
Manchester College City Centre Campus, Phase 1

Environmental Standards Statement (Post Construction Stage Response)

Date: June 2022

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P01	Issue	Niall Johnston	28/06/2022	Kat Radford	28/06/2022

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1. Introduction

BDP have been appointed to undertake a review of the Environmental Statement, provided as part of the Planning submission in 2019, and As Built building information (including a site visit) to confirm whether the commitments made within the submission relevant to energy efficiency and sustainable design have been adhered to.

The Environmental Statement addressed the requirements of 'A Guide to Development in Manchester and Manchester's Core Strategy (adopted 2012)', to demonstrate how the proposals would comply with the environmental standards set out in terms of energy efficiency, renewable energy and environmental design. The report further demonstrated how the scheme would meet the minimum target CO₂ reductions from low or zero carbon energy supplies, as set out in the adopted Core Strategy.

A separate Energy Statement detailing the energy saving and efficiency measures incorporated within the development was also provided as part of the Planning submission. A summary of the key points is presented within this statement.

2. Planning Policy and Drivers

This Environmental Standards Statement seeks to respond to Manchester's local planning policy, in addition to wider national planning policies within the National Planning Policy Framework 2019 (NPPF 2019), noting that this was the current Framework at the time of submission.

Manchester's current planning policy, in respect of environmental standards, is set out within the Core Strategy 2012 – 2027 (adopted on 11th July 2012). The Strategy is supported by the Supplementary Planning Document (SPD) "*Guide to Development in Manchester*" (adopted 2007). Section 4 of the SPD, "Environmental Standards", provides guidance to developers on requirements and planning submission documentation to be submitted in support of planning applications in Manchester, so as to demonstrate compliance with the relevant Core Strategy planning requirements. This report responds to item 4.4 of the SPD which requires that:

"Developers will be expected to submit a statement on how their proposal will achieve the environmental standards set out in this chapter. This statement will be seen as an addition to the Design and Access Statement [...]. This additional Environmental Standards Statement will be required for all planning applications, both outline and full, with the exception of changes of use where no operational work is required, house extensions and mining or engineering work."

The following planning policies, as detailed within the Core Strategy, are addressed within this Environmental Standards Statement:

- **Policy EN4 (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, being designed:
 - to reduce the need for energy through design features that provide passive heating, natural lighting and cooling
 - to reduce the need for energy through design features such as improved insulation and glazing
 - to meet residual energy requirements through the use of low or zero carbon energy generating technologies.
- Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.
- Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.
- Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy 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.

- **Policy EN6 (Target Framework for CO₂ Reduction from Low or Zero Carbon Energy Supplies)**

Applications for residential development of 10 or more units and all other development over 1,000m² will be expected as a minimum to meet the target shown in Tables 1 or 2, unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO₂ emissions for all phases of the development.

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

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

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

Table 1: Domestic CO₂ emissions reduction targets

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

Table 2: Non-domestic CO₂ emissions reduction targets

Target	% Minimum requirement
Target 1: Network development area	CHP / district heating anchor or, connection or, where not feasible, a 15% increase on Part L 2010.
Target 2: Electricity intense buildings (applies to commercial uses with a high proportion of emissions from electricity use [$>45\text{kgCO}_2/\text{m}^2$])	+10% increase on Part L 2010
Target 3: Micro generation area	+15% increase on Part L 2010

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

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

The energy statement will be required to be submitted at the outset of any proposed development (outline application or before). Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO₂ mitigation, subject to the energy statement incorporating evidence such as modelling to demonstrate compliance.

- **Policy EN8** (Adaptation to Climate Change) requires all new developments to be designed so as to be adaptable to future climate conditions in terms of the design, layout, siting and function of buildings and associated external spaces.
- **Policy EN9** (Green Infrastructure) aims to ensure that existing green infrastructure is maintained, and, where the opportunity arises, enhanced in terms of quality, quantity and functionality. Where green infrastructure is lost, this should be mitigated.
- **Policy EN14** (Flood Risk) directs developments away from sites that are at risk of flooding and encourages the use of sustainable urban drainage systems to manage surface water runoff.
- **Policy EN17** (Water Quality) seeks to avoid any adverse impact on water quality, including the construction phase, and, wherever possible, enhance water quality and minimise surface water runoff through the use of sustainable urban drainage techniques (SuDS).

- **Policy EN19 (Waste)** aims to ensure that all developments demonstrate consistency with the principals of the waste hierarchy and for construction and demolition waste to be minimised and recycled on site wherever possible.

- **Policy DM1 (Development Management)**

All developments should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document.

- Appropriate siting, layout, scale, form, massing, materials and detail.
- Impact on the surrounding areas in terms of the design, scale and appearance of the proposed development. Development should have regard to the character of the surrounding area.
- Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions such as noise.
- Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes.
- Community safety and crime prevention.
- Design for health.
- Adequacy of internal accommodation and external amenity space.
- Refuse storage and collection.
- Vehicular access and car parking.
- Effects relating to biodiversity, landscape, archaeological or built heritage.
- Green infrastructure including open space, both public and private.
- The use of alternatives to peat-based products in landscaping/gardens within development schemes.
- Flood risk and drainage.
- Existing or proposed hazardous installations.
- Subject to scheme viability, developers will be required to demonstrate that new development incorporates sustainable construction techniques as follows (In terms of energy targets this policy should be read alongside policy EN6 and the higher target will apply):-
 - a) For new residential development (note that the requirement to meet Code for Sustainable homes targets has been removed from planning policy)
 - b) For new commercial developments to demonstrate best practice which will include the application of the BREEAM (Building Research Establishment Environmental Assessment Method) standards. By 2019 provisions similar to the Code for Sustainable Homes will also apply to all non-domestic buildings.

3. Sustainability Design Response

The following section summarises the design's response, as built, to the sustainability requirements of the Manchester Core Strategy, as set out in Section 2.

3.1 Environmental Design

Manchester Core Strategy Policy DM 1 requires developers to demonstrate the incorporation of sustainable construction techniques, including the application of BREEAM standards. The development has targeted a BREEAM rating of 'Excellent' thereby exceeding the Core Strategy requirement for BREEAM 'Very Good'. At the time of writing, the BREEAM design stage assessment is under review by the BRE. The BDP BREEAM assessor has confirmed, however, that they do not foresee any risks or issues with regards to achieving Excellent certification.

Assessed under the BREEAM New Construction 2018 (Higher Education) scheme, a final score of >70% is anticipated (the interim score is anticipated to be 79.12%), exceeding the minimum 70% requirement for BREEAM Excellent. A breakdown of the credits and issues targeted for BREEAM 'Excellent' is summarised in Figure 1 and Table 3. For the full strategy, including details of each credit, please refer to the BREEAM tracker in Appendix 1 of this report.

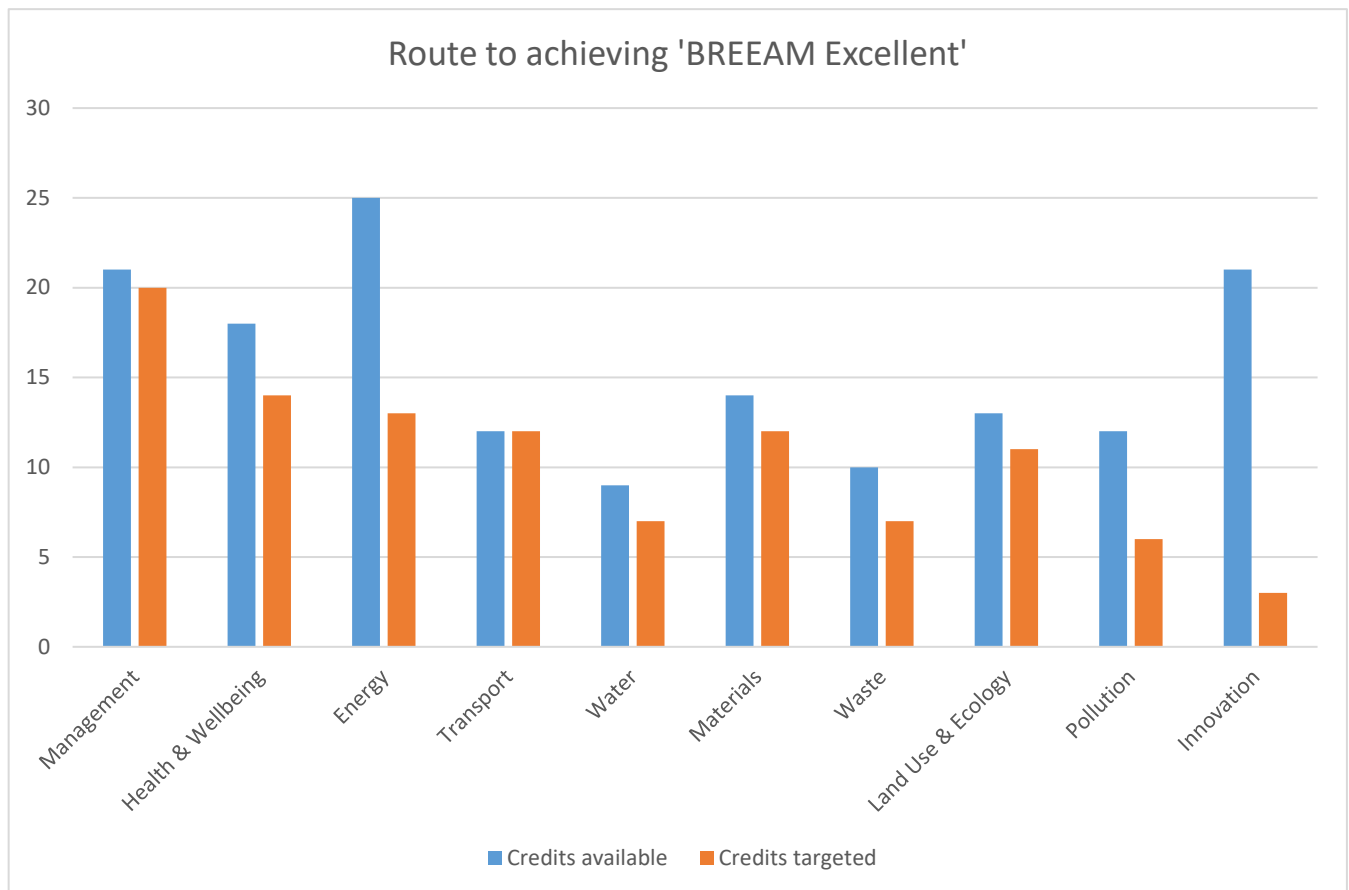


Figure 1: Route to 'Excellent'

Table 3: Route to 'Excellent'

Environmental section	No. credits available	Indicative no. credits achieved	% Credits achieved	Section weighting	Indicative section score
Management	21	20	95.20%	11.0%	10.48%
Health and Wellbeing	18	14	77.80%	14.0%	10.89%
Energy	25	13	52.00%	16.0%	8.32%
Transport	12	12	100%	10.0%	10.0%
Water	9	7	77.78%	7.0%	5.44%
Materials	14	11	78.60%	15.0%	11.8%
Waste	10	7	70.00%	6.0%	4.20%
Land Use and Ecology	13	11	84.60%	13.0%	11.00%
Pollution	13	6	50.00%	8.0%	4.00%
Innovation	21	3	14.30%	10.00%	3.00%
TOTAL:					79.12%

Despite limited external space, the development scores highly under the ecology section for improving ecological value and opportunities for urban wildlife, e.g., through bird and bat boxes and wildflower planting in the small outdoor area to the rear of the site.

