide is updated, prior to handover for distribution to the building occupiers and premises managers (see Relevant definitions), with a draft copy developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users. 2) A training schedule is prepared for building occupiers/premises managers, timed appropriately around handover and proposed occupation plans, which includes the following content as a minimum: a. The design intent of refurbishment/fit-out works b. The available aftercare provision and aftercare team main contact(s), including any scheduled seasonal commissioning and post occupancy evaluation c. Introduction to, and demonstration of, installed systems and key features, particularly building management systems, controls and their interfaces, to ensure they are fully conversant with the detailed



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						operation of the building d. Introduction to the Building User Guide and other relevant building documentation, e.g. design data, technical guides, maintenance strategy, operations and maintenance (O&M) manual, commissioning records, log book etc. e. Maintenance requirements, including any maintenance contracts and regimes in place. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and/or a formal letter of commitment confirming the requirement to develop compliant Building User Guides. - Relevant sections/clauses of the building specification/contract and/or a formal letter of commitment confirming the requirement to develop training schedules. Post Construction Stage Evidence: - Copy of the BREEAM compliant Building User Guides required, covering the minimum BREEAM contents. - Formal letter confirming that the Building User Guide has been distributed to all building occupiers and premises managers. - Copy of the training schedules required, covering the minimum BREEAM contents.
Health and Wellbeing						
Hea 1 - Visual Comfort						
Hea 1a	Glare Control	1	1	0.99%	Architect	BREEAM Criteria: 1) The potential for disabling glare has been designed out of all relevant building areas using a glare control strategy, either through building form and layout and/or building design measures. 2) The glare control strategy avoids increasing lighting energy consumption, by ensuring that: a. The glare control system is designed to maximise daylight levels under



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						all conditions while avoiding disabling glare in the workplace or other sensitive areas. The system should not inhibit daylight from entering the space under cloudy conditions, or when sunlight is not on the façade: AND b. The use or location of shading does not conflict with the operation of lighting control systems. Definition: Glare control - relevant building areas <i>For glare control include areas of the building where lighting and resultant glare could be problematic for users, e.g. those areas that have been designed to contain or use workstations, projector screens etc. and sports halls.</i> Design Stage Evidence: - Glare control assessment identifying areas at risk of glare and building form, layout and/or design measures implemented in order to design out potential glare in all relevant building areas. Post Construction Stage Evidence: - Formal letter confirming that the building has been constructed according to measures identified in the glare control assessment.
Hea 1b	Daylighting	3	1	0.99%	Daylight Consultant	BREEAM Criteria: 1) Daylighting criteria have been met: • 3 Credits - 80% of relevant building areas achieve a 2% Average Daylight Factor • 2 Credits - 60% of relevant building areas achieve a 2% Average Daylight Factor • 1 Credit - 40% of relevant building areas achieve a 2% Average Daylight Factor Definition: Daylighting - relevant building areas <i>For the purpose of BREEAM, this is defined as areas within the building where good daylighting is considered to be of benefit to the building users (typically those areas occupied continuously for 30 minutes or more). This includes the</i>



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						following (where occupied continuously for 30 minutes or more) specifically stated because they are often omitted: 1. Sports hall exercise spaces 4. Kitchen and catering areas 5. General communal areas 6. Small offices (including those within multi-residential buildings) 7. Meeting rooms (including those within multi-residential buildings) 8. Leisure areas 9. Any area that may involve close up work. Design Stage Evidence: - Daylighting Calculations Post Construction Stage Evidence: - Formal letter confirming that the building has been constructed according to measures identified in the Daylighting assessment.
Hea 1c	View Out	2	1	0.99%	Architect	BREEAM Criteria: • 2 Credits - 95% of the floor area in each relevant building area is within 7m of an external wall which has a window which is at least 20% of the surrounding wall area. • 1 Credit - 80% of the floor area in each relevant building area is within 7m of an external wall which has a window which is at least 20% of the surrounding wall area. Where the room depth is greater than 7m, the percentage of window opening must be at least the same as the values in Table 1.0 BS8206: Part 2. Definition/Applicable Rooms: BREEAM defines relevant building areas requiring a view out to include areas of the building where:



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						1. There are or will be workstations or benches or desks for building users. 2. Close work will be undertaken, or visual aids will be used. Design Stage Evidence: - View Out Calculations Post Construction Stage Evidence: - Formal letter confirming that the building has been constructed according to measures identified in the View Out calculations.
Hea 1d	Internal and External Lighting	1	1	0.99%	M&E	BREEAM Criteria: 1) Internal Lighting – All internal fluorescent and compact fluorescent lamps are fitted with high frequency ballasts. Internal lighting in all relevant areas of the building is designed to provide an illuminance (lux) level appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. This can be demonstrated through a lighting design strategy that provides illuminance levels in accordance with the SLL Code for Lighting 2012 and any other relevant industry standard. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 2.4, 2.13 to 2.15, 2.20, and 6.10 to 6.20. This gives recommendations highlighting: a. Limits to the luminance of the luminaires to avoid screen reflections. b. Any area where a surface is used to reflect light into a space, such as up-lighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this. c. Recommendations for direct lighting, ceiling illuminance, and average



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						wall illuminance. 2) Zoning and Controls – Internal lighting is zoned to allow for occupant control. Zoning is in accordance with the criteria below for relevant areas present within the building: - In office areas, zones of no more than four workplaces - Workstations adjacent to windows or atria and other building areas separately zoned and controlled - Dining, restaurant, café areas: separate zoning of servery and seating or dining areas 3) External Lighting – All external lighting located within the refurbishment or fit-out zone is designed in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas³ and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places. Buildings consisting entirely of small rooms/spaces (less than 40 m²) which do not require any subdivision of lighting zones/control will meet the zoning criteria by default. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming that all internal lighting has been designed in accordance with the SLL Code for Lighting 2012, LG 7 and LG 5 (where appropriate). - Relevant sections/clauses of the building specification/contract and/or formal letter confirming that all external lighting is in accordance with BS 5489-1: 2013 Code for the practice for the design of road lighting - Lighting of roads and public amenity areas and BS EN 12464-2: 2014 Light and lighting - Lighting of workplaces - Part 2: Outdoor workplaces.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- Design drawings demonstrating the internal lighting zones and occupant controls. Post Construction Stage Evidence: - Formal letter confirming that there have been no changes to the internal and external lighting design. - 'As built' drawings showing the internal lighting layout, zones and occupant controls as per the design stage. - BREEAM assessor's site inspection.
Hea 2 Indoor Air Quality						
Hea 2a	Indoor Air Quality Plan	1	1	0.99%	Design Team/ Indoor Air Quality Specialist	BREEAM Criteria: 1) A site-specific indoor air quality plan has been produced and implemented. The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following: a. Removal of contaminant sources b. Dilution and control of contaminant sources: c. Procedures for pre-occupancy flush out d. Protection of Heating Ventilation and Air Conditioning (HVAC) systems from sources of pollution during refurbishment/fit-out works e.g. dust e. Procedures for protecting the indoor air quality of areas outside of the refurbishment or fit-out zone that may be affected by the refurbishment/fit-out works f. Procedures for identifying and implementing third party testing and analysis required to ascertain that the contaminant sources have been removed effectively before occupancy g. Commitments for maintaining indoor air quality in-use, e.g. maintenance and cleaning of the HVAC system, ductwork and filters.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Copy of Indoor Air Quality Plan. Post Construction Stage Evidence: - As per Design Stage.
Hea 2b	Ventilation	1	0	0.99%	M&E	Credit Not Targeted BREEAM Criteria: 1) The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows: a. Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation. b. Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building as follows: In air conditioned and mixed mode buildings/spaces: i. The building's air intakes and exhausts are over 10m apart and intakes are over 20m from sources of external pollution; OR ii. The location of the building's air intakes and exhausts, in relation to each other and external sources of pollution, is designed in accordance with CEN/TR 16798-4:20171 Sections 8.8.1 to 8.8.4. iii. In naturally ventilated buildings/spaces: openable windows/ventilators are over 10m from sources of external pollution. c. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN16798-3:2017(45). d. Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO ₂) or air quality sensors specified and: i. In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space. ii. In naturally ventilated buildings or spaces: sensors either have the