Most of the management credits have also been achieved because of project and contractor management processes relating to sustainability, the use of lifecycle costing exercises to inform the design, and the use of Sustainability Champions in both the design and construction teams to ensure sustainability features targeted in the early stages are realised in the final build.

Furthermore, due to its location and opportunities for improving and encouraging sustainable transport, e.g., improving the pedestrian crossing outside the site and providing cycle storage spaces and cyclist facilities, the site achieved the maximum credits available in the transport section. Low water consuming sanitaryware and kitchen taps as well as water metering, sub metering and leak control further allowed the project to achieve the majority of the water category credits.

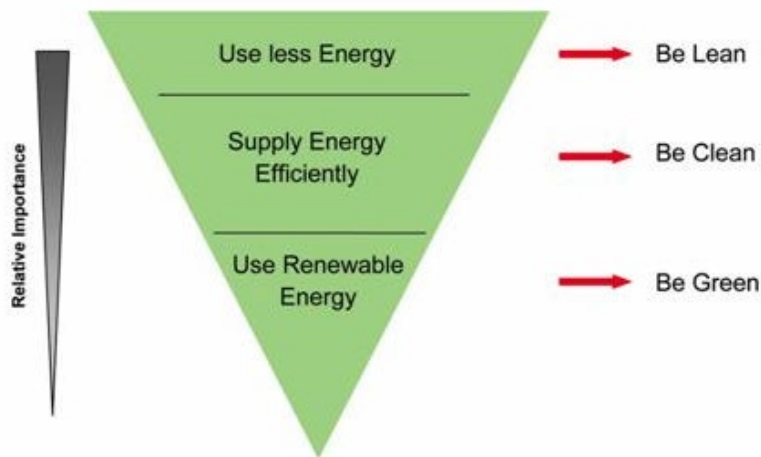
The site is located in Flood Risk Zone 2, thus impacting the score for the pollution category. This, however, has not hindered the ability to deliver a BREEAM Excellent and energy efficient development.

Whilst the BRE are undertaking their audit of the design stage assessment, the team have commenced with the final post construction assessment, required for final certification. Following the information received to date and the BREEAM assessor site visit / inspection, BDP do not foresee any risks with regards to the design and not achieving BREEAM Excellent.

3.2 Energy efficiency measures and Renewable Energy

Compliance with Manchester Core Strategy Policies EN4, EN5, EN6 and EN7 were addressed in the Energy Statement prepared by BDP as part of the Planning application (Appendix 2). As required by Policy EN4, the project has implemented the energy hierarchy to ensure that energy efficiency is maximised, carbon emissions reduced, and low and zero carbon technologies utilised, whilst concurrently ensuring that running and maintenance costs are minimised throughout the building lifecycle. The hierarchy is split into three stages:

- Be Lean (reduce energy demand)
- Be Clean (supply energy efficiently)
- Be Green (reduce carbon emissions further through the use of low and zero carbon technologies)



In line with Policy EN6 (Target Framework for CO₂ Reduction from Low or Zero Carbon Energy Supplies), implementation of the energy hierarchy has resulted in a 33.02% reduction in building emissions. Policy EN6 requires new developments to achieve a minimum 15% reduction in emissions over Part L 2010. Since the issue of the Core Strategy, Part L 2010 has been superseded by Part L 2013, noting that the energy requirements for Part L 2013 are more stringent. The 15% requirement translates as a 6% improvement over Part L 2013. As per the details in the As Built BRUKL report, the target CO₂ emission rate (TER) of 21.2 kgCO₂/m².annum is bettered by 33.02% with a building CO₂ emission rate of 14.2 kgCO₂/m².annum, thereby exceeding the requirements of Policy EN6.

A summary of the approach, confirmed to represent the energy strategy as per the As Built design, is summarised in the following sections.

3.2.1 Be Lean

The As Built BRUKL / Part L report (provided separately to this report), confirms the development exceeds the minimum building fabric U-values and air permeability targets over those required for compliance with Building Regulations AD Part L 2013, as outlined in Table 4, thereby exceeding Building Regulations compliance and minimising energy demand. The energy strategy has therefore adhered to the first requirement of the hierarchy; to reduce the need for energy through design features that provide passive heating, natural lighting and cooling.

3.2.2 Be Clean

The systems listed in Table 5 have been delivered within the final design to minimise consumption and contribute further towards reducing emissions. The systems remain unchanged from the proposals stated in the original planning statement

3.2.3 Be Green

As well as adhering with policy EN6, this is also the final step of the energy hierarchy which involves the consideration of low and zero carbon technologies to offset carbon emissions further. The development incorporates renewable energy conversion technologies (ASHPs and solar PV).

Table 4: As Built building performance

Description	Part L minimum	Planning Specification	As Built Specification	Performance Relative to Part L Requirement
External Wall U-Value	0.35 W/m ² .K area-weighted average	0.18 W/m ²	0.15 W/m ²	Improvement
Ground Floor U-Value	0.25 W/m ² .K area-weighted average	0.13 W/m ²	0.15 W/m ²	Improvement
Roof U-Value	0.25 W/m ² .K area-weighted average	0.16 W/m ²	0.15 W/m ²	Improvement
Window, roof windows, and rooflights U-Value	2.2 W/m ² .K area-weighted average	1.31 W/m ²	1.18 W/m ²	Improvement
Personnel doors	2.2 W/m ² .K area-weighted average	-	1.93 W/m ²	Improvement
High usage entrance doors	3.5 W/m ² .K area-weighted average	-	1.27 W/m ²	Improvement
Building Air Permeability	10 m ³ /(h.m ²) @ 50 Pa	3 m ³ /(h/m ²) @50 Pa.	4.55 m ³ /(h/m ²) @50 Pa.	Improvement

Table 5: Building systems specification

Description	System
Ventilation	Central air handling plant with heat recovery >75%, air source heat pumps and fans with low SFP <1.8w/l/s
Main Heating	Central gas fired condensing boilers
Emitters	Radiators, radiant panels, fan coil units, over door heaters, heater batteries.
Controls	Automatic controls linked to central BMS to monitor energy and meter consumption
Hot Water	Plate heat exchangers off the central boilers feeding hot water storage vessels with local point of use heaters in remote points of the system
Secondary Heating	VRF air source heat pumps where cooling loads are also present in the spaces
Renewable Energy	Air source heat pumps, Photovoltaic cells
Lighting	LED with absence / presence detection controls. Daylight dimming where applicable.

3.4 Transport

In line with the travel plan provided as part of the Planning submission (travel plan report ref: 170911), and requirements of the Planning approval, the following sustainable transport measures have been provided:

- 112 cycle spaces in a covered and secure location on the site. These stands are for use as long-stay cycle storage for staff and students.
- 4 Sheffield stands (8 spaces) outside the building for short stay use.
- The site is car-free, with only accessible parking bays provided.
- Of the six accessible parking spaces, two are provided with EV charging points.

The travel plan for the development proposed the following measures:

- Walking
 - Provide legible and well maintained pedestrian access routes at all campuses
 - Provide information on safe walking routes around campuses and between key destinations
- Cycling
 - Enhanced cycle storage facilities with the provision of 2 showers, lockers and changing areas.
 - Audit availability of staff lockers and changing facilities at each campus
 - Promote safe cycle routes
- Public transport
 - Provide local area public transport information at key locations on each campus
 - Promote local public transport routes

These remaining proposed transport measures will be implemented by the College.

3.5 Water Management

3.5.1 Internal water consumption

In line with the commitments made within the Planning submission, the development achieves >40% reduction (40.88%) in potable water consumption, resulting from the installation of low water consuming sanitaryware and kitchen fittings.

As part of the BREEAM assessment and as confirmed by the BREEAM assessor following their site visit, the fittings listed in Table 6 have been installed and, as such, the 3 BREEAM credits for potable water reduction >40% is achieved.

In addition to reducing water consumption, water meters are installed to the mains supply to the building, including sub-meters to plant areas and building areas that consume $\geq 10\%$ of the buildings total water demand. This will allow the facilities management team to monitor water usage and identify any areas of the building that are consuming water in excess of expected levels.

Flow control devices which regulate the supply of water to each WC area / sanitary facility according to demand (e.g., PIRs and solenoid valves) have been installed in order to minimise water leaks that may otherwise go undetected.

Table 6: Water and sanitary equipment

Item	Product	Technical details
WCS	Conceala 2 Cistern	3.38 litre effective flush volume (4.5/3 dual flush)
	Conceala cistern (Armitage Shanks Doc M Contour 21+ Ambulant Care)	6.00 litre effective flush volume
	Armitage Shanks Doc M Contour 21+ Peninsular Care Pack	4.50 litre effective flush volume
	Armitage Shanks Doc M Contour 21+ Close Coupled Pack LH&RH	4.50 litre effective flush volume
	Conceala cistern (Armitage Shanks Doc M Contour 21+ Back to Wall RH and LH)	6.00 litre effective flush volume
WHB taps	Armitage Shanks Sandringham 21	4.80 litres/min
	Armitage Shanks Doc M Contour 21+ Peninsular Care Pack	3.90 litres/min
	Armitage Shanks Portman 21+ 1-hole thermostatic basin mixer	3.90 litres/min
	Armitage Shanks Doc M Contour 21+ Back to Wall	3.90 litres/min
	Tap for Armitage Shanks Avon 21 Washbasin Mixer 1 hole	3.70 litres/min
Showers	Armitage Shanks Avon 21 Shower Valve with flow restrictor	6.00 litres/min
	Doc M Shower Room Pack - Exposed	19.00 litres/min
Urinals	Armitage Shanks Contour HygenIQ Urinal (S6218 Conceala auto cistern 13.6 litres)	Cistern capacity: 13.6 litres Flushing frequency (flushes/hour): 1.50
Kitchenette taps*	Tempo single lever kitchen mixer	5 litres/min
Kitchen taps (pre-rinse nozzles only)*	Aquajet AJPR30-ST-BF1-S	7.99 litres/min
Waste disposal unit	None provided	n/a
Commercial sized dishwashers	Winterhalter PT-M (Dishes)EnergyPlus	2.4 litres/rack
	Winterhalter UC-M (Glass)	2.4 litres/rack
Washing machines (domestic or commercial)	None provided	n/a

3.5.2 External water consumption

Due to the limited area of soft landscaping and planting provided as part of the development, it has been confirmed within the document 5255-M-DTN-020 WAT-04-01 BREEAM that watering of all vegetation will either be by hand or through precipitation. As such, no permanent irrigation systems shall be installed, thereby reducing external water consumption.

3.5.3 Flood risk and drainage strategy

As per the site-specific Flood Risk Assessment (report ref: MCCC-SHD-00-ZZ-RP-C-0001) provided for Planning, the development lies within Flood Zone 2 and therefore has between a 1 and 100 and 1 in 1000 annual probability of flooding (1%-0.1%). This is due to the surcharging of the adjacent River Irwell. The site has been assessed against the NPPF 'Sequential Test'. Taking into consideration that the application is for a College Campus in Flood Zone 2, Tables 1, 2, & 3 of the NPPF Technical Guidance have been appraised to confirm the development is 'appropriate'. There have been no changes to the information provided.

In line with the Manchester Local Flood Authority (LLFA) requirements to limit the total surface water runoff rate from the site to the local greenfield rate, and to provide onsite storage and attenuation, discharge will be limited to 5.1 l/s. The required storage volume on site for a 1:100-year attenuation + 20% Climate Change Allowance would be up to 465m³. This responds to both policies EN14 (Flood Risk) and EN17 (Water Quality).

The drainage consultants have confirmed that the details provided for Planning remain correct and that the proposed drainage measures have been installed. The surface water drainage strategy for the new development site discharges surface water into the combined sewer in Great Ducie Street. Attenuation has been installed in the form of geocellular storage. The new surface water networks are designed in line with current British Standard and Sewers for Adoption Guidance up to the 100-year storm return period including an allowance for climate change. Surface water runoff has been reduced from the pre-development regime and utilises SuDS solutions to satisfy the site constraints. Rainwater storage has been provided from the planting provided to the roof area.

3.6 Ecology and biodiversity

As Built information provided confirms that the recommendations proposed by the ecologist within their Planning submission report (ref:124995_FO_2019-ECOLOGICAL_APPRAISAL-1299529) have been implemented:

- An open fronted nest box plus an additional 3 nest boxes (mounted to the bin store and cycle parking area) have been provided to mitigate for the loss of nesting bird habitat.
- The lighting design and installation has taken into consideration the potential presence of bats passing through the site, i.e., it does not increase ambient lighting levels and overspill onto the scattered trees present north of the site is avoided.
- A bat box has been installed (mounted to louvred plant screen on the roof as per drawing ref: CC-BBA-ZZ-ZZ-DR-A-2102_BAT BOX LOCATIONS-P01).
- The landscape design has taken into account habitat enhancement, incorporating plant species that provide food or shelter resource to wildlife such as Hebe Sapphire and forest flame (ornamental planting species), Rowan trees, and Small Leaved Lime.

A biodiversity net gain of 110% has been achieved.

3.7 Construction management

3.7.1 Construction waste management

In line with the commitments made within the Environmental Statement submitted for Planning, sustainable waste management during construction has been carried out in accordance with the BREEAM Wst 01 (Construction Waste Management) requirements. This entails the principal contractor operating a BREEAM compliant resource management plan (RMP) to promote resource efficiency and prevent illegal waste activities. Resource efficiency includes minimising waste at source to ensure clients, designers and principal contractors assess the use, reuse and recycling of materials and products on the site. As part of the BREEAM assessment, BDP reviewed Willmott Dixon's RMP and confirmed that this was BREEAM compliant.

As per the BREEAM requirements and their original waste targets, Willmott Dixon have limited the generation of non-hazardous construction waste to 10.61 tonnes per 100m² gross internal floor area. 99.51% (tonnage) of non-demolition construction waste has been diverted from landfill.

3.7.2 Construction site environmental management

Willmott Dixon have maintained their ISO 14001 accreditation throughout the construction process, in addition to operating and implementing best practice pollution prevention policies and procedures on site in accordance with Pollution Prevention Guidelines, Working at construction and demolition sites: PPG6. All timber used during the construction process has been evidenced as being 'legally harvested and traded timber'.

Throughout construction, the principal contractor has been monitoring and will report as part of the BREEAM assessment the following:

- Energy consumption as a result of the use of construction plant, equipment (mobile and fixed) and the site accommodation (in both kWh and litres of fuel, where relevant).
- Potable water consumption (m³) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation.
- Transport movements and impacts resulting from the delivery of the majority of construction materials to site and construction waste from site (recorded in total distance travelled in km and total carbon dioxide emissions in kgCO₂eq).

4. Conclusion

This reports seeks to verify the commitments made and information provided within the Environmental Standards Statement (submitted for Planning). The Statement sought to respond to a number of policies listed within the Manchester Core Strategy relevant to energy efficiency, renewable energy environmental design, water management, weather resilience, waste management and construction management.

Following a review of As Built information and a site visit, BDP confirm that the information provided within the Environmental Standards Statement relevant to the following policies is correct for the development As Built:

- **Policy DM1** (Development Management)
- **Policy EN4** (Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development)
- **Policy EN6** (Target Framework for CO₂ Reduction from Low or Zero Carbon Energy Supplies)
- **Policy EN8** (Adaptation to Climate Change)
- **Policy EN9** (Green Infrastructure)
- **Policy EN14** (Flood Risk)
- **Policy EN17** (Water Quality)
- **Policy EN19** (Waste)

Appendix 1: BREEAM Tracker

The Manchester College - New City Campus
BREEAM New Construction (2018): Design Stage Assessment

28-Jun-22
Assessor: Mia Coleman

Evidence required
Not targeted / cannot be achieved
Compliant evidence received

BDP.

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
MANAGEMENT (1 credit = 0.52%)									
Man 01: Project brief and design									
Project Delivery Planning	Man 01-01	1	1		1	1. Prior to completion of the Concept Design, the project delivery stakeholders (see comments) meet to identify and define for each key phase of project delivery: a. Roles b. Responsibilities c. Contributions 2. Consider each one of the following items when defining roles, responsibilities and contributions for each key phase of the project: a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Occupiers budget and technical expertise in maintaining any proposed systems e. Maintainability and adaptability of the proposals f. Operational energy (see Ene 01 for further details) g. Requirements for the production of project and end user documentation h. Requirements for commissioning, training and aftercare support. 3. The project team demonstrate how the project delivery stakeholder's contributions and the consultation process outcomes influence the following: a. Initial Project Brief b. Project Execution Plan (see definition in comments) c. Communication Strategy (see definition in comments) d. Concept Design.	Pearson Fraser	2	Awarded.

Title	Credit Ref	Credits available	Route to Excellent (min. 70%) 80.19%	Potential credits 14.51%	Achieved credits 79.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Stakeholder consultation (interested parties)	Man 01-02	1	0			4. Prior to completion of the Concept Design, the independent third party consults with all interested parties (see comments) on matters that cover the minimum consultation content: 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. In the case of educational building types, minimum content also includes: 10. How the building or grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to the needs of a diverse range of pupils, students and other users, including people of all abilities. In the case of building types containing technical areas or functions, e.g. laboratories, workshops etc., minimum content also includes: 11. The end users' broad requirements for such facilities, including appropriate sizing, optimisation and integration of equipment and systems.	Pearson Fraser	2	Not targeted.
						5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.		4	
						6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties (see Definitions on page 40 of guidance manual) give and receive consultation feedback.			
						7. Education buildings - An independent party** carries out the consultation exercise. The Design Quality Indicator and the Achieving Excellence Design Evaluation Toolkit could be used as methods to assess the design quality of buildings.			
BREEAM AP (Concept Design)	Man 01 pre	-	-	-		8. The project team, including the client, formally agree strategic performance targets early in the design process with the support of the BREEAM AP where appointed).	BREEAM Assessor	2	Awarded.
	Man 01-03	1	1		1	9. Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. b. Monitor progress against the performance targets (see Definitions on page 37) agreed under criterion 8 throughout all stages after their appointment where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.			
BREEAM AP (Developed Design)	Man 01-04	1	1		1	10. Criteria 8 and 9 are achieved. 11. Involve the BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout developed design. b. Monitor progress against the performance targets agreed under criterion 8, throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.	BREEAM Assessor	4	Awarded.