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						ability to alert the building owner or manager when CO₂ levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings demonstrating that fresh air into the building is designed in accordance with the criteria of the relevant standard for ventilation. Post Construction Stage Evidence: - Post completion confirmation that there has been no changes to the information provided at design stage. - 'As built' drawings at practical completion.
Hea 2c	Volatile Organic Compounds (VOCs)	N/A	N/A	N/A	Design Team and Main Contractor	Credit Not Applicable BREEAM Criteria: 1) All decorative paints and varnishes specified meet the criteria in Table 20. 2) At least five of the seven remaining product categories listed in Table 20 meet the testing requirements and emission levels criteria for volatile organic compound (VOC) emissions (listed in the table). Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming the requirement for product types to meet the emission limits, testing requirements and any additional requirements. Post Construction Stage Evidence: - Manufacturer's literature and/or a formal letter from the product manufacturer confirming compliance with the emission limits, testing requirements and any additional requirements.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Hea 2d	Volatile organic compound (VOC) emission levels (post construction)	N/A	N/A	N/A	Main Contractor/ Indoor Air Quality Specialist	Credit Not Applicable BREEAM Criteria: 1) The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/m³ averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010. 2) The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 300µg/m³ over 8 hours. 3) Where levels are found to exceed these limits, the project team confirms the measures that have, or will be, undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits. 4) The testing and measurement of the above pollutants are in accordance with the following standards where relevant: a. BS ISO16000-4:2011 Diffusive sampling of formaldehyde in air b. BS ISO16000-6:2011 VOCs in air by active sampling c. BS ENISO16017-2:2003 VOCs- Indoor, ambient and workplace air by diffusive sampling d. BS ISO16000-3:2011 Formaldehyde and other carbonyls in air by active sampling 5) The measured concentration levels of formaldehyde (µg/m³) and TVOC (µg/m³) are reported, via the BREEAM Scoring and Reporting Tool. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and/or a formal letter of commitment confirming the requirement to carry out formaldehyde and volatile organic compound testing at post construction (but pre-occupancy), in accordance with the relevant standards.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Post Construction Stage Evidence: - Copy of the VOC and formaldehyde testing report confirming emission levels that are compliant with the required standards. - Formal written confirmation of the measures taken, in accordance with the projects IAQ plan, to reduce the levels to within the stipulated limits (where applicable).
Hea 2d	Potential for Natural Ventilation	1	0	0.99%	Main Contractor/ Indoor Air Quality Specialist	Credit Not Targeted BREEAM Criteria: 1) The building ventilation strategy is designed to be flexible and adaptable to potential building occupant needs and climatic scenarios. This can be demonstrated as follows: a. Occupied spaces of the building are designed to be capable of providing fresh air entirely via a natural ventilation strategy. The following are methods deemed to satisfy this criterion dependent upon the complexity of the proposed system: i. Room depths are designed in accordance with CIBSEAM10 (section 2.4) to ensure effectiveness of any natural ventilation system. The openable window area in each occupied space is equivalent to 5% of the gross internal floor area of that room/floor plate;OR ii. The design demonstrates that the natural ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates. This is demonstrated using ventilation design tool types that meet the requirements of CIBSEAM10 (or for education buildings by using the ClassVent tool). b. For fit-out projects (Part 3 assessments), local services are designed to provide fresh air via a natural ventilation strategy and are appropriately designed according to the room depth in accordance with CIBSEAM10. 2) The natural ventilation strategy is capable of providing at least two levels of user-control on the supply of fresh air to the occupied space.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Hea 4 Thermal Comfort						
Hea 4a	Thermal modelling	1	1	0.99%	Thermal Modeller/M&E	BREEAM Criteria: 1) Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Environmental Modelling during the design stages. 2) The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. For smaller and more basic building designs with less complex heating or cooling systems, an alternative less complex means of analysis may be appropriate (such methodologies must still be in accordance with CIBSE AM11). 3) The modelling demonstrates that: a. For air-conditioned buildings, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design2, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). b. For naturally ventilated/free running buildings: i. Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). ii. The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings. 4) Where undertaking a Part 4 assessment a competent person (e.g. chartered building services engineer) must assess the suitability of existing building services and controls to identify any changes that may be required as a result



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						of fit-out works (e.g. as a result of changes to internal layout, occupant density, additional equipment that may increase cooling loads etc.). 5) For air-conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool. Design Stage Evidence: - Thermal Modelling Report - PMV (Predicted Mean Vote) and PPD (Predicted Percentage of Dissatisfied) indices based on the thermal modelling. Post Construction Stage Evidence: - Formal letter confirming that there have been no changes to the design since the thermal comfort assessment has been carried out, therefore equipment has been installed as per the design stage specification in order to achieve the design heating and cooling internal temperatures.
Hea 4b	Adaptability – for a projected climate change scenario	1	1	0.99%	Thermal Modeller/M&E	BREEAM Criteria: 1) The 'Thermal Modelling' criteria are achieved. 2) The thermal modelling demonstrates that the relevant requirements are achieved for a projected climate change environment. Where this is not met, the project team demonstrates how the building has been adapted or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements. 3) For air-conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool. Design Stage Evidence: - Thermal Modelling Report



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- PMV (Predicted Mean Vote) and PPD (Predicted Percentage of Dissatisfied) indices based on the thermal modelling. Post Construction Stage Evidence: - Formal letter confirming that there have been no changes to the design since the thermal comfort assessment has been carried out, therefore equipment has been installed as per the design stage specification in order to achieve the design heating and cooling internal temperatures.
Hea 4c	Thermal zoning and controls	1	1	0.99%	Thermal Modeller/M&E	BREEAM Criteria: 1) The 'Thermal Modelling' criteria are achieved. 2) The thermal modelling analysis has informed the temperature control strategy for the building and its users. The strategy for proposed heating or cooling systems demonstrates that it has addressed the following: a. Zones within the building, and how the building services could efficiently and appropriately heat or cool these areas. For example, consider the different requirements for the central core of a building compared with the external perimeter adjacent to the windows. b. Where specified, any new local cooling or heating services (or changes to existing services) are designed to ensure they do not conflict with core services (e.g. conflicts between two separate cooling systems, conflicts between core heating and locally provided cooling systems). c. The degree of occupant control required for these zones. This is based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) and considers: i. User knowledge of building services. ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required). iii. How the user is likely to operate or interact with the systems, e.g. are they likely to open windows, access thermostatic radiator



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						valves (TRV) on radiators, change air-conditioning settings etc. iv. The user expectations (this may differ in the summer and winter) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example some occupants like fresh air and others dislike draughts). d. How the proposed systems will interact with each other (where there is more than one system) and how this may affect the thermal comfort of the building occupants. e. The need or otherwise for an accessible building user actuated manual override for any automatic systems. Design Stage Evidence: - Copy of the temperature control strategy, covering the minimum content required by BREEAM, which has been influenced by the thermal modelling to demonstrate appropriate thermal zones and occupant controls. - Design drawings demonstrating the thermal zones and occupant controls within each occupied area of the building. Post Construction Stage Evidence: - Formal letter confirming that there have been no changes to the design stage since the thermal comfort assessment has been carried out.
Hea 5 - Acoustic Performance						
Hea 5a	Performance Standard	2	2	0.99%	Acoustician	BREEAM Criteria: 1) The building meets the appropriate acoustic performance standards and testing requirements for the acoustic principles of: a. Sound insulation b. Indoor ambient noise level



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						OFFICE BUILDING SPECIFIC REQUIREMENTS: <u>Sound Insulation</u> – The sound insulation between acoustically sensitive rooms and other occupied spaces complies with the performance criteria give in Section 7 of BS 8233:2014. <u>Indoor ambient noise levels</u> - Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS8233:2014. Design Stage Evidence: - Formal letter of appointment or other confirmation demonstrating when the acoustician was appointed. - Evidence to confirm that the acoustician is 'suitably qualified' in line with the BREEAM criteria. - Acousticians report demonstrating compliance with appropriate acoustic performance standards and testing requirements for sound insulation, indoor ambient noise levels and room acoustics. - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming that a programme of pre-completion testing will be carried out by a compliant test body in accordance with the relevant acoustic testing and measurement procedures. Post Construction Stage Evidence: - Acousticians' pre-completion testing report confirming that the requirements for sound insulation, indoor ambient noise levels and reverberation have been met. - Evidence to confirm that the acoustician is 'suitably qualified' in line with the BREEAM criteria. - Formal letter, where relevant, to confirm that all required remedial works have been carried out in accordance with the acousticians' recommendations.
Hea 6 - Safety and Security						
Hea 6a	Consultation with ALO	1	1	0.99%	Architect/ALO	BREEAM Criteria: 1) A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Stage 2 or equivalent). The purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development. 2) The SQSS develops a set of security controls and recommendations for incorporation into the proposals. Those controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA. 3) The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS. Design Stage Evidence: - Security Needs Assessment in line with BREEAM requirements. Post Construction Stage Evidence: - Formal letter confirming that the recommendations contained within the SNA have been incorporated within the building design (with examples).
Energy						
Ene 1 - Reduction of CO2 Emissions						
Ene 1a MINIMUM STANDARD (6 Credits)	Reduction of CO ₂ Emissions	15	6	0.84%	Energy Assessor	BREEAM Criteria: 1) Calculate an Energy Performance Ratio for Non Domestic Refurbishment (EPR NDR). The methodology for the EPR NDR calculation considers three metrics of modelled building performance when determining the number of credits achieved for this issue. The three metrics are: 1. The building's heating and cooling energy demand 2. The building's primary energy consumption 3. The total resulting CO₂-eq emissions.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - A copy of the building regulations output document from the approved software. Post Construction Stage Evidence: - As per interim design stage., but with the output documents from the approved software reflecting performance at the as-built stage of analysis. This must account for any changes to the specification during construction and the measured air leakage rate, ductwork leakage and fan performances (as required by building regulations).
Ene 2 - Energy Monitoring						
Ene 2a MINIMUM STANDARD	Sub-metering of major energy consuming systems	1	1	0.84%	M&E	BREEAM Criteria: 1) Install energy metering systems so that at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories. 2) Meter the energy consumption in buildings according to the total useful floor area: If the area is greater than 1,000m², by end-use category with an appropriate energy monitoring and management system. If the area is less than 1,000m², use either: - an energy monitoring and management system or - Separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system. 3) Building users can identify the energy consuming end uses, for example through labelling or data outputs.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings demonstrating the proposed metering strategy. - Details of the energy monitoring and management system. - Formal written confirmation that the end energy consuming uses will be identifiable to the building users i.e. through labelling or data outputs. Post Construction Stage Evidence: - 'As built' drawings confirming the installed metering strategy in line with the design stage specification. - BREEAM assessor's site inspection.
Ene 2b	Sub-metering of high energy load and tenancy areas	1	1	0.84%	M&E	BREEAM Criteria: 1) Monitor a significant majority of the energy supply with: a. An accessible energy monitoring and management system for: .i tenanted areas, or; .ii relevant function areas or departments in single occupancy buildings. - Computer suites - Workshops - Conference rooms - Sports halls - Data centres - IT work and study rooms, including IT-equipped library space and any space with provision of more than one computer terminal per 5m² Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings demonstrating the proposed metering strategy. - Details of the energy monitoring and management system.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- Formal written confirmation that the end energy consuming uses will be identifiable to the building users i.e. through labelling or data outputs. Post Construction Stage Evidence: - 'As built' drawings confirming the installed metering strategy in line with the design stage specification. - BREEAM assessor's site inspection.
Ene 3 - External Lighting						
Ene 3	External Lighting	1	1	0.84%	M&E	BREEAM Criteria: 1) No external lighting (which includes lighting on the building, at entrances, or signs), OR; 2) The average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt. External light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings demonstrating the proposed external lighting strategy, confirming that all external lighting is automatically controlled to prevent operation during daylight hours, with presence detection in areas of intermittent pedestrian traffic. - Manufacturer's datasheets confirming the lamp lumens and circuit Watt for each fitting, confirming an average luminous efficacy of not less than 60 lumens per circuit Watt.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Post Construction Stage Evidence: - 'As built' drawings showing the number and type of installed external light fittings, photocell and time clock, in line with the design stage specification. - Where changes have occurred since the design stage specification, please provide manufacturer's datasheets for the installed fittings confirming the lamp lumens and circuit Watt of each fitting. - BREEAM assessor's site inspection.
Ene 4 - Low Carbon Design						
Ene 4a	Passive Design Analysis	1	1	0.84%	M&E / Energy Assessor	BREEAM Criteria: 1) Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces. 2) The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures 3) The building uses passive design measures to reduce the total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with the findings of the passive design analysis and the analysis demonstrates a meaningful reduction in the total energy demand as a result. Design Stage Evidence: - Passive Design Analysis Report. - Results from a dynamic simulation model demonstrating the reduced energy demand and CO₂-eq emissions from the specified passive design measures. Post Construction Stage Evidence: - As per interim design stage.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Ene 4b	Free Cooling	1	0	0.84%	M&E / Energy Assessor	Credit Not Targeted BREEAM Criteria: 1) Achieve the passive design analysis credit. 2) Include a free cooling analysis in the passive design analysis. 3) Identify opportunities for the implementation of free cooling solutions. 4) The building is naturally ventilated or uses any combination of the free cooling strategies listed below: - Night-time cooling (which could include the use of a high exposed thermal mass) - Ground coupled air cooling - Displacement ventilation (not linked to any active cooling system) - Ground water cooling - Surface water cooling - Evaporative cooling, direct or indirect - Desiccant dehumidification and evaporative cooling, using waste heat - Absorption cooling, using waste heat.
Ene 4b	Low and Zero Carbon Feasibility Study	1	1	0.84%	M&E / Energy Assessor	BREEAM Criteria: 1) A feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by an energy specialist (see Relevant definitions) to establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy source(s) for the building/development. 2) A local LZC technology/technologies has/have been specified for the building/development in line with the recommendations of this feasibility study and this method of supply results in a meaningful reduction in regulated carbon dioxide (CO₂) emissions..



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - LZV Feasibility Report - Results from a dynamic simulation model demonstrating reductions in CO₂-eq emissions from the specified low and zero carbon technology. Post Construction Stage Evidence: - As per interim design stage.
Ene 6 - Energy Efficient Transportation Systems						
Ene 6	Lifts & Escalators	3	3	0.84%	Lift Supplier	BREEAM Criteria: <u>Energy Consumption</u> For specified lifts, escalators or moving walks (transportation types): - Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators or moving walks. - Calculate the energy consumption in accordance with BS EN ISO 25745 Part 2 (132) or Part 3 (133) for one of the following: - At least two options for each transportation type (e.g. for lifts, hydraulic, traction or machine room-less (MRL)) OR; - At least two options considering different system arrangements and control strategies. - Consider the use of regenerative drives, subject to the requirements in Regenerative drives in the BREEAM manual. - Specify the transportation system with the lowest energy consumption. <u>Energy Efficient Features</u> Specify the following three energy efficient features for each lift: - A standby condition for off-peak periods. - The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of >55 luminaire lumens per circuit



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Watt. c. Use of a drive controller capable of variable speed, variable-voltage, and variable - frequency (VVVF) control of the drive motor. Specify regenerative drives where their use is demonstrated to save energy. Design Stage Evidence: - Transportation analysis and/or calculations based on usage patterns for the building, which confirms the optimum number and size of lifts required for the development, the energy consumption of at least two types of lift in accordance with BS EN ISO 25745 Part 2 or Part 3, with the lowest energy consuming lift specified and considers the use of regenerative drives. - Manufacturer's product details and/or a formal letter of commitment from the system(s) manufacturer/supplier confirming the energy efficient features are specified. Post Construction Stage Evidence: - Manufacturer's datasheet for the installed lift, in line with the design stage specification. - Post completion confirmation that there has been no changes to the information provided at design stage. - BREEAM Assessor's site inspection.
Transport						
Tra 1 - Transport assessment and travel plan						
Tra 1	Accessibility Index	3	3	0.94%	BREEAM Assessor	BREEAM Criteria: 1) The public transport Accessibility Index (AI) for the assessed building is calculated and BREEAM credits awarded according to the building type. For Accessibility Index benchmarks see Table 34 in the Checklists and tables section. 2) The Accessibility Index is determined by entering the following information



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						into the BREEAM Tra 01 calculator: - The distance (m) from the main building entrance to each compliant public transport node - The public transport type(s) serving the compliant node, e.g. bus, rail or tram - The average number of services stopping per hour at each compliant node during the operating hours of the building for a typical day. . Design Stage Evidence: - Copy of the BREEAM Tra 01 Transport Report. - Completed Tra 01 Calculator Tool Post Construction Stage Evidence: - As per interim design stage. - BREEAM assessor's site inspection.
Tra 2 – Proximity to Amenities						
Tra 2	Proximity to Amenities	1	1	0.97%	BREEAM Assessor	BREEAM Criteria: 1) Where a building is located within close proximity (500m) of, and accessible to, local amenities which are likely to be frequently required and used by building occupants, as outlined in Table 37. - Appropriate food outlet - Access to cash - Access to a recreation/leisure facility for fitness/sports Design Stage Evidence: - BREAM Assessor Tra 02 Report Post Construction Stage Evidence: - As per interim design stage - BREEAM assessor's site inspection.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue	Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Tra 3 –Cyclist Facilities					
Tra 3a	Cycle Storage	1	1	0.94%	Architect
BREEAM Criteria: 1) Compliant cycle storage spaces that meet the minimum levels set out in Table 38 (see Checklists and tables) are installed. <u>Commercial</u> – 1 space per 10 staff Design Stage Evidence: - Letter of Commitment - Design Stage drawings Post Construction Stage Evidence: - Letter of Confirmation - 'As Built' drawings - BREEAM assessor's site inspection.					
Tra 3b	Cyclist Facilities	1	1	0.94%	Architect
BREEAM Criteria: 1) At least two of the following types of compliant cyclist facilities have been provided for all building users see Relevant definitions for the scope of each compliant cyclist facility: a. Showers b. Changing facilities c. Lockers d. Drying spaces. Design Stage Evidence: - Letter of Commitment - Design Stage drawings Post Construction Stage Evidence: - Letter of Confirmation - 'As Built' drawings					



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- BREEAM assessor's site inspection.
Tra 4 –Maximum Car Parking Capacity						
Tra 4	Car Parking Capacity	N/A	N/A	N/A	N/A	Credit Not Applicable BREEAM Criteria: The building's car parking capacity is compared to the maximum car parking capacity benchmarks in Table 39 and the relevant number of BREEAM credits awarded.
Tra 5 – Travel Plan						
Tra 5	Travel Plan	1	1	0.94%	Developer	BREEAM Criteria: 1) A travel plan has been developed as part of the feasibility and design stages . 2) A site-specific travel assessment/statement has been undertaken to ensure the travel plan is structured to meet the needs of the particular site and covers the following (as a minimum): a. Where relevant, existing travel patterns and opinions of existing building or site users towards cycling and walking so that constraints and opportunities can be identified. b. Travel patterns and transport impact of future building users. c. Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children). d. Disabled access (accounting for varying levels of disability and visual impairment). e. Public transport links serving the site. f. Current facilities for cyclists. 3) The travel plan includes a package of measures to encourage the use of sustainable modes of transport and movement of people and goods during the building's operation and use.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						4) If the occupier is known, they must be involved in the development of the travel plan and they must confirm that the travel plan will be implemented post refurbishment or fit-out and be supported by the building's management in operation. Design Stage Evidence: - Travel Plan - Letter of Commitment Post Construction Stage Evidence: - Letter of Confirmation - As per interim design stage
Water						
Wat 1 - Water Consumption						
Wat 1 MINIMUM STANDARD (1 Credit)	Water Consumption	5	3	0.97%	Architect/M&E	BREEAM Criteria: 1) An assessment of the efficiency of newly specified domestic water-consuming components and (where relevant) measures specified to retrofit existing devices is undertaken using the BREEAM Wat 01 calculator. 2) Use the standard Wat 01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. 3) The efficiency of the following 'domestic scale' water-consuming components must be included in the assessment: - WCs - Urinals - Taps (wash hand basins and where specified kitchen taps and waste disposal unit) - Showers - Baths - Dishwashers (domestic and commercial sized) and



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria														
						- Washing machine (domestic and commercial or industrial sized) <table><thead><tr><th><u>No. of BREEAM credits</u></th><th><u>% improvement</u></th></tr></thead><tbody><tr><td>1</td><td>12.5%</td></tr><tr><td>2</td><td>25%</td></tr><tr><td>3</td><td>40%</td></tr><tr><td>4</td><td>50%</td></tr><tr><td>5</td><td>55%</td></tr><tr><td>1 exemplary performance credit</td><td>65%</td></tr></tbody></table> Design Stage Evidence: - A completed copy of the BREEAM Wat 01 calculator. - Product data sheets supporting the data used to complete the calculator tool. Post Construction Stage Evidence: - As per Design Stage.	<u>No. of BREEAM credits</u>	<u>% improvement</u>	1	12.5%	2	25%	3	40%	4	50%	5	55%	1 exemplary performance credit	65%
<u>No. of BREEAM credits</u>	<u>% improvement</u>																			
1	12.5%																			
2	25%																			
3	40%																			
4	50%																			
5	55%																			
1 exemplary performance credit	65%																			
Wat 2 - Water Monitoring																				
Wat 2 MINIMUM STANDARD	Water Monitoring	1	1	0.97%	M&E	BREEAM Criteria: 1) Specify a water meter on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source. 2) For water-consuming plant or building areas consuming 10% or more of the building’s total water demand: a. Fit easily accessible sub-meters OR b. Install water monitoring equipment integral to the plant or area. 3) For each meter (main and sub): a. Install a pulsed or other open protocol communication output AND b. Connect it to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring														



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						of water consumption. If there is no BMS system in operation at Post Construction stage, award credits provided that the system used enables connection when the BMS becomes operational. 4) If the refurbishment zone is within a site that has an existing BMS, managed by the same occupier/owner (as the space undergoing refurbishment or fit-out), the pulsed/digital water meter(s) for the refurbishment or fit-out zone must be connected to the existing BMS. 5) If the refurbishment or fit-out zone is within a building that is leasehold, the pulsed/digital water meter(s) for the refurbishment or fit-out zone must be connected to the incoming water supply for water using equipment in tenanted areas. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings confirming the specification of a water meter on the mains water supply to the building, and where any water consuming plant or building areas consume 10% or more of the building's total water demand. - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming that the water meter and sub-meters will be pulsed output and connected to a BMS. Post Construction Stage Evidence: - 'As built' drawings confirming the installation of a water meter on the mains water supply to the building. - Formal letter confirming that the water meter and sub-meters will be connected to the BMS. - BREEAM assessor's site inspection.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue	Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Wat 3 - Water Leak Detection and Prevention					
Wat 3a	Leak detection system	1	1	0.97%	M&E
BREEAM Criteria: 1) A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be: a. A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks is installed. b. Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. d. Programmable to suit the owner/occupiers' water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings confirming the specification of a water leak detection system which is capable of detecting a major leak on the mains water supply within the building and between the building and the site boundary. - Manufacturer's product details demonstrating the scope of the leak detection system, in line with the BREEAM criteria. Post Construction Stage Evidence: - 'As built' drawings showing the installation of a BREEAM compliant water leak detection system. - BREEAM assessor's site inspection.					