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Man 02: Life Cycle Cost and Service Life Planning									
Elemental life cycle cost (LCC)	Man 02-01	2	2		2	1. A competent person carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.	Pearson Fraser	2	Awarded
						2. The elemental LCC plan: a. Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20,30,50 or 60 years); b. Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the client, in line with the design life expectancy of the building. However, where the life expectancy of the building is not yet formally agreed (due to being at very early design stages), the default design life of 60 years should be used for modelling purposes (in line with the UK default).	Pearson Fraser		
						3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Bond Bryan / BDP M&E		
Component level LCC Option Appraisal	Man 02-02	1	1		1	4. A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008. The component level LCC includes (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection The component level LCC option appraisal should review all of the above component types (where present). However, you do not need to consider every single example cited under each component; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of options are considered and help focus the analysis on components which would benefit the most from the appraisal.	Pearson Fraser	4	Awarded
						5. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Capital cost reporting	Man 02-03	1	1		1	6. Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/m2), as part of the submission to BRE. The capital cost for the building includes the expenses related to the initial construction of the building: – Construction, including preparatory works, materials, equipment and labour – Site management – Construction financing – Insurance and taxes during construction – Inspection and testing Costs related to land procurement, clearance, design, statutory approvals and post occupancy aftercare are not included.	Pearson Fraser		Awarded.
Man 03: Responsible Construction Practices									
Pre-requisite	Man 03-pre	-	-	-		1. All timber and timber based products used during the construction process of the project are 'Legally harvested and traded timber'.	Willmott Dixon		Awarded
Environmental management	Man 03-01	1	1		1	3. All parties who at any stage manage the construction site (e.g. the principal contractor, the demolition contractor) operate an EMS covering their main operations. The EMS must: a. Be third party certified, to ISO 14001:2015/EMAS or equivalent standard; or b. In compliance with BS 8555:2016 have: i. Appropriate structure ii. Reached implementation stage phase four 'implementation and operation of the environmental management system' iii. Completed defined phase audits one to four.	Willmott Dixon		Awarded
						4. All parties who at any point manage the construction site (e.g. the principal contractor, the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.			

	Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
				80.19%	14.51%	79.12%				
BREEAM AP (Site)	Man 03-02 pre	-	-	-	-		5. The client and the contractor formally agree performance targets.	Pearson Fraser		Awarded
	Man 03-02	1	1			1	6. Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in achieving and if possible going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. b. Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5. d. Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	Willmott Dixon		
Responsible Construction Management	Man 03-03	2	2			2	One credit: 7. Achieve items listed as required for one credit in table 4.1 of the guidance manual. Two credits: 8. Achieve criterion 7 9. Achieve six additional items in table 4.1 of the guidance manual.	Willmott Dixon		Awarded

	Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
				80.19%	14.51%	79.12%				
Monitoring of construction-site impacts	Man 03-04	2	2			2	10. Responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy use, water consumption and transport 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(s) must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role.	Willmott Dixon		Awarded
							First Monitoring Credit - Utility consumption Energy consumption 11. Achieve criterion 10. 12. Set targets for 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. 13. Monitor and record data for the energy consumption described in criterion 12. 14. Report the total carbon dioxide emissions (total kgCO2/project value) from the construction process via the BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking). Water consumption 15. Achieve criterion 10. 16. Set targets for the potable water consumption (m³) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation. 17. Monitor and record data for the potable water consumption described in criterion 18. Use the collated data to report the total net water consumption (m³), i.e. consumption minus any recycled water use from the construction process via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).	Willmott Dixon		
							Second Credit - Transport of construction materials and waste 19. Achieve Criterion 10. 20. Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover: 20.a. Transport of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply. Monitor as a minimum: 20.a.i. Materials used in major building elements (e.g. those defined in BREEAM issue Mat01 Environmental impacts from construction products - Building life cycle assessment (LCA). 20.a.ii. Ground works and landscaping materials. 20.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. 21. Monitor and record data for the transportation movement as described in criterion 20. 22. Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions (kgCO ₂ - eq) plus total distance travelled (km) via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).	Willmott Dixon		
	Man 03-Ex	1	1			1	23. Achieve all items in Table 4.1 of the guidance manual.	Willmott Dixon		Awarded

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Man 04: Commissioning and handover									
Commissioning and testing schedule and responsibilities	Man 04-01	1	1		1	1. Prepare a schedule of commissioning and testing. The schedule identifies a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric. 2. The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with: a. Current Building Regulations b. BSRIA guidelines c. CIBSE guidelines d. Other appropriate standards (see Methodology) Exclude from the assessment any process or manufacture-related equipment specified as part of the project. However, include such equipment in cases where they form an integral part of the building HVAC services, such as some heat recovery systems. 3. Where a building management system (BMS) is specified: a. Carry out the commissioning of air and water systems when all control devices are installed, wired and functional b. Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in Commissioning results. c. The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover d. All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover e. Fully train the occupier or facilities team in the operation of the system. 4. Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include, re-commissioning activities on behalf of the client. 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 and testing activities prior to handover,	Willmott Dixon		Awarded
Commissioning - design and preparation	Man 04-02	1	1		1	6. Achieve criteria 1-5. 7. During the design stage, the client or the principal contractor appoints an appropriate project team member provided they are not involved in the general installation works for the building services systems: with responsibility for: a. Undertaking design reviews and giving advice on suitability for ease of commissioning. b. Providing commissioning management input to construction programming and during installation stages. c. Management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager.	Willmott Dixon		Awarded
Testing and inspecting building fabric	Man 04-03	1	1		1	8. Achieve criteria 1-5. 9. Complete post-construction testing and inspection to quality-assure the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths (this is through airtightness testing and a thermographic survey). A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard. 10. Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at the design stage.	Willmott Dixon		Awarded
Handover	Man 04-04	1	1		1	11. Prior to handover, develop two building user guides for the following users: a. A non-technical user guide for distribution to the building occupiers b. A technical user guide for the premises facilities managers c. A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users. 12. Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: a. A non-technical training schedule for the building occupiers b. A technical training schedule for the premises facilities managers.	Willmott Dixon		Awarded

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Man 05: Aftercare									
Aftercare support	Man 05-01	1	1		1	1. Provide aftercare support to the building occupiers through having in place operational infrastructure and resources. This includes as a minimum: a. A meeting between the aftercare support team or individual, and the building occupier or management team (prior to initial occupation, or as soon as possible thereafter) to: i. Introduce the aftercare support available, including the content of the building user guide (where it exists) and training schedule. ii. Present key information on the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible. b. On-site facilities management training including: i. a walkabout of the building AND ii. introduction and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands. c. Provide initial aftercare support for at least the first month of building occupation, e.g. weekly attendance on-site, to support building users and management (the level of frequency will depend on the complexity of the building and building operations). d. Provide longer term aftercare support for occupiers for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users/management.	Willmott Dixon		Awarded
						2. Establish operational infrastructure and resources to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied. This facilities analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.			
Commissioning - implementation	Man 05-02	1	1		1	3. Complete the following commissioning activities over a minimum 12-month period, once the building becomes substantially occupied: a. Complex systems - Specialist Commissioning Manager will: i. Identify changes made by the owner or operator that might have caused impaired or improved performance. ii. Test all building services under full load conditions, i.e. heating equipment in mid-winter, cooling and ventilation equipment in mid-summer and under part load conditions (spring and autumn). iii. Where applicable, carry out testing during periods of extreme (high or low) occupancy. iv. Interview building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems. v. Produce monthly reports comparing sub-metered energy performance to the predicted one (see Ene01 Reduction of energy use and carbon emissions). vi. Identify inefficiencies and areas in need of improvement. vii. Re-commission systems (following any work needed to serve revised loads), and incorporate any revisions in operating procedures into the operations and maintenance (O&M) manuals. b. Simple systems (naturally ventilated) - external consultant/aftercare team/facilities manager will: i. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback. ii. Identify deficiencies and areas in need of improvement. iii. Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals.	Willmott Dixon		Awarded

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Post occupancy evaluation	Man 05-03	1	1	14.51%	1	4. The client or building occupier makes a commitment to carry out a post-occupancy evaluation (POE) exercise one year after building is substantially occupied. This gains comprehensive in-use performance feedback and identifies gaps between design intent and in-use performance. The aim is to highlight any improvements or interventions that need to be made and inform operational processes. 5. An independent party carries out the POE covering: a. A review of the design intent and construction process (review of design, procurement, construction and handover processes) b. Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering: i. Internal environmental conditions (light, noise, temperature, air quality) ii. Control, operation and maintenance iii. Facilities and amenities iv. Access and layout v. Energy and water consumption vi. Other relevant issues 6. The independent party provides a report with lessons learned to the client and building occupiers. 7. The client or building occupier commits funds to pay for the POE in advance. This requires an independent party to be appointed to carry out the POE. Evidence of the appointment of the independent party and schedule of responsibilities which fulfils the BREEAM criteria are acceptable to demonstrate compliance.	Manchester College		Awarded.
HEALTH AND WELLBEING (1 credit = 0.78%)									
Hea 01: Visual Comfort									
Control of Glare from Sunlight	Hea 01-01	1	1		1	1. Identify areas at risk of glare using a glare control assessment, The glare control assessment also justifies any areas deemed not at risk of glare. 2. A glare control strategy designs out potential glare in all relevant building areas where risk has been identified. This should be achieved through building form and layout or building design measures. 3. The glare control strategy does not increase energy and consumption used for lighting. This is achieved by: a. Maximising daylight levels in all weather, cloudy or sunny AND b. Ensuring the use or location of shading does not conflict with the operation of lighting control systems.	Bond Bryan		Awarded
Daylighting	Hea 01-02	2	0	1		4. Daylighting criteria have been met using either of the following options: a. The relevant building areas meet good practice daylight factor(s) and other criterion as outlined in Table -5.1 and Table - 5.2: 1 credit: minimum 2% daylight factor in at least 60% (m2) of relevant building areas (and either compliance with the uniformity ration requirements OR view of sky and room depth criteria in Table 5.2.) 2 credits: minimum 2% daylight factor in at least 80% (m2) of relevant building areas (and either compliance with the uniformity ration requirements OR view of sky and room depth criteria in Table 5.2.) OR b. The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table - 5.3.	BDP M&E		Not targeted
View Out	Hea 01-03	1	0			5. 95% of the floor area in 95% of relevant building areas is within 8m of an external wall. The external wall has a window or permanent opening that provides an adequate view out. 6.The window/opening must be ≥ 20% of the surrounding wall area (refer to Relevant definitions in the Additional information section). Where the room depth is greater than 8m, compliance is only possible where the percentage of window/opening is the same as, or greater than, the values in Table 1.0 of BS 8206:part 2.	Bond Bryan		Not targeted