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Wat 3b	Flow Control Devices	1	1	0.97%	M&E	BREEAM Criteria: Install flow control devices that regulate the water supply to each WC area or sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and design drawings confirming the specification of flow control devices that regulate the supply of water to each WC area/facility i.e. solenoid valves connected to PIR controls to ensure water is supplied only when needed and therefore prevent minor water leaks. Post Construction Stage Evidence: - 'As built' drawings showing the installation of solenoid valves connected to PIRs in each toilet facility. - BREEAM assessor's site inspection.
Materials						
Mat 1 Environmental impacts of Materials						
Mat 1	Project Lifecycle Assessment Study	4	2	1.40%	Architect/Structural Engineer	BREEAM Criteria: 1) Robust environmental performance information has been collected for newly specified materials or where materials are retained in situ. 2) The total number of points achieved asset out in the Methodology section are calculated using the BREEAM Mat 01 calculator option 2. The number of points scored is based on the percentage of each element that has been: a. reused in situ b. reused in situ with minor repairs c. specified with robust environmental performance information Design Stage Evidence: - Mat 01 Calculator Tool.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- Evidence in support of Mat 01 Calculator Tool Post Construction Stage Evidence: - As per Design Stage.
Mat 3 - Responsible Sourcing of Materials						
Mat 3a MINIMUM STANDARD	Timber Procurement	Pre-Req.	Pre-req.	-	Main Contractor	BREEAM Criteria: All timber and timber-based products used on the project is Legally harvested and traded timber (see Relevant definitions). Design Stage Evidence: - Letter of Commitment confirming all timber will be legally harvested and traded timber. Post Construction Stage Evidence: - Copies of all relevant certificates or chain of custody evidence.
Mat 3b	Sustainable Procurement Plan	1	1	1.40%	Main Contractor	BREEAM Criteria: 1) The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan. Design Stage Evidence: - Copy of the sustainable procurement plan, which has been produced during Concept Design (RIBA Stage 2), and includes sustainability aims, objectives and strategic targets to guide specification towards sustainable construction products. Post Construction Stage Evidence: - As per Design Stage.



Project: 17 Quay Street, Manchester

Project No: 2022.029

Date: 19th April 2022

Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Mat 3c	Major Building Elements	3	2	1.40%	Main Contractor	BREEAM Criteria: One Credit: One credit can be awarded where at least three of the material types listed in Table 53 'Material categories' has been responsibly sourced from one of the responsible sourcing schemes recognised by BREEAM as detailed in Guidance Note 18: - BES 6001 - ISO 14001 - FSC / PEFC Up to Three Credits: Up to three of the available RSM credits can be awarded where the applicable building materials are responsibly sourced in accordance with the BREEAM methodology. Design Stage Evidence: - Mat 03 Calculator - Relevant sections/clauses of the building specification/contract and design drawings confirming: a. The applicable building elements b. Details of the material specification for each applicable element. - Relevant sections/clauses of the building specification/contract and/or a formal letter of commitment confirming the requirement to procure all relevant materials from responsible sources. Post Construction Stage Evidence: - 'As built' drawings confirming the installation of materials for the applicable location and use categories as per the design stage. - Responsible sourcing certificates (i.e. ISO 14001, BES 6001 etc.) for each material comprising the applicable building elements.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Mat 4 - Insulation						
Mat 4	Insulation	1	1	1.40%	Main Contractor	BREEAM Criteria: 1) Any new insulation specified for use within the following building elements must be assessed: a. External walls b. Ground floor c. Roof d. Building services. 2) The Insulation Index for the building fabric and services insulation is the same as or greater than 2.5. Design Stage Evidence: - Mat 04 Calculator Tool. - Evidence in support of Mat 01 Calculator Tool (Product Data Sheets) Post Construction Stage Evidence: - Letter of Confirmation
Mat 5 - Designing for Robustness						
Mat 5	Designing for Robustness	1	1	1.40%	Architect	BREEAM Criteria: Protecting vulnerable parts of the building from damage 1) The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external building and landscaping elements. This must include, but is not necessarily limited to: a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						c. Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the building façade for all car parking areas and within 2m for all delivery areas. Protecting exposed parts of the building from material degradation 2) Environmental factors have been identified that are relevant to the site location. 3) Existing applicable building elements that are exposed to any relevant environmental factors have been identified. 4) Existing applicable building elements have been surveyed have been assessed to identify impacts of material degradation effects including an assessment to grade the severity of any degradation effects. 5) Design and specification measures have to be developed to repair and protect existing elements according to the severity of any degradation affects, to limit degradation. Where it is not feasible to implement measures to limit material degradation for existing elements, justification should be provided. 6) Newly specified materials or newly constructed elements (e.g. a new external wall) within the scope of refurbishment or fit-out works incorporate appropriate design and specification measures to limit material degradation due to environmental factors. Design Stage Evidence: - Design drawings illustrating the vulnerable areas/parts of the building and the durability measures specified to reduce damage to the building's fabric or materials in case of accidental or malicious damage. - Evidence confirming the applicable building elements appropriate to the building and the environmental factors likely to cause material degradation effects in the identified applicable materials.



Project: 17 Quay Street, Manchester

Project No: 2022.029

Date: 19th April 2022

Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- Relevant sections/clauses of the building specification/contract and/or design drawings confirming the elements/products achieving an appropriate quality or durability standard or design guide, as outlined in Table 9.14 of the BREEAM NC 2018 scheme guidance, or a copy of a detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors. - Relevant sections/clauses of the building specification/contract and/or design drawings demonstrating that convenient access to the roof and façade for cost-effective cleaning, replacement and repair has been included in the design, and that the roof and façade has been designed to prevent water damage, ingress and detrimental ponding. Post Construction Stage Evidence: - 'As built' drawings confirming the installation of protection measures in order to protect vulnerable areas in line with the design stage specification. - BREEAM assessor's site inspection.
Mat 6 – Material Efficiency						
Mat 6	Material Efficiency	1	1	1.40%	Design Team	BREEAM Criteria: 1) Opportunities have been identified, and appropriate measures investigated and implemented within the scope of refurbishment or fit-out works, to optimise the use of materials through building design, procurement, refurbishment, maintenance and end of life.. 2) The above is carried out by the design/construction team in consultation with the relevant parties at each of the following RIBA stages: - Preparation and Brief - Concept Design - Developed Design - Technical Design - Construction.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Details of targets, opportunities and methods reported during each RIBA Stage (1-5) to optimise the use of materials. Post Construction Stage Evidence: - Details of material efficiency measures implemented during the Developed Design (RIBA Stage 3), Technical Design (RIBA Stage 4) and Construction (RIBA Stage 5). - Provide details of the targets and actual material efficiencies achieved.
Waste						
Wst 1 - Construction Waste Management						
Wst 1a	Pre-Refurbishment Audit	1	1	0.91%	Developer	BREEAM Criteria: 1) The client shall ensure that a pre-refurbishment audit of all existing buildings, structures or hard surfaces within the scope of the refurbishment or fit-out zone is completed. 2) The requirements for carrying out an appropriate pre-refurbishment audit are a. The audit should be carried out at the Concept Design Stage (equivalent to RIBA stage 2) prior to strip-out or demolition works in order to use the audit results to guide the design, consideration of materials that can be reused, and to set targets for waste management and ensure all contractors are engaged in the process of maximising high-grade reuse and recycling opportunities. b. The audit should be carried out by a competent person (see Relevant Definitions) who has appropriate knowledge of buildings, waste and options for the reuse and recycling of different waste streams. c. Actual waste arisings and waste management routes used should be compared with those forecast from the audit and barriers to achieving targets should be investigated. 3) The audit must be referenced in the Resource Management Plan (RMP) and



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						cover: d. Identification and quantification of the key materials where present on the project e. Potential applications and any related issues for the reuse and recycling of the key materials in accordance with the waste hierarchy. f. Identification of local reprocessors or recyclers for recycling of materials g. Identification of overall recycling rate for all key materials h. Identification of reuse targets where appropriate. i. Identification of overall landfill diversion rate for all key materials. Design Stage Evidence: - Pre-Refurbishment Audit Post Construction Stage Evidence: - As per Design Stage
Wst 1b	Reuse and Direct Recycling of Materials	2	0	0.91%	Developer	Credit Not Targeted BREEAM Criteria: 1) Where, from the waste generated by the refurbishment and fit-out works, waste material types detailed in Table 65 are either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling. 2) One credit is achieved where 50% of the total available points for the waste material types detailed in Table 65, that are present on the project have been achieved. 3) Two credits are achieved where 75% of the total available points for the waste material types detailed in Table 65 , that are present on the project have been achieved.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria										
Wst 1c	Construction Resource Efficiency	3	2	0.91%	Main Contractor	BREEAM Criteria: 1) Develop and implement a compliant Resource Management Plan covering the waste arisings from the refurbishment or fit-out project with the aim of minimising waste, recording and reporting accurate data on waste arisings, excluding strip-out works waste. 2) The non-hazardous waste relating to on-site refurbishment or fit-out, and dedicated off-site manufacture or fabrication processes generated by the building’s design and construction meets, or exceeds, the resource efficiency benchmarks below. <table><thead><tr><th><u>No. of BREEAM credits</u></th><th><u>Amount of construction waste generated per 100m² (GIFA)</u></th></tr></thead><tbody><tr><td>1</td><td>≤11.3 m³ or ≤3.5 tonnes</td></tr><tr><td>2</td><td>≤4.5 m³ or ≤1.2 tonnes</td></tr><tr><td>3</td><td>≤2.1 m³ or ≤0.4 tonnes</td></tr><tr><td>1 exemplary performance credit</td><td>≤1.4 m³ or ≤0.3 tonnes</td></tr></tbody></table> Design Stage Evidence: - A copy of the Resource Management Plan. - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming the requirement for the principal contractor to develop a Resource Management Plan (RMP) covering non-hazardous waste materials (from on-site construction and dedicated off-site manufacture or fabrication), including demolition and excavation waste, and accurate data records on waste arisings and waste management routes, meeting the construction resource efficiency benchmarks in Table 10.1 of the BREEAM NC 2018 scheme guidance. Post Construction Stage Evidence: - Copy of the final compliant Resource Management Plan confirming the waste types (per waste group) generated on site relating to on site construction and dedicated off site manufacture/fabrication (excluding demolition and excavation waste).	<u>No. of BREEAM credits</u>	<u>Amount of construction waste generated per 100m² (GIFA)</u>	1	≤11.3 m³ or ≤3.5 tonnes	2	≤4.5 m³ or ≤1.2 tonnes	3	≤2.1 m³ or ≤0.4 tonnes	1 exemplary performance credit	≤1.4 m³ or ≤0.3 tonnes
<u>No. of BREEAM credits</u>	<u>Amount of construction waste generated per 100m² (GIFA)</u>															
1	≤11.3 m³ or ≤3.5 tonnes															
2	≤4.5 m³ or ≤1.2 tonnes															
3	≤2.1 m³ or ≤0.4 tonnes															
1 exemplary performance credit	≤1.4 m³ or ≤0.3 tonnes															



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Wst 1d	Diversion of waste from Landfill	1	1	0.91%	Main Contractor	BREEAM Criteria: 1) The following percentages of non-hazardous construction and demolition waste (where applicable) generated have been diverted from landfill: One Credit Refurbishment/fit-out – 85% by Volume or 90% by tonnage Demolition – 90% by Volume or 95% by tonnage Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming the requirement for the principal contractor to meet the diversion from landfill benchmarks. Post Construction Stage Evidence: - Copy of the final compliant Resource Management Plan confirming the waste types (per waste group) generated on site relating to on site construction and dedicated off site manufacture/fabrication, and the amount of waste that has been diverted from landfill.
Wst 2 – Recycled Aggregates						
Wst 2	Recycled Aggregates	1	0	0.91%	Main Contractor/Structural Engineer	Credit Not Targeted BREEAM Criteria: 1) The percentage of high grade aggregate that is recycled or secondary aggregate, specified in each application (present) must meet the following minimum % levels (by weight or volume) to contribute to the total amount of recycled or secondary aggregate, as specified in Table 68. 2) The total amount of recycled or secondary aggregate specified, and meeting criterion 1, is greater than 25% (by weight or volume) of the total high grade aggregate specified for the project. Where the minimum level in criterion 1 is not met for an application, all the aggregate in that application must be considered as primary aggregate when calculating the total high grade aggregate specified.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						3) The recycled or secondary aggregates are EITHER: a. Construction, demolition and excavation waste obtained on-site or off-site; OR b. Secondary aggregates obtained from a non-construction post-consumer industrial by product source (see Relevant definitions section).
Wst 3 - Recyclable Waste Storage						
Wst 3 MINIMUM STANDARD	Recyclable Waste Storage	1	1	0.91%	Architect/ building Owner	BREEAM Criteria: 1) Dedicated space(s) is provided for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities. This space must be: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractor. c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates. For consistent and large amounts of operational waste generated, provide: a. Static waste compactors or balers; situated in a service area or dedicated waste management space. b. Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility. c. A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						or composted on site. Design Stage Evidence: - Project team meeting minutes or a formal letter confirming the likely waste streams and indicative volumes. - Relevant sections/clauses of the building specification/contract and design drawings confirming the provision and scope of dedicated facilities (i.e. storage of recyclable waste streams, access arrangements, and capacity). - Relevant sections/clauses of the building specification/contract and design drawings confirming the provision of a compactor/baler, where there is a consistent generation in volume of packaging waste, and a vessel(s) for composting or adequate space for storing segregated food waste and compostable organic material, along with a bib tap near to or within the waste/composting storage facility (where applicable). Post Construction Stage Evidence: - 'As built' drawings showing the installed areas provided for the storage and segregation of recyclable waste and general waste, in line with the design stage specification. - BREEAM assessor's site inspection.
Wst 4 – Speculative Floor and Ceiling Finishes						
Wst 4	Speculative Floor and Ceiling Finishes	1	1	0.91%	Architect/ building Owner	BREEAM Criteria: 1) For tenanted areas (where the future occupant is not known), prior to full fit-out works, new interior finishes (including carpets, other floor finishes, ceiling finishes and any other interior finishes) have been installed in a show area only. 2) In a building being refurbished or fitted out for a specific occupant, that occupant has selected (or agreed to) the specified interior finishes. Design Stage Evidence: - Letter of Commitment



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- Design stage drawings Post Construction Stage Evidence: - 'As built' drawings - Letter of Confirmation
Wst 5 – Adaptability to Climate Change						
Wst 5	Adaptability to Climate Change	1	1	0.91%	Architect / Structural Engineer	BREEAM Criteria: 1) Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of Concept Design (RIBA Stage 2 or equivalent), in accordance with the following approach: 2) Carry out a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages: • Hazard identification • Hazard assessment • Risk estimation • Risk evaluation • Risk management. Design Stage Evidence: - Copy of the climate change adaptation strategy appraisal, developed during Concept Design (RIBA Stage 2), which identifies the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle, and covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects in line with the BREEAM methodology. Post Construction Stage Evidence: - As per Design Stage.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue	Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Wst 6 – Functional Adaptability					
Wst 6	Functional Adaptability	1	1	0.91%	Architect / Structural Engineer
BREEAM Criteria: 1) A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design (RIBA Stage 2 or equivalent), which includes recommendations for measures to be incorporated to facilitate future adaptation. 2) Functional adaptation measures (see examples in Table 69) have been adopted in the design by Technical Design stage (RIBA Stage 4 or equivalent) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor. Design Stage Evidence: - Disassembly and functional adaptability study, implementation plan report, building adaptability and disassembly guide. Post Construction Stage Evidence: - As per Design Stage.					
Land Use and Ecology					
LE 2 – Protection of Ecological Features					
Le 2	Protection of Ecological Features	N/A	N/A	N/A	Ecologist / Design Team
Credit Not Applicable BREEAM Criteria: 1) All existing features of ecological value (see Relevant definitions) within and surrounding the refurbishment or fit-out zone and site boundary area are adequately protected from damage during clearance, site preparation and refurbishment or fit-out activities in line with BS42020:20131. 2) In all cases, the principal contractor is required to construct ecological protection recommended by the Suitably Qualified Ecologist (SQE), prior to any preliminary site refurbishment or fit-out or preparation works(e.g. erection of temporary site facilities).					



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
LE 4 – Enhancing Site Ecology						
Le 4	Ecologists Report and Recommendations	N/A	N/A	N/A	Ecologist / Design Team	Credit Not Applicable BREEAM Criteria: 1) A suitably qualified ecologist (SQE) has been appointed by the client or their project representative by the end of the Preparation and Brief stage (RIBA Stage 1 or equivalent) to advise on enhancing the ecology of the site at an early stage. 2) The SQE has provided an Ecology Report with appropriate recommendations for the enhancement of the site's ecology at Concept Design stage (RIBA Stage 2 or equivalent). The report is based on a site visit/survey by the SQE (see also CN6).
LE 5 - Long Term Impact on Biodiversity						
Le 5	Long Term Impact on Biodiversity	N/A	N/A	N/A	Ecologist/ Design Team	Credit Not Applicable BREEAM Criteria: 1) Where a Suitably Qualified Ecologist (SQE) is appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the refurbishment or fit-out process. 2) Where a landscape and habitat management plan, appropriate to the site, is produced covering at least the first five years after project completion in accordance with BS42020:20131 Section 11.1. This is to be handed over to the building owner/occupants for use by the grounds maintenance staff. 3) Where additional measures to improve the assessed site's long term biodiversity are adopted, according to Table 70 .