	Title	Credit Ref	Credits available	Route to Excellent (min. 70%) 80.19%	Potential credits 14.51%	Achieved credits 79.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Internal and external lighting levels, zoning and control	Hea 01-03	1	1		1		Internal Lighting 8. Internal lighting in all relevant areas of the building is designed to provide illuminance (lux) levels and colouring rendering index in accordance with the SLL code for lighting 2012. and any other relevant industry standard. Internal lighting should be appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. 9. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 2.4, 2.13, 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. (Manufacturers' data for the luminaires should be sought to confirm this.) b. Any area where surface is used to reflect light in to a space such as uplighting, 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 wall illuminance. External Lighting 10. All external lighting located within the construction zone is specified in accordance with BS5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting - lighting of work places - Part 2: Outdoor workplaces. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. 11. Where no external light fittings are specified (either separate from or mounted on the external building façade of roof), the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with criteria 8-9. Zoning and occupant control 12. Internal lighting is zoned to allow for occupant control. Zoning is in accordance with the criteria below for relevant areas present within the building: a. In office areas, zones of no more than four workplaces b. Workstations adjacent to windows/atria and other building areas separately zoned and controlled c. Seminar and lecture rooms: zoned for presentation and audience areas d. Library spaces: separate zoning of stacks, reading and counter areas e. Teaching space or demonstration area f. Whiteboard or display screen g. Auditoria: zoning of seating areas, circulation space and lectern area h. Dining, restaurant, café areas: separate zoning of servery and seating/dining areas i. Retail: separate zoning of display and counter areas j. Bar areas: separate zoning of bar and seating areas k. Wards or bedded areas: zoned lighting control for individual bed spaces and control for staff over groups of bed spaces l. Treatment areas, dayrooms, waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff. 13. Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5. 14. In addition, for education buildings: Manual lighting controls are easily accessible for the teacher while teaching and on entering or leaving the teaching space. Manual lighting controls need only be provided for staff, not the children. Lighting zoning and control - auditoria spaces: The controls specified will depend on the size and use of the space but a typical auditorium or lecture theatre with stepped seating and a formal lectern, demonstration or performance area would typically be expected to have lighting controls as follows: 1. Full normal lighting (to allow for entry, exit, cleaning etc.) 2. Demonstration area lighting off and audience area lighting reduced to a low level (for the purpose of line slide projection, but allowing enough light for the audience to take notes) 3. All lighting off (for the projection of tone slides, colour slides, and for the purposes of visual demonstrations or performances) 4. Separate localised lectern lighting.	BDP M&E		Awarded.
Exemplary level criteria	Hea 01-03 EX	1	0	1			15. To achieve an exemplary performance credit for daylighting: Daylighting criteria have been met using either of the following options: a. Relevant building areas meet exemplary daylight factors and the relevant criteria in Table 5.8 of the guidance manual. b. Relevant building areas meet exemplary average and minimum point daylight illuminance criteria in Table 5.9 of the guidance manual.	BDP M&E		Not targeted
	Hea 01-03 EX	1	0	1			16. To achieve an exemplary performance credit for Internal and external lighting levels, zoning and control: Lighting in each zone can be manually dimmed by occupants down to 20% of the maximum light output using dimmer switches positioned in accessible locations. Dimming and control gear should avoid flicker and noise.	BDP M&E		Not targeted

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Hea 02: Indoor Air Quality									
Pre-Requirement	Hea 02-Pre	-	-	-		Indoor air quality (IAQ) plan: 1. A site-specific indoor air quality plan has been produced and implemented in accordance with the guidance in Guidance Note GN06. The plan must be produced no later than the end of Concept Design. 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 (where present, consideration is given to the air quality requirements of specialist areas such as laboratories) c. Procedures for pre-occupancy flush out. d. Third party testing and analysis. e. Maintaining good indoor air quality in-use.	Bond Bryan / BDP M&E	2	Awarded
Ventilation	Hea 02-01	1	0			2. 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 c. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3. The specified filters should achieve a minimum Indoor Air Quality of IDA2. 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 ability to alert the building owner or manager when CO ₂ 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. e. For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates in accordance with CIBSE AM10.	BDP M&E		Not targeted
Emissions from construction products	Hea 02-02	2	2		2	One credit: 3. Three out of the five product types meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 of the guidance manual. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures fittings must be tested and classified as formaldehyde E1 class as a minimum. Two credits: 4. All of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 of the guidance manual.	Bond Bryan		Awarded.
Post construction indoor air quality measurement	Hea 02-03	1	1		1	5. The formaldehyde concentration indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/ m ³ averaged over 30 minutes. (World Health Organisation guidelines for indoor air quality: Selected pollutants, 2010). 6. The formaldehyde sampling and analysis is performed in accordance with ISO 16000-2 and ISO 16000-3. 7. The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 500µg/ m ³ over 8 hours. 8. The TVOC sampling and analysis is performed in accordance with ISO 16000-5 and ISO 16000-6 or ISO 16017-1. 9. 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 TVOC and formaldehyde levels to within the above limits. 10. The measured concentration levels of formaldehyde (µg/ m ³) are reported via the BREEAM Scoring and Reporting Tool.	Willmott Dixon		Awarded.
Exemplary level criteria	Hea 02-Ex	1	0	1		11. Three of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.12 of the guidance manual. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures and fittings must be tested and classified as formaldehyde E1 class as a minimum,	Bond Bryan		Not targeted

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Hea 04: Thermal Comfort									
Thermal Modelling	Hea 04-01	1	1		1	1. Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling. 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 design, 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 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 or CIBSE TM59: Design methodology for the assessment of overheating risk in homes. Alternatively, for Education buildings design teams can refer to Building Bulletin 101, Ventilation of school buildings. For schools with a straightforward servicing strategy, ClassCool is considered a suitable alternative to AM11 full dynamic model. 4. 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.	BDP M&E		Awarded.
Design for Future Thermal Comfort	Hea 04-02	1	1		1	5. Criteria 1 to 4 are achieved. 6. The thermal modelling demonstrates that the relevant requirements set out in criteria 3 are achieved for a projected climate change environment. 7. Where criterion 6 is not met, the project team demonstrated how the building has been adapted or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under criterion 6. 8. For air conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	BDP M&E		Awarded
Thermal zoning and controls	Hea 04-03	1	1		1	9. Criteria 1 to 4 are achieved 10. The thermal modelling analysis (criteria 1 to 4) has informed the temperature control strategy for the building and its users. 11. The strategy for proposed heating/cooling system(s) 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. The degree of occupant control required for these zones, based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) considers: b.i. User knowledge of building services b.ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required) b.iii. How the user is likely to operate or interact with the system(s), e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc. b.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). c. 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. d. The need or otherwise for an accessible building user actuated manual override for any automatic systems. <td>BDP M&E</td> <td></td> <td>Awarded.</td>	BDP M&E		Awarded.

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Hea 05: Acoustic Performance									
Acoustic Performance	Hea 05-01	3	3		3	1. The building meets the appropriate acoustic performance standards and testing requirements defined in Table 5.14 of the guidance manual which defines criteria for the acoustic principles of: a. Sound insulation b. Indoor ambient noise level c. Room acoustics. OR 2. A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion Hea05 Acoustic Performance - Criterion 1, setting out the performance requirements for each and the testing regime required.	Hoare Lea / Willmott Dixon		Awarded
Hea 06: Security									
Security of Site and Building	Hea 06-01	1	1		1	1. A suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The 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.	Simpson Haugh	2	Awarded,
						2. The SQSS develops a set of security controls and recommendations for incorporation into the proposals. These 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.	Bond Bryan / Simpson Haugh / BDP M&E		
Exemplary Level Criteria	Hea 06-Ex	1	0			4. To achieve an exemplary level performance credit: A compliant risk based security rating scheme has been used. The performance against the scheme has been confirmed by independent assessment and verification.	Bond Bryan / Simpson Haugh		Not targeted
Hea 07: Safe and Healthy Surroundings									
Safe Access	Hea 07-01	1	1		1	1. Where external site areas form part of the assessed development the following apply: Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. 2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space d. Connecting to off-site paths where applicable. 3. Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths. 4. Where vehicle delivery access to drop-off areas form part of the assessed development, the following apply: a. pedestrian and cyclist paths b. outside amenity areas accessible to building users and general public 5. There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. 6. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.	Bond Bryan / Simpson Haugh		Awarded
Outside Space	Hea 07-02	1	1		1	7. There is an outside space providing building users with an external amenity area.	Bond Bryan / Simpson Haugh		Awarded

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
ENERGY (1 credit = 0.64%)									
Ene 01: Reduction of energy use and carbon emissions									
Energy Performance	Ene 01-01	9	5		5	1. Calculate an Energy Performance Ratio for New Constructions (EPRNC). Compare the EPRNC achieved with the benchmarks in Table 6.1 in the guidance manual and award the corresponding number of BREEAM credits.	BDP M&E / Briggs & Forrester		Awarded.
Prediction of Operational Energy Consumption	Ene 01-02	4	0	4		2. Involve relevant members of the design team in an energy design workshop, focusing on operational energy performance. 3. Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures. (see Prediction of operational energy consumption on page 125 of the guidance manual - assessor to provide.) 4. Report predicted energy consumption targets by end use, design assumptions and input data (with justifications). 5. Carry out a risk assessment to highlight any significant design, technical and process risks that should be monitored and managed throughout the construction and commissioning process.	BDP M&E		Not targeted
Exemplary level criteria	Ene 01-Ex	2	0	2		10. Achieve maximum available credits in Ene 02 Energy monitoring. 11. The client or building occupier commits funds to pay for the post occupancy stage. This requires an assessor to be appointed and to report on the actual energy consumption compared with the targets set in criterion 4. 12. The energy model (criterion 3) is: a. Submitted to BRE and b. Retained by the building owner.	BDP M&E		Not targeted
Ene 02: Energy Monitoring									
Sub-metering of end-use categories	Ene 02-01	1	1		1	1. Install energy metering systems so 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: a. If the area is greater than 1,000m², by end-use category with an appropriate energy monitoring and management system. b. If the area is less than 1,000m², use either: i. an energy monitoring and management system or ii. 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 users, for example through labelling or data outputs.	BDP M&E		Awarded.