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Pollution						
Pol 1 – Impact of Refrigerants						
Pol 1	Pre-Requisite	Pre-Req	Pre-Req	-	M&E	BREEAM Criteria: All systems with electric compressors comply with the requirements of BS EN 378:2016(204) and BS EN 378-2: 2016. Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract confirming that all refrigeration systems (with electric compressors) comply with the requirements of BS EN 378: 20016 (parts 2 and 3) and where refrigeration systems containing ammonia are specified, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice. Post Construction Stage Evidence: - Formal letter confirming that there have been no changes since the design stage. - BREEAM assessor's site inspection.
Pol 1a	Impact of Refrigerants	3	2	1.12%	M&E	BREEAM Criteria: <u>Three Credits</u> No refrigerant within the installed plant or systems. <u>Two Credits</u> The direct effect life cycle CO₂ equivalent emissions (DELCO) of ≤100 CO₂-eq/kW. OR All refrigerants used have a global warming potential (GWP) ≤10.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						One Credit Systems using refrigerants have a DELC of $\leq 1000\text{kgCO}_2\text{-eq/kW}$ cooling and heating capacity. Design Stage Evidence: - Completed copy of the Pol 01 Calculator tool. - Documentary evidence supporting the data used to complete the calculator tool. Post Construction Stage Evidence: - As per interim design stage.
Pol 1b	Leak Detection	1	1	1.12%	M&E	BREEAM Criteria: 1) Where systems using refrigerants have a permanent automated refrigerant leak detection system installed; OR where an inbuilt automated diagnostic procedure for detecting leakage is installed. In all instances a robust and tested refrigerant leak detection system must be installed and must be capable of continuously monitoring for leaks. 2) The system must be capable of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident (see Other information). Design Stage Evidence: - Completed copy of the Pol 01 Calculator tool. - Documentary evidence supporting the data used to complete the calculator tool. Post Construction Stage Evidence: - As per interim design stage.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue	Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Pol 2 – Local Air Quality					
Pol 2	Local Air Quality	3	1	1.12%	M&E
BREEAM Criteria: 1) Where the plant installed to meet the building's delivered heating and hot water demand has, under normal operating conditions, a NOx emission level (measured on a dry basis at 0% excess O2) as follows: - <100 mg/kWh – 1 credit - <70 mg/kWh – 2 credits - <40 mg/kWh – 3 credits Where heating is provided by heat pumps (fully electric) there is a formula to be used to confirm the NOx emission levels. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract confirming that all heating and hot water is supplied by non-combustion systems, or emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels. Post Construction Stage Evidence: - Formal letter confirming that there have been no changes since the design stage. - BREEAM assessor's site inspection.					
Pol 3 Surface Water Run-Off					
Pol 3a	Flood Risk	2	2	1.12%	Flood Risk Specialist
BREEAM Criteria: <u>Low Flood Risk</u> 1) Where flood maps from the appropriate statutory body (see Relevant definitions) confirm the refurbishment or fit-out is situated in a flood zone that is defined as having a low annual probability of flooding; OR 2) The project meets the requirements for avoidance of flooding in					



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						accordance with Checklist 1, (see Checklists and tables), e.g. where the refurbishment or fit-out zone is of a floor level that is 0.3m higher than the obtained/estimated flood level and safe access/escape routes are available/present. <u>Medium or High Flood Risk</u> 1) Where flood maps from the appropriate statutory body (see Relevant definitions) confirm the site has a medium or high flood risk and a site specific Flood Risk Assessment (FRA) has been undertaken (as relevant to size of project in accordance with CN7). The FRA must take all current and future sources of flooding into consideration in accordance with compliance note. 2) Where the refurbishment or fit-out zone achieves avoidance from flooding through either: a. The refurbishment and fit-out zone is located entirely on the first floor or above and a flood emergency plan has been developed in accordance with 'Would your business stay afloat?' A Guide to preparing your business for flooding', Environment Agency, 2011. OR b. As a result of the building's floor level or measures to keep water away, the building is defined as achieving avoidance from flooding by following Checklist 1, Checklists and tables. 3) Where avoidance is not possible, two credits are achieved where a full flood resilience/resistance strategy is implemented for the building's scope of works in accordance with recommendations made by a Suitably Qualified Building Professional (see Relevant definitions).



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Flood Maps - Flood Risk Assessment Post Construction Stage Evidence: - Formal letter confirming that there have been no changes to the flood risk associated with the development site.
Pol 3b	Surface Water Run-off (Neutral Impact)	1	1	1.12%	Drainage Consultant	BREEAM Criteria: 1) There is no increase in the impermeable surfaces as a result of the refurbishment works; OR 2) If there is an increase in the impermeable surface as a result of the refurbishment works then the following must be met: a. Hard standing areas- where there is an extension or increase in the hardstanding areas and hence an increase in the total impermeable area as a result of the refurbishment works, the hardstanding area must be permeable or be provided with on-site SuDS to allow full infiltration of the additional volume, to achieve the same end result. The permeable hardstanding must include all pavements and public rights of way, car parks, driveways and non-adoptable roads, but exclude footpaths that cross soft landscaped areas which will drain onto a naturally permeable surface. b. Building extension - where there is an increase in building footprint, extending onto any previously permeable surfaces, the additional run-off caused by the area of the new extension must be managed on-site using an appropriate SuDS technique for rainfall depths up to 5mm. Design Stage Evidence: - Calculation results for the pre and post-development peak rate of run-off.



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Post Construction Stage Evidence: - Formal letter confirming that the drainage solutions assessed at the design stage have been implemented. - 'As built' drawings showing the impermeable areas pre and post development.
Pol 3c	Surface Water Run-Off (Reducing Run-Off)	1	1	1.12%	Drainage Consultant	BREEAM Criteria: 1) An Appropriate Consultant has been used to design an appropriate drainage strategy for the site. 2) Either of the following criteria are met: a. There is a decrease in the impermeable area by 50% or more, from the pre-existing impermeable hard surfaces; OR b. Where run-off as a result of the refurbishment is managed on-site using source control achieving the following requirements: i. The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event has been reduced by 50% from the existing site. ii. The total volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration has been reduced by 50%. iii. An allowance for climate change must be included for all of the above calculations; this should be made in accordance with current best practice planning guidance. Design Stage Evidence: - Drainage Report Post Construction Stage Evidence: - Formal letter confirming that the drainage solutions assessed at the design stage have been implemented.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
Pol 3d	Minimising Watercourse Pollution	1	1	1.12%	Drainage Consultant	BREEAM Criteria: 1) There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant). 2) Where suitable pollution prevention measures are put in place (or already exist) for the different sources of pollution present on the assessed site, in accordance with compliance note CN20. 3) A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. 4) Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. Design Stage Evidence: - Drainage Report Post Construction Stage Evidence: - Formal letter confirming that the drainage solutions assessed at the design stage have been implemented.
Pol 4 – Reduction of Night-time Light Pollution						
Pol 4	Reduction of Night-time Light Pollution	1	1	1.12%	M&E	BREEAM Criteria: 1) External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users. OR; 2) The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011. 3) All external lighting (except for safety and security lighting) can be



Project: 17 Quay Street, Manchester
 Project No: 2022.029
 Date: 19th April 2022
 Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						automatically switched off between 23:00 and 07:00. 4) If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. 5) Where specified, illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements. Design Stage Evidence: - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming that all external lighting has been designed out of the development, or has been designed in compliance with Table 2 of the ILP Guidance notes for the reduction of obtrusive light, 2011 and all external lighting is automatically switched off between 23.00 and 07.00, except where safety and security lighting is provided and will be used between 23.00 and 07.00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP Guidance notes (or provides these lower levels at all times). - Formal written confirmation that there are no illuminated advertisements specified as part of the development. Post Construction Stage Evidence: - Formal letter confirming that the external lighting has been designed out of the development, or has been designed and installed in accordance with Table 2 of the ILP Guidance notes for the reduction of obtrusive light, 2011 and that all external lighting will automatically be switched off during 07.00hr and 23.00hr, excepting safety and security lighting that will switch to the lower levels of lighting recommended during these hours. - Formal letter confirming that there are no illuminated advertisements installed. - 'As built' drawing showing the installed external light fittings, photocell and time clock, in line with the design stage specification.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						- BREEAM assessor's site inspection.
Pol 5 – Noise Attenuation						
Pol 5	Noise Attenuation	1	1	1.12%	Acoustician/M&E	BREEAM Criteria: 1) There are no noise-sensitive areas within the assessed building or within 800 m radius of the assessed site. OR; 2) Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS 7445 is commissioned. Noise levels must be measured or determined for: - Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar. The existing background noise levels shall not include existing plant associated with the assessed building. - The rating noise level resulting from the new noise source. 3) The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body. 4) The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise sensitive development, is a difference no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level. 5) Where the noise source(s) from the proposed site/building is greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with criterion 4.



Project: 17 Quay Street, Manchester
Project No: 2022.029
Date: 19th April 2022
Revision: 1.0

BREEAM 2014 Refurbishment and Fit Out (RFO)

Issue		Available Credits	Targeted Credits	Credit Weighting (%)	Responsibility	BREEAM Criteria
						Design Stage Evidence: - Design drawings highlighting: a. All existing and proposed noise-sensitive buildings local to, and within, the site boundary b. Proposed sources of noise from the new development c. Distance (m) from these buildings to the assessed development. - Acousticians report confirming the existing background noise levels, measured in accordance with BS 7445 for both daytime and night time, and noise levels from the assessed building, as measured in the locality of the nearest or most exposed noise sensitive development, which are at least 5dB lower than the background noise throughout the day and night. - Marked-up design plan highlighting the specification of the acousticians attenuation measures. - Evidence to confirm that the acoustician is 'suitably qualified' in line with the BREEAM definition. - Relevant sections/clauses of the building specification/contract and/or a formal letter confirming the requirement for a 'suitably qualified acoustician' to be appointed to carry out a noise impact assessment in compliance with BS 7445, with any recommended attenuation measures installed. Post Construction Stage Evidence: - Evidence that testing results based on as-installed and operating plant, confirm that post completion noise levels do not exceed the recommended limits for both daytime and night time and, where applicable, a formal letter to confirm the measures taken to reduce the levels to within the required limits.



APPENDIX A – RIBA STAGE CREDITS

RIBA Sensitive Credits

There are a number of BREEAM credits that need to be addressed at particular RIBA Stage. These credits have been highlighted within Table 1.3 below.