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Sub-metering of high energy load and tenancy areas	Ene 02-02	1	0	1		4. 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 OR b. Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management system for: i. tenanted areas ii. relevant function areas or departments in single occupancy buildings. 5. Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogenous function, for example hotel bedrooms, offices.	BDP M&E / Briggs & Forrester		Not targeted
Ene 03: External Lighting									
	Ene 03-01	1	1		1	1. No external lighting (which includes lighting on the building, at entrances and signs). OR 2. External light fittings within the construction zone with: a. Average initial efficacy of not less than 70 luminaire lumens per circuit Watt. b. Automatic control to prevent operation during daylight hours. c. Presence detection in areas of intermittent pedestrian traffic.	BDP M&E		Awarded.
Ene 04: Low carbon design									
Passive design analysis	Ene 04-01	1	1		1	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 design team analyses the proposed building design and development during concept design to identify opportunities for the implementation of passive design measures. 3. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings. 4. Quantify the reduced total energy demand and carbon dioxide (CO ₂) emissions resulting from the passive design measures.	BDP M&E	2	Awarded
Free Cooling	Ene 04-02	1	0			5. Achieve the passive design analysis credit. 6. Include free cooling analysis in the passive design analysis carried out under criterion 2. 7. Identify opportunities for the implementation of free cooling solutions. 8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in free cooling analysis.	BDP M&E		Not targeted
Low and zero carbon feasibility study	Ene 04-03	1	1		1	9. An energy specialist completes a feasibility study by the end of the concept design. 10. Establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy sources for the building or development based on the feasibility study. 11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. 12. Quantify the reduced regulated carbon dioxide (CO ₂) emissions resulting from the feasibility study.	BDP M&E	2	Awarded.
Ene 05: Energy Efficient Cold Storage									
Refrigeration Energy Consumption	Ene 05-01	1	1		1	1. Design, install and commission the refrigeration system: a. In accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector and BS EN 378-2:2016. b. Using robust and tested refrigeration systems or components included on the Enhanced Capital Allowance Energy Technology Product List or and equivalent list. 2. Commission the refrigeration plant in compliance with the commissioning criteria in BREEAM issue Man 04 Commissioning and handover.	BDP M&E / Willmott Dixon / HK Projects		Awarded
Indirect Greenhouse Gas Emissions	Ene 05-02	1	1		1	3. Achieve criteria 1 and 2. 4. Demonstrate a saving in indirect greenhouse gas emissions (CO ₂ -eq) from the installed refrigeration system over the course of its operational life.	HK Projects		Awarded

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Ene 06: Energy Efficient Transportation Systems									
Energy Consumption	Ene 06-01	1	1		1	1. For specified lifts, escalators and moving walks (transportation types) : a. Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators and/or moving walks. b. Calculate the energy consumption in accordance with BS EN ISO 25745 Energy performance of lifts, escalators and moving walks, Part 2 : Energy calculation and classification for lifts (elevators) and/or Part 3 - Energy calculation and classification for escalators and moving walks, for one of the following: i. At least two types of system (for each transportation type required); OR ii. An arrangement of systems (e.g. for lifts, hydraulic, traction, machine room-less lift (MRL)); OR iii. A system strategy which is 'fit for purpose'. c. Consider the use of regenerative drives, subject to the requirements in the guidance manual. d. Specify the transportation system with the lowest energy consumption.	Lift Consultant / Willmott Dixon		Awarded.
Energy efficient features	Ene 06-02	1	1		1	2. Criterion 1 is achieved. 3. Specify the following three energy efficient features for each lift: a. A standby condition for off-peak periods. b. The lift car lighting and display lighting provides an average luminous efficacy, (across all fittings in the car) of > 70 luminaire lumens/circuit Watt. c. The lift uses a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. 4. Specify regenerative drives where their use is demonstrated to save energy.	Lift Consultant / Willmott Dixon		Awarded.
			0			5. Specify at least one of the following for each escalator or moving walk: a. A load-sensing device that synchronises motor output to passenger demand through a variable speed drive OR b. A passenger-sensing device for automated operation (auto walk), so the escalator operates in auto start mode when there is no passenger demand.			Awarded.
Ene 08: Energy Efficient Equipment									
	Ene 08-01	2	0			1. Identify the building's unregulated energy consuming loads and estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical/standard specification. 2. Identify the systems and/or processes that use a significant proportion of the total annual unregulated energy consumption of the building. 3. Demonstrate a meaningful reduction in the total annual unregulated energy demand of the building. Table 6.5 in the guidance manual lists examples of significant contributors to unregulated energy consumption and the associated criteria. If additional significant contributors, not listed in the table, will be specified, the design team should justify how a meaningful reduction will be achieved for these contributors.	BDP M&E		Not targeted

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
TRANSPORT (1 credit = 0.83%)									
Tra 01: Transport Assessment and Travel Plan									
Travel Plan	Tra 01-01	2	2		2	1. During the feasibility and design stages, develop a travel plan based on a site-specific travel assessment or statement. 2. The site-specific travel assessment or statement covers as a minimum: a. Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities if relevant. b Travel patterns and transport impacts of future building users c. Current local environments for walkers and cyclists (accounting for visitors who may be accompanied by young children.) d. Reporting the number and type of existing accessible amenities, see table 7.1 in the guidance manual, within 500m of the site. e. Disabled access (accounting for varying levels of disability and visual impairment). f. Calculation of the existing public transport Accessibility Index. g. Current facilities for cyclists. 3. Following a transport assessment (in accordance with the requirements set out in criteria 2), develop a site-specific travel plan that provides a long term management strategy which encourages more sustainable travel. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation. 4. If the occupier is known, involve them in the development of the travel plan. 5 Demonstrate that the travel plan will be implemented and supported by the building's management in operation.	SK Transport		Awarded.
Tra 02: Sustainable Transport Measures									
Sustainable Transport Measures	Tra 02-Pre	-	-	-	-	1. Achieve the Tra 01 Transport assessment and travel plan credits.	Bond Bryan / BDP M&E / Pearson Fraser		Awarded
	Tra 02-01	10	10		10	2. Identify the sustainable transport measures in table 7.4 of the guidance manual 3. Award credits according to the Accessible Index of the project and the total number of points achieved for the options implemented. (See table 7.3 of the guidance manual.)* * Current targeted points include: - Achieving an AI of 8 or more. (1 point) - Provide electric recharging stations of a minimum of 3kW for at least 10% of the total car parking capacity for the development. (1 point) - Provide a real time public transport information system in a publically accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure. This may include signposting to public transport, cycling, walking infrastructure or local amenities. (1 point) - Design team consults with the local authority on the state of the local cycling network and access to public accessible pedestrian routes, focus on what the LA deems most relevant to the project and how to improve it. One proposition is agreed and implemented and is additional to existing local plans and has significant impact on local cycling network or pedestrian routes open to the public (2 points) - At least three existing accessible amenities are present (table 7.6). (1 point) - A minimum of 1 new accessible amenity (found in table 7.6) is provided (2 points). - Installed compliant cycle storage spaces to meet the following minimum levels. (1 point) 1 space per 10 staff/pupils/students in total. Use sliding scale of compliance if more than 200 building users. - Option 7 has been achieved. Provide at least two compliant cyclists' facilities for the building users (including pupils where appropriate to the building type). Facilities include showers, changing facilities, lockers and drying spaces. (1 point)			

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
WATER (1 credit = 0.78%)									
Wat 01: Water Consumption									
Water Consumption	Wat 01-01	5	3		3	1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components. 2. Use the standard Wat01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Award BREEAM credits based upon the following: 1 credit: 12.5% 2 credits: 25% 3 credits: 40% 4 credits: 50% 5 credits: 55% Where it is not possible to use the standard method, and for some building types, complete the assessment using the alternative Wat 01 method.	Bond Bryan / HK Projects		Awarded.
						3. If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components.			
						4. If a greywater or rainwater system is specified and installed: a. Greywater systems in compliance with BS 8525-1:2010 Greywater systems - Part 1 Code of Practice. b. Rainwater systems in compliance with BS 8515:2009+A1:2013 Rainwater harvesting systems - Code of practice Achieve Assessment scope - Criterion 6 on page 201, if you intend to pursue a post occupancy stage certification.			
Wat 02: Water Monitoring									
Water Monitoring	Wat 02-01	1	1		1	1. The specification of 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.	BDP M&E		Awarded.
						2. 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 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. In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels.			
						5. In buildings containing laboratories, fit a separate water meter on the water supply to any process cooling loop for 'plumbed in' laboratory process equipment, irrespective of their water consumption levels.			
						6. <i>Additionally for those pursuing a post occupancy stage certification:</i> The water monitoring strategy used enables the identification of all water consumption for sanitary uses as assessed under Wat 01 (litres/person/day) if a post occupancy stage certification is sought.			

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Wat 03: Water Leak Detection and Prevention									
Leak detection system	Wat 03-01	1	1		1	1. Install a leak detection system capable of detecting a major water leak: a. On the utilities water supply within the buildings, to detect any major leaks within the buildings AND b. Between the buildings and the utilities water supply, to detect any major leak between the utilities supply and the buildings under assessment. 2. The leak detection system is: 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. b. Activated when the flow of water passing through the water meter or data logger is at a flow rate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flow rates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system. c. Able to identify different flow and therefore leakage rates e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit the building type and owners or occupiers usage patterns. d. Programmable to suit the owner's or occupiers water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers. Where there is physically no space for a leak detection system between the utilities water meter and the building, alternative solutions can be used, provided that a major leak can still be detected.	BDP M&E		Awarded.
Flow control devices	Wat 03-02	1	1		1	2. Install flow control devices that regulate the supply of water to each WC area/sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework.	BDP M&E		Awarded.
Wat 04: Water Efficient Equipment									
Water efficient equipment	Wat 04-01	1	1		1	1. Identify all water demands from users other than those considered under Wat 01 that could be realistically mitigated or reduced. Where there is no water demand from uses other than domestic -style, sanitary use components in the building, this issue is not applicable. 2. Identify systems or processes to reduce the relevant water demand (criterion 1) and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.	Briggs & Forrester		Awarded

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
MATERIALS (1 credit = 1.07%)									
Mat 01: Life Cycle Impacts									
Superstructure	Mat 01-01	6	6		6	Option appraisal during Concept Design (all building types). 4. During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (applicable to the Concept Design stage) b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology. c. For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency). d. Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document. e. Record the following in the Mat 01/02 Results Submission Tool: The differences between the design options; the design option selected by the client to be progressed beyond Concept Design; the reasons for selecting it and the reasons for not selecting the other design options. f. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). If the building LCA tool recognised by BREEAM and used for criteria 3 to 5 (and 6 to 9, if pursued) is not an IMPACT Compliant LCA tool and criteria 1 to 2 are applicable, then BREEAM Simplified Building LCA tool (or an IMPACT Compliant LCA tool) shall be used for criteria 1 to 2.	Bond Bryan	2	Awarded
						Options appraisal during Technical Design (all building types) 5. During Technical Design identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage). b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology. c. As criteria 4.c. to 4.e. above. Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options. d. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design. Where a project has not achieved criteria 3 and 4, criterion 5 may still be achieved.	Bond Bryan	4	Awarded
Substructure and Hard Landscaping options appraisal During	Mat 01-02	1	1		1	6. Criteria 3 and 4 are achieved. 7. During Concept Design identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping). b. Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology. c. As criteria 4.c. to 4.f.	Bond Bryan	2	Awarded
Exemplary Performance Criteria	Mat 01-Ex1	1	1		1	8. Criteria 3-4 are achieved. 9. During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of at least 3 significantly different core building services design options. b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing core building services during Concept Design) according to the methodology. c. As criteria 4.c. to 4.f.	BDP M&E	2	Awarded
Mat 02: Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)									
Specification of products with a recognised EPD	Mat 02-01	1	1		1	1. Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the BREEAM methodology (to be supplied by the assessor).	Bond Bryan / Willmott Dixon		Awarded
						2. Enter the details of each EPD into the Mat 01/02 Results Submission Tool, including the material category classification. The mat 01/02 results submission tool will verify the EPD points score and credit award.	BREEAM assessor		

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Mat 03: Responsible Sourcing of Construction Products									
Ensuring Sustainable Procurement	Mat 03-Pre	-	-	-	-	1. All timber and timber based products used on the project is ' Legally harvested and traded timber' as per the UK government's Timber Procurement Policy (TPP)	Willmott Dixon		Awarded
	Mat 03-01	1	1			2. A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must: a. Be in place before Concept Design b. Include sustainability aims, objectives and strategic targets to guide procurement activities. Note: targets do not need to be achieved for the credit to be awarded but justification must be provided for targets that are not achieved. c. Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible. d. Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan. In addition if the plan is applied to several sites or adopted at an organisational level it must: e. Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO 20400:2017.	BREEAM Assessor / Bond Bryan / Pearson Fraser	1	
Measuring responsible sourcing	Mat 03-02	3	1		1	3. Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved. (Use table 9.10 in the guidance manual).	Willmott Dixon / Briggs & Forrester		
Mat 05: Designing for durability and resilience									
Designing for durability and resilience	Mat 05-01	1	1		1	Protecting vulnerable parts of the building from damage 1. Protection measures are incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against: a. Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.) b. Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c. External building fabric damage by vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building facade and where delivery areas or routes are within 2 metres of the facade i.e. specifying bollards or protection rails. d. Potential malicious damage to building materials and finishes in public and common areas where appropriate.	Bond Bryan / Simpson Haugh		Awarded.
						Protecting exposed parts of the building from material degradation 2. Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: a. The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14 of the guidance manual. If none are available use BS 7543:2015 as the default appropriate standard. OR b. A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors.			
						3. Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design.			
						4. Design the roof and façade to prevent water damage, ingress and detrimental ponding. See Table 9.14 in the guidance manual for an example list of relevant industry durability and quality standards.			

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Mat 06: Material efficiency									
Material efficiencies	Mat 06-01	1	1		1	1. At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages: a. Preparation and Brief b Concept Design c. Developed Design d Technical design e. Construction	Bond Bryan	1 to 5	Awarded
						2. Develop and record the implementation of material efficiency during: a. Developed Design b. Technical Design c. Construction			
						3. Report the targets and actual material efficiencies achieved.			
WASTE (1 credit = 0.60%)									
Wst 01: Construction Waste Management									
Pre-Demolition Audit	Wst 01-01	1	1		1	1. Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of pre-demolition audit scope and: a. Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works. b. Guide the design, consider materials for reuse and set targets for waste management. c. Engage all contractors in the process of maximising high grade reuse and recycling opportunities. d. Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets.	Willmott Dixon	2	Awarded
						2. Make reference to the audit in the resource management plan (RMP).	Willmott Dixon		
Construction resource efficiency	Wst 01-02	3	1		1	3. Prepare a compliant Resource Management Plan (RMP) covering: a. Non-hazardous waste materials (from on-site construction and dedicated off-site manufacturer or fabrication) including demolition and excavation waste. b. Accurate data records on waste arising's and waste management routes. 4. Meet or improve upon the benchmarks below for non-hazardous construction waste, excluding demolition and excavation waste: Amount of waste generated per 100m2 GIFA: 1 credit: ≤ 13.3m2 actual volume (not bulk) / ≤ 11.1 tonnes 2 credits: ≤ 7.5m2 actual volume (not bulk) / ≤ 6.5 tonnes 3 credits: ≤ 3.4m2 actual volume (not bulk) / ≤ 3.2 tonnes Exemplary level: ≤ 1.6m2 actual volume (not bulk) / ≤ 1.9 tonnes	Willmott Dixon		Awarded
Diversion of resources from landfill	Wst 01-03	1	1		1	5. Meet, where applicable, the diversion from landfill benchmarks below for non-hazardous construction waste and demolition and excavation waste generated: Non-demolition: 70% volume / 80% tonnage Demolition: 80% volume / 90% tonnage Excavation: n/a	Willmott Dixon		Awarded
						6. Sort waste materials into separate key waste groups as per Table 10.3 of the guidance manual, either on-site or through a licensed contractor for recovery.			

Title	Credit Ref	Credits available	Route to Excellent (min. 70%) 80.19%	Potential credits 14.51%	Achieved credits 79.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Wst 02: Recycled Aggregates									
Pre- Requisite	Wst 02-Pre	-	-	-	-	1. If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Assessment scope- Criterion 1 and Assessment Scope - Criterion 2	AECOM / Willmott Dixon		Not targeted
Sustainable Aggregate Points	Wst 02-01	1	0	1		2. Identify all aggregate uses and types on the project Table 10.5, and Table 10.6 in the guidance manual.	AECOM / Willmott Dixon		
						3. Determine the quantity in tonnes for each identified use and aggregate type.			
						4. Identify the region in which the aggregate source is located.			
						5. Calculate the distance in kilometres travelled by all aggregates by transport type.			
						6. Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points. The corresponding number of BREEAM credits will be awarded (refer to Table 10.4 in the guidance manual).			
Exemplary Performance Criteria	Wst 02-Ex	1	0	1		To achieve an exemplary performance credit: 7. The Project Sustainable Aggregate Points score meets or exceeds the exemplary level performance benchmark in Table 10.4 of the guidance manual.	AECOM / Willmott Dixon		
Wst 03: Operational Waste									
Operational Waste	Wst 03-01	1	1		1	1. Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily / weekly operational activities and occupancy rates.	BDP M&E		Awarded
						2. 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 or composted on site.			
Wst 05: Adaptation to climate change									
Resilience of structure, fabric, building services and renewables installation	Wst 05-01	1	1		1	1. Conduct a climate change adaptation strategy appraisal using: a. A systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes: i. Hazard identification ii. Hazard assessment iii. Risk estimation iv. Risk evaluation v. Risk management.	Bond Bryan / AECOM / BDP M&E	2	Awarded.
						2. Develop recommendations or solutions based on the climate change adaptation strategy appraisal, before or during concept design, that aim to mitigate the identified impact.			
						3. Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor.	Bond Bryan / AECOM / BDP M&E	4	

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Exemplary Criteria	Wst 05-Ex	1	0	1		Achievement of the following criteria demonstrates a holistic approach to the design and construction of the building's life cycle to mitigate against the impacts of climate change. To achieve an exemplary level performance credit: 4. Meet criteria 1-3.	BREEAM assessor		Not targeted
						5. Meet the criteria or achieve credits of the assessment issues given below: - Hea 04: Criterion 6 - Ene 01: Minimum 6 credits - Ene 04: Passive design credit - Wat 01: Minimum 3 credits - Mat 05: Criteria 2 - 4 - Pol 03: Minimum 1 credit for flood resilience and 2 credits under Surface Water Runoff			
Wst 06: Design for Disassembly and Adaptability									
Recommendations	Wst 06-01	1	1		1	1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design.	Bond Bryan	2	Awarded
						2. Develop recommendations or solutions based on the study during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.			
Implementation	Wst 06-02	1	1		1	3. Achieve criteria 1 and 2. 4. Provide an update, during Technical Design, on: a. How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. b. Changes to the recommendations and solutions during the development of the Technical Design.	Bond Bryan	4	
						5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.			
LAND USE AND ECOLOGY (1 credit = 1.00%)									
LE 01: Site Selection									
Previously Occupied Land	LE 01-01	1	1		1	1. At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.	Bond Bryan		Awarded
Contaminated Land	LE 01-02	1	0			2. A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified: a. The degree of contamination b. The contaminant sources/types c. The options for remediating sources of contamination which present an unacceptable risk.	AECOM		Not targeted
						3. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional.			

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
LE 02: Identifying and understanding the risks and opportunities for the project									
Pre-Requirement	LE 02-Pre	-	-	-	-	Assessment route selection 1. An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist.	Ascerta / Manchester College / Willmott Dixon	2	Awarded
						2. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	Willmott Dixon		
Survey and Evaluation and Determining Ecological Outcomes	LE 02-01	2	2	2	Route 1 3. Completion of the BREEAM Ecological Risk Evaluation Checklist indicates Assessment route 1 can be used as the assessment.	Design Team			
					Route 2 4. An appropriate individual is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions.	Pearson Fraser / Bond Bryan			
					5. Prior to the completion of the preparation and brief, an appropriate level of survey and evaluation (see assessment route 2, for sites where complex ecological systems are likely to be present) has been carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish a. Current and potential ecological value and condition of the site, and related areas within the zone of influence. b. Direct and indirect risks to current ecological value. c. Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence.	Ascerta / Pearson Fraser			
					6. Data is collected and shared with project team to inform the site preparation, design or construction works.				
					7. Survey evaluation criteria (criteria 3-6) relevant to the chosen route have been achieved.				
					8. During Concept Design, the project team liaise and collaborate with representative stakeholders to identify and consider ecological outcomes for the sites (appropriate to the scale and type of development) for the project. 9. When determining the ecological outcome for the site, this must involve the identification, appraisal and selection of specific solutions and measures sufficiently early to influence key project planning decisions. This must be done in accordance with the following hierarchy of action: a. Avoidance b. Protection c. Reduction or limitation of negative impacts d. Onsite compensation and, e. Enhancement, considering the capacity and feasibility within the site, or where viable, off-site.	Ascerta / Bond Bryan / Manchester College			
					10. Following this, the optimal ecological outcome for the site is selected after liaising with the representative stakeholders and the project team.				
LE 03: Managing Negative Impacts on Ecology									
Pre-Requirement	LE 03-Pre	-	-	-	-	1. LE02 has been achieved. 2. The client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site.	Willmott Dixon		Awarded
Planning, Liaison, Implementation and Data	LE 03-01	1	1	1	3. Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief.	Design Team			
					4. Site preparation and construction works have been planned for and are implemented at an early project stage to optimise benefits and outputs.	Willmott Dixon			
					5. The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions, and measures have been selected during site preparation and construction works.	Design Team			

Title	Credit Ref	Credits available	Route to Excellent (min. 70%) 80.19%	Potential credits 14.51%	Achieved credits 79.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Managing Negative Impacts of the Project	LE 03-02	2	1	1	1	Route 1 (one credit) 6. Negative impacts from site preparation and construction works have been managed according to the hierarchy and no net impact has resulted. Route 2 (up to two credits) 7. Negative impacts from site preparation and construction works have been managed according to the hierarchy (see Assessment route 2: For sites where complex ecological systems are likely to be present) and either: a. No overall loss of ecological value has occurred (2 credits) b. The loss of ecological value has been limited as far as possible (1 credit)	Willmott Dixon / Ascerta		Awarded
LE 04: Change and Enhancement of Site Ecology									
Pre-Requisite	LE 04-Pre	-	-	-	-	1. Criteria 2-3 in LE 03 have been achieved. 2. The client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site.	Design Team Willmott Dixon		Awarded.
Liaison, Implementation and Data Collection	LE 04-02	1	1		1	Route 2 5. The project team liaising and collaborating with representative stakeholder, taking into consideration data collated and shared, have implemented the solutions and measures selected in a way that enhances ecological value in the following order: a. On site, and where this is not feasible b. Off site within the zone of influence	Ascerta / Simpson Haugh / Willmott Dixon		
Enhancement of Ecology	LE 04-03	3	3		3	Route 2 b. Up to three credits are awarded based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. Credits are awarded as follows: a. Minimising loss of ecological value (one credit - percentage score of 75-94) b. No net loss of ecological value (two credits - percentage score of 95-104) c. Net gain of ecological value (three credits - percentage score of 105-109)	Ascerta / Simpson Haugh		
Exemplary level criteria	LE 04-EX	1	1		1	7 The change in ecological value occurring is calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. The credit is awarded as follows: a. Significant net gain of ecological value (percentage score of 110 or above)	Ascerta / Simpson Haugh		Awarded.
LE 05: Long Term Ecology Management and Maintenance									
Pre-Requisite	LE 05-Pre	-	-	-		1 The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site. 2 The following must be achieved, according to the route being assessed: a Route 1 - Criteria 2-3 in LE 03 have been achieved. b Route 2 - Criteria 2-3 in LE 03 have been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.	Willmott Dixon		Awarded
Planning, liaison, data, monitoring and review management and maintenance	LE 05-01	1	1		1	3. The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to: a Monitor and review the effectiveness with which the plans for LE 03 & LE 04 are implemented b. Develop and review management and maintenance solutions, actions or measures.	Simpson Haugh / Manchester College		
						4. In support of the above and to help ensure their continued relevance over the period of the project the following should be considered: a. Monitoring and reporting of the ecological outcomes for site implemented at the design and construction stage b. Monitoring and reporting of outcomes and successes from the project c. Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site) d. Maintaining the ecological value of the site and its relationship or connection to its zone of influence e. Maintaining the site in line with any sustainability linked activities, e.g. ecosystems benefits (LE 02). f. Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04.	Willmott Dixon		
						5. As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value and biodiversity on or near the site.	Willmott Dixon		
						6. The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site.	Simpson Haugh		

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Landscape and Ecology Management Plan (or similar) development	LE 05-02	1	1	14.51%	19.12%	7. Landscape and ecology management plan, or equivalent, is developed in accordance with BS 42020:2013 Section 11.1(210) covering as a minimum the first five years after project completion and includes: a. Actions and responsibilities, prior to handover, to give to relevant individuals b. The ecological value and condition of the site over the development life. c. Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework d. Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts e. Clearly defined and allocated roles and responsibilities.	Bond Bryan / Simpson Haugh		Awarded
POLLUTION (1 credit = 0.66%)									
Pol 01: Impact of Refrigerants									
Impact of refrigerant	Pol 01-01	2	0	2		Three credits - No refrigerant use 1. Where the building does not require the use of refrigerants within its installed plant/systems. OR alternatively, where the building does require the use of refrigerants, the three credits can be awarded as follows: Pre-requisite 2. All systems (with electric compressors) must comply with the requirements of BS EN 378:2016 (parts 2 and 3) and where refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice Two credits - Impact of refrigerant 3. Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) of ≤ 100 kgCO2e/kW cooling/heating capacity. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation. To calculate the DELCO2e please refer to the Relevant definitions in the Additional information section and the Methodology section. OR 4. Where air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) ≤10. OR One credit - Impact of refrigerant 5. Where the systems using refrigerants have Direct Effect Life Cycle CO2equivalent emissions (DELCO2e) of ≤ 1000 kgCO2e/kW cooling/heating capacity.	BDP M&E		Not targeted
Leak detection	Pol 01-02	1	1		1	6. All systems are hermetically sealed or only use environmentally benign refrigerants. OR 7. Where the systems are not hermetically sealed: a. Systems have: i. A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. OR ii. An inbuilt automated diagnostic procedure for detecting leakage is enabled. b. In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant (see automatic isolation and containment of refrigerant).	BDP M&E		Awarded.
Pol 02: Local Air Quality									
Local Air Quality	Pol 02-01	2	0			1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively; 2. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in Table 12.4 and Table 12.5 in the guidance manual (assessor to provide). The measurements must be provided by manufacturers, following the labelling requirements of the European Directive 2009/125/EC. No credits can be awarded for Pol02 if any of the combustion appliances are not covered in Table 12.4 and Table 12.5 in the guidance manual. 3. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in table 12.4 and 12.15 of the guidance manual.	BDP M&E		Not targeted

Title	Credit Ref	Credits available	Route to Excellent (min. 70%) 80.19%	Potential credits 14.51%	Achieved credits 79.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Pol 03: Flood and Surface Water Management									
Flood resilience	Pol 03-01	2	1		1	1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Two credits - Low flood risk 2. A site-specific flood risk assessment (FRA) confirms that the development is in a flood zone that is defined as having low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration. One credit - Medium/high flood risk 3. A site-specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. The FRA must take all current and future sources of flooding into consideration. For smaller sites, refer to Level of detail required in the FRA for smaller sites which overrides criterion 2. 4. To increase the resilience of the development to flooding, one of the following must be achieved: a. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the site's flood zone. b. The final design of the building and wider site reflects the recommendations made by an appropriate consultant with the hierarchy approach outlined in section 5 of BS 8533:2017.	AECOM		Awarded
Surface Water Run-off	Pol 03-Pre	-	-	-	-	5. Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and the surrounding site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site.	AECOM		Awarded
	Pol 03-02	1	1		1	One credit - Surface water run-off - Rate 6. Drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events. 7. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDs) are in place. 8. Calculations include an allowance for climate change. This should be made in accordance with the current best practice planning guidance.	AECOM / Willmott Dixon		
	Pol 03-03	1	1		1	One credit - Surface Run-off - Volume 9. Flooding of property will not occur and in the event of local drainage system failure (caused by either extreme rainfall or a lack of maintenance); AND EITHER 10. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year-6-hour event, including an allowance for climate change. 11. Any additional predicted volume run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques. OR (only where criteria 10 and 11 for this credit cannot be achieved): 12. Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options. 13. Drainage design measures are specified so that that post-development peak run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: a. the pre-development one-year peak flow rate b. The mean annual flow rate (Qbar) c 2L/s/ha. For the one-year peak flow rate, the one-year return period event criterion applies. 14. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place. 15. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.	AECOM		

Title	Credit Ref	Credits available	Route to Excellent (min. 70%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments and Design Stage Evidence Requirements
Pol 04: Reduction of Night Time Light Pollution									
	Pol 04-01	1	1		1	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 alternatively, where the building does have external lighting one credit can be awarded as follows: 2. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (LP) Guidance notes for the reduction of obtrusive light, 2011. 3. All external lighting (except for safety and security lighting) can be 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. Illuminated advertisements are designed in compliance with IPL PLG05 The Brightness of Illuminated Advertisement.	BDP M&E		Awarded
Pol 05: Reduction of noise pollution									
	Pol 05-01	1	1		1	1. There are no noise-sensitive areas within the assessed building or within 800m radius of the assessed site. OR 2. Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800m radius of the assessed site, a noise impact assessment compliant with BS4142:2014 is commissioned. Noise levels must be measured or determined for: a. Existing background noise levels: i. at the nearest or most exposed noise-sensitive development to the proposed assessed site. ii. Including existing plant on a building, where the assessed development is an extension to the building. b. Noise rating level from the assessed building 3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant. 4. The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least 5dB lower than the background noise throughout the day and night. 5. If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion.	Hoare Lea		Awarded
						5. If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion.	Willmott Dixon		

Appendix 2: Energy Statement

The Manchester College

City Centre Campus

Energy report (BRUKL 2013)

Doc No: CC-BDP-XX-XX-RP-MEP-0002
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Revision	Date	Description	By	Approved
P02	24/9/2019	Stage 3	Spyros Akritidis	
P03	25/9/2019	Stage 3	Spyros Akritidis	C Yates
P04	14/10/2019	Stage 3 redesign	Spyros Akritidis	C Yates
P05	24/12/2019	Stage 4	Spyros Akritidis	C Yates
P06	28/01/2020	Stage 4	Spyros Akritidis	C Yates
C01	07/02/2020	Stage 4	Spyros Akritidis	
C02	13/03/2020	Stage 4	Spyros Akritidis	C Yates

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Executive summary

- An 'A' (24) rated EPC can be achieved with 34.5% betterment of Part L 2013.
- Prerequisite BREEAM "Excellent" under ENE01 is achieved (2018 version).
- Compliance with Policy EN 6 Target Framework for CO₂ reductions from low or zero carbon energy supplies