Table 1.3 – RIBA Sensitive Credits

RIBA Stage 2 – Concept Design
Man 1a – Stakeholder Consultation (Project Delivery)
Man 1b - Stakeholder Consultation (Third Party)
Man 1c – Sustainability Champion (Design)
Man 1d – Sustainability Champion (Monitoring Progress)
Man 2a – Elemental Life Cycle Costing
Hea 04a – Thermal Modelling
Hea 04b – Adaptability – for a projected climate change scenario
Hea 04c – Thermal Zoning and Controls
Hea 06 – Safety and Security
Ene 4a – Passive Design Analysis
Ene 4b – Low and Zero Carbon Feasibility Study
Tra 5 –Travel Plan
Mat 06 – Material Efficiency
Wst 01a – Pre-Refurbishment Audit
Wst 5 – Adaptation to Climate Change
Wst 06a – Functional Adaptability
RIBA Stage 3 – Developed Design
N/A

RIBA Stage 4 – Technical Design
Man 2b – Component Life Cycle Costing
Wst 6b – Functional Adaptability
RIBA Stage 5 – Manufacturing and Construction
Man 3b – Sustainability Champion (Construction)

Appendix B – Existing BRUKL



Project name

17 Quay Street - Existing Run

As designed

Date: Thu Sep 29 18:03:34 2022

Administrative information

Building Details

Address: 17 Quay Street - Existing Run , Manchester, M3
3HN

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.17

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.17

BRUKL compliance check version: v5.6.b.0

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

The building does not comply with England Building Regulations Part L 2013

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	13.4
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	13.4
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	24
Are emissions from the building less than or equal to the target?	BER > TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.51	0.51	ST000000:Surf[9]
Floor	0.25	0.45	0.45	BN000000:Surf[0]
Roof	0.25	0.45	0.45	SF00000A:Surf[0]
Windows***, roof windows, and rooflights	2.2	3.15	3.15	ST000000:Surf[1]
Personnel doors	2.2	1.6	1.6	GF000001:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* There might be more than one surface where the maximum U-value occurs. ** 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. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	25

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Viessmann Vitrocrossal 200

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.89	-	0.2	-	-
Standard value	0.91*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

2- Viessmann Vitrocrossal 200 FCU

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.89	-	0.2	-	0.6
Standard value	0.91*	N/A	N/A	N/A	0.6
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

3- DX Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	3.5	-	-	-
Standard value	2.5*	3.2	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					

"No HWS in project, or hot water is provided by HVAC system"

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
GF Cafe	-	-	-	1.1	-	-	-	-	-	-	-	N/A
GF Retail Unit	-	-	-	1.1	-	-	-	-	-	-	-	N/A
GF Meeting Room	-	-	-	1.1	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard	
GF Meeting Room	-	-	-	1.1	-	-	-	-	-	-	N/A	
GF Lobby	-	-	-	1.1	-	-	-	-	-	-	N/A	
GF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
GF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
GF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
GF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
FF Office Unit 1	-	-	-	1.1	-	-	-	-	-	-	N/A	
FF Office Unit 2	-	-	-	1.1	-	-	-	-	-	-	N/A	
FF Office Unit 3	-	-	-	1.1	-	-	-	-	-	-	N/A	
FF Office Unit 4	-	-	-	1.1	-	-	-	-	-	-	N/A	
FF Lobby	-	-	-	1.1	-	-	-	-	-	-	N/A	
FF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
FF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
SF Office	-	-	-	1.1	-	-	-	-	-	-	N/A	
SF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
SF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
TF Office	-	-	-	1.1	-	-	-	-	-	-	N/A	
TF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
TF WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
4th WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
4th WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
4th Office	-	-	-	1.1	-	-	-	-	-	-	N/A	
5th WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
5th WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT Showers	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT Showers	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT Showers	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT Showers	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT Locker Room	-	-	0.5	-	-	-	-	-	-	-	N/A	
BSMT Locker Room	-	-	0.5	-	-	-	-	-	-	-	N/A	
GF Reception	-	-	-	1.1	-	-	-	-	-	-	N/A	

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
Standard value		60	60	22	
GF Bin Store		40	-	-	68
GF Stairs		-	40	-	119
GF Store		40	-	-	38
GF Store		40	-	-	20
GF Circulation		-	40	-	122
GF Cafe		-	40	-	1059

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
GF Retail Unit		-	40	100	9683
GF Stair		-	40	-	187
GF Meeting Room		40	-	-	678
GF Meeting Room		40	-	-	372
GF Lobby		-	40	100	1248
GF WC		-	40	-	84
GF WC		-	40	-	84
GF WC		-	40	-	84
GF WC		-	40	-	103
GF Circulation		-	40	-	79
GF Stairs		-	40	-	77
GF Store		40	-	-	29
GF Circulation		-	40	-	87
FF Office Unit 1		40	-	-	2247
FF Office Unit 2		40	-	-	5263
FF Stairs		-	40	-	118
FF Circulation		-	40	-	119
FF Store		40	-	-	38
FF Office Unit 3		40	-	-	4209
FF Office Unit 4		40	-	-	2799
FF Lobby		-	40	-	358
FF Stairs		-	40	-	132
FF Store		40	-	-	37
FF WC		-	40	-	340
FF WC		-	40	-	89
FF Circulation		-	40	-	69
SF Office		40	-	-	15770
SF Stairs		-	40	-	118
SF Store		40	-	-	38
SF Store		40	-	-	27
SF Circulation		-	40	-	70
SF Store		40	-	-	37
SF WC		-	40	-	341
SF WC		-	40	-	89
SF Stairs		-	40	-	132
SF Circulation		-	40	-	69
TF Office		40	-	-	15770
TF Stairs		-	40	-	118
TF Store		40	-	-	38
TF Store		40	-	-	27
TF Circulation		-	40	-	70
TF Store		40	-	-	37
TF WC		-	40	-	341

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
TF WC		-	40	-	89
TF Stairs		-	40	-	132
TF Circulation		-	40	-	69
4th WC		-	40	-	341
4th Store		40	-	-	37
4th WC		-	40	-	89
4th Stairs		-	40	-	132
4th Circulation		-	40	-	69
4th Store		40	-	-	38
4th Store		40	-	-	27
4th Circulation		-	40	-	70
4th Stairs		-	40	-	118
4th Office		40	-	-	13771
5th WC		-	40	-	341
5th Store		40	-	-	37
5th WC		-	40	-	89
5th Stairs		-	40	-	132
5th Circulation		-	40	-	69
5th Store		40	-	-	38
5th Store		40	-	-	27
5th Circulation		-	40	-	70
5th Stairs		-	40	-	118
5th Office		40	-	-	13771
BSMT WC		-	40	-	105
BSMT WC		-	40	-	105
BSMT Showers		-	40	-	21
BSMT Showers		-	40	-	21
BSMT Showers		-	40	-	21
BSMT Showers		-	40	-	20
BSMT Plant		40	-	-	190
BSMT Plant		40	-	-	49
BSMT Plant		40	-	-	121
BSMT Plant		40	-	-	160
BSMT Plant		40	-	-	124
BSMT Plant		40	-	-	175
BSMT Plant		40	-	-	79
BSMT Locker Room		-	40	-	160
BSMT Locker Room		-	40	-	239
BSMT Drying Room		40	-	-	187
BSMT Circulation		-	40	-	224
BSMT Circulation		-	40	-	36
BSMT Stairs		-	40	-	85
BSMT Store		40	-	-	48

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
BSMT Store		40	-	-	23
BSMT Stairs		-	40	-	72
BSMT Comms Room		40	-	-	135
Roof Stairs		-	40	-	107
Roof Circulation		-	40	-	64
Roof Stairs		-	40	-	124
Roof Circulation		-	40	-	79
Roof Plant		40	-	-	466
GF Reception		-	40	100	959

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF Cafe	NO (-56.3%)	NO
GF Retail Unit	NO (-31.5%)	NO
GF Meeting Room	NO (-68.4%)	NO
GF Meeting Room	NO (-29.9%)	NO
GF Lobby	N/A	N/A
FF Office Unit 1	NO (-33.8%)	NO
FF Office Unit 2	NO (-25.3%)	NO
FF Office Unit 3	NO (-25.2%)	NO
FF Office Unit 4	NO (-27.1%)	NO
SF Office	NO (-38.3%)	NO
TF Office	NO (-38.3%)	NO
4th Office	NO (-8.1%)	NO
5th Office	NO (-4.8%)	NO
BSMT Comms Room	N/A	N/A
GF Reception	NO (-31.4%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	7370.3	7370.3
External area [m ²]	5667.8	5667.8
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	25	3
Average conductance [W/K]	5556.39	2810.31
Average U-value [W/m ² K]	0.98	0.5
Alpha value* [%]	10.08	10

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

Building Use

% Area	Building Type
6	A1/A2 Retail/Financial and Professional services A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
94	B1 Offices and Workshop businesses B2 to B7 General Industrial and Special Industrial Groups B8 Storage or Distribution C1 Hotels C2 Residential Institutions: Hospitals and Care Homes C2 Residential Institutions: Residential schools C2 Residential Institutions: Universities and colleges C2A Secure Residential Institutions Residential spaces D1 Non-residential Institutions: Community/Day Centre D1 Non-residential Institutions: Libraries, Museums, and Galleries D1 Non-residential Institutions: Education D1 Non-residential Institutions: Primary Health Care Building D1 Non-residential Institutions: Crown and County Courts D2 General Assembly and Leisure, Night Clubs, and Theatres Others: Passenger terminals Others: Emergency services Others: Miscellaneous 24hr activities Others: Car Parks 24 hrs Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	41.95	7.45
Cooling	0	0
Auxiliary	5.14	2.53
Lighting	20.92	18.33
Hot water	6.37	5.67
Equipment*	38.97	38.97
TOTAL **	74.39	33.99

* 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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	119.95	23.12
Primary energy* [kWh/m ²]	138.97	78.47
Total emissions [kg/m ²]	24	13.4

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Single room cooling system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	0	0	0	0	0	2.33	2.49	2.5	3.5	
Notional	0	0	0	0	0	2.56	3.79	----	----	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	198.4	0	69.4	0	2.1	0.79	0	0.89	0	
Notional	55.6	0	17.9	0	1.1	0.86	0	----	----	
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
Actual	85.5	0	29.9	0	6.5	0.79	0	0.89	0	
Notional	8.7	0	2.8	0	3.2	0.86	0	----	----	
[ST] No Heating or Cooling										
Actual	0	0	0	0	0	0	0	0	0	
Notional	0	0	0	0	0	0	0	----	----	

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.51	ST000000:Surf[9]
Floor	0.2	0.45	BN000000:Surf[0]
Roof	0.15	0.45	SF00000A:Surf[0]
Windows, roof windows, and rooflights	1.5	3.15	ST000000:Surf[1]
Personnel doors	1.5	1.6	GF000001:Surf[2]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
U _{i-Typ} = Typical individual element U-values [W/(m²K)]		U _{i-Min} = Minimum individual element U-values [W/(m²K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	25



Project name

17 Quay Street - As Designed

As designed

Date: Fri Sep 30 08:23:11 2022

Administrative information

Building Details

Address: 17 Quay Street - As Designed , Manchester, M3
3HN

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.17

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.17

BRUKL compliance check version: v5.6.b.0

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	15
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	15
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	13
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.28	0.28	ST000000:Surf[9]
Floor	0.25	0.22	0.22	BN000000:Surf[0]
Roof	0.25	0.18	0.18	SF00000A:Surf[0]
Windows***, roof windows, and rooflights	2.2	1.6	1.6	ST000000:Surf[1]
Personnel doors	2.2	1.6	1.6	GF000001:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* There might be more than one surface where the maximum U-value occurs. ** 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. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	10

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the [Non-Domestic Building Services Compliance Guide](#) for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Panel Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- VRF

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	4	0	-	0.7
Standard value	2.5*	2.6	N/A	N/A	0.65
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

3- ASHP

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	3	0	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

4- DX Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	3.5	-	-	-
Standard value	2.5*	3.2	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- HW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.55	0.005
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
GF Cafe		-	-	-	1.1	-	-	-	-	-	-	N/A
GF Meeting Room		-	-	-	1.1	-	-	-	-	-	-	N/A
GF Meeting Room		-	-	-	1.1	-	-	-	-	-	-	N/A
GF Lobby		-	-	-	1.1	-	-	-	-	-	-	N/A
GF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
GF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
GF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
GF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
FF Office Unit 1		-	-	-	1.1	-	-	-	-	-	-	N/A
FF Office Unit 2		-	-	-	1.1	-	-	-	-	-	-	N/A
FF Office Unit 3		-	-	-	1.1	-	-	-	-	-	-	N/A
FF Office Unit 4		-	-	-	1.1	-	-	-	-	-	-	N/A
FF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
FF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
SF Office		-	-	-	1.1	-	-	-	-	-	-	N/A
SF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
SF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
TF Office		-	-	-	1.1	-	-	-	-	-	-	N/A
TF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
TF WC		-	-	0.5	-	-	-	-	-	-	-	N/A
4th WC		-	-	0.5	-	-	-	-	-	-	-	N/A
4th WC		-	-	0.5	-	-	-	-	-	-	-	N/A
4th Office		-	-	-	1.1	-	-	-	-	-	-	N/A
5th WC		-	-	0.5	-	-	-	-	-	-	-	N/A
5th WC		-	-	0.5	-	-	-	-	-	-	-	N/A
5th Office		-	-	-	1.1	-	-	-	-	-	-	N/A
BSMT WC		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT WC		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT Showers		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT Showers		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT Showers		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT Showers		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT Locker Room		-	-	0.5	-	-	-	-	-	-	-	N/A
BSMT Locker Room		-	-	0.5	-	-	-	-	-	-	-	N/A
GF Reception		-	-	-	1.1	-	-	-	-	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
GF Bin Store		100	-	-	27
GF Stairs		-	100	-	48
GF Store		100	-	-	15
GF Store		100	-	-	8

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
GF Circulation		-	100	-	49
GF Cafe		-	100	-	424
GF Retail Unit		-	100	100	3873
GF Stair		-	100	-	75
GF Meeting Room		100	-	-	271
GF Meeting Room		100	-	-	149
GF Lobby		-	100	100	499
GF WC		-	100	-	34
GF WC		-	100	-	34
GF WC		-	100	-	34
GF WC		-	100	-	41
GF Circulation		-	100	-	32
GF Stairs		-	100	-	31
GF Store		100	-	-	12
GF Circulation		-	100	-	35
FF Office Unit 1		100	-	-	899
FF Office Unit 2		100	-	-	2105
FF Stairs		-	100	-	47
FF Circulation		-	100	-	48
FF Store		100	-	-	15
FF Office Unit 3		100	-	-	1684
FF Office Unit 4		100	-	-	1119
FF Lobby		-	100	-	143
FF Stairs		-	100	-	53
FF Store		100	-	-	15
FF WC		-	100	-	136
FF WC		-	100	-	35
FF Circulation		-	100	-	27
SF Office		100	-	-	6308
SF Stairs		-	100	-	47
SF Store		100	-	-	15
SF Store		100	-	-	11
SF Circulation		-	100	-	28
SF Store		100	-	-	15
SF WC		-	100	-	136
SF WC		-	100	-	35
SF Stairs		-	100	-	53
SF Circulation		-	100	-	27
TF Office		100	-	-	6308
TF Stairs		-	100	-	47
TF Store		100	-	-	15
TF Store		100	-	-	11
TF Circulation		-	100	-	28

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
TF Store		100	-	-	15
TF WC		-	100	-	136
TF WC		-	100	-	35
TF Stairs		-	100	-	53
TF Circulation		-	100	-	27
4th WC		-	100	-	136
4th Store		100	-	-	15
4th WC		-	100	-	35
4th Stairs		-	100	-	53
4th Circulation		-	100	-	27
4th Store		100	-	-	15
4th Store		100	-	-	11
4th Circulation		-	100	-	28
4th Stairs		-	100	-	47
4th Office		100	-	-	5509
5th WC		-	100	-	136
5th Store		100	-	-	15
5th WC		-	100	-	35
5th Stairs		-	100	-	53
5th Circulation		-	100	-	27
5th Store		100	-	-	15
5th Store		100	-	-	11
5th Circulation		-	100	-	28
5th Stairs		-	100	-	47
5th Office		100	-	-	5509
BSMT WC		-	100	-	42
BSMT WC		-	100	-	42
BSMT Showers		-	100	-	8
BSMT Showers		-	100	-	8
BSMT Showers		-	100	-	8
BSMT Showers		-	100	-	8
BSMT Plant		100	-	-	76
BSMT Plant		100	-	-	20
BSMT Plant		100	-	-	48
BSMT Plant		100	-	-	64
BSMT Plant		100	-	-	50
BSMT Plant		100	-	-	70
BSMT Plant		100	-	-	32
BSMT Locker Room		-	100	-	64
BSMT Locker Room		-	100	-	96
BSMT Drying Room		100	-	-	75
BSMT Circulation		-	100	-	90
BSMT Circulation		-	100	-	14

General lighting and display lighting		Luminous efficacy [lm/W]		
Zone name		Luminaire	Lamp	Display lamp
	Standard value	60	60	22
BSMT Stairs		-	100	-
BSMT Store		100	-	-
BSMT Store		100	-	-
BSMT Stairs		-	100	-
BSMT Comms Room		100	-	-
Roof Stairs		-	100	-
Roof Circulation		-	100	-
Roof Stairs		-	100	-
Roof Circulation		-	100	-
Roof Plant		100	-	-
GF Reception		-	100	100
				384

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF Cafe	NO (-57.6%)	NO
GF Retail Unit	NO (-33.7%)	NO
GF Meeting Room	NO (-69.5%)	NO
GF Meeting Room	NO (-32.3%)	NO
GF Lobby	N/A	N/A
FF Office Unit 1	NO (-36%)	NO
FF Office Unit 2	NO (-27.6%)	NO
FF Office Unit 3	NO (-27.5%)	NO
FF Office Unit 4	NO (-29.6%)	NO
SF Office	NO (-40.2%)	NO
TF Office	NO (-40.2%)	NO
4th Office	NO (-10.9%)	NO
5th Office	NO (-7.7%)	NO
BSMT Comms Room	N/A	N/A
GF Reception	NO (-33.7%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	7370.3	7370.3
External area [m ²]	5667.8	5667.8
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	10	3
Average conductance [W/K]	2826.82	2810.31
Average U-value [W/m ² K]	0.5	0.5
Alpha value* [%]	10.07	10

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

Building Use

% Area	Building Type
6	A1/A2 Retail/Financial and Professional services A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
94	B1 Offices and Workshop businesses B2 to B7 General Industrial and Special Industrial Groups B8 Storage or Distribution C1 Hotels C2 Residential Institutions: Hospitals and Care Homes C2 Residential Institutions: Residential schools C2 Residential Institutions: Universities and colleges C2A Secure Residential Institutions Residential spaces D1 Non-residential Institutions: Community/Day Centre D1 Non-residential Institutions: Libraries, Museums, and Galleries D1 Non-residential Institutions: Education D1 Non-residential Institutions: Primary Health Care Building D1 Non-residential Institutions: Crown and County Courts D2 General Assembly and Leisure, Night Clubs, and Theatres Others: Passenger terminals Others: Emergency services Others: Miscellaneous 24hr activities Others: Car Parks 24 hrs Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	7.15	4.05
Cooling	3.51	4.81
Auxiliary	3.28	1.62
Lighting	8.8	18.33
Hot water	2.22	1.91
Equipment*	38.97	38.97
TOTAL **	24.96	30.72

* 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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	75.7	84.29
Primary energy* [kWh/m ²]	76.63	86.19
Total emissions [kg/m ²]	13	15

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	30	43	2.2	4.2	4.3	3.73	2.84	4	4	
Notional	11.4	79.9	1.2	5.9	2.1	2.56	3.79	----	----	
[ST] Single room cooling system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	0	0	0	0	0	2.33	2.49	2.5	3.5	
Notional	0	0	0	0	0	2.56	3.79	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	86.2	0	29.9	0	0.3	0.8	0	1	0	
Notional	56.4	0	18.2	0	0.4	0.86	0	----	----	
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	66.3	47.8	7.9	6.2	0	2.33	2.13	2.5	3	
Notional	12.5	100.7	1.4	7.4	0	2.56	3.79	----	----	
[ST] No Heating or Cooling										
Actual	0	0	0	0	0	0	0	0	0	
Notional	0	0	0	0	0	0	0	----	----	

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.28	ST000000:Surf[9]
Floor	0.2	0.22	BN000000:Surf[0]
Roof	0.15	0.18	SF00000A:Surf[0]
Windows, roof windows, and rooflights	1.5	1.6	ST000000:Surf[1]
Personnel doors	1.5	1.6	GF000001:Surf[2]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
U _{i-Typ} = Typical individual element U-values [W/(m²K)]		U _{i-Min} = Minimum individual element U-values [W/(m²K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	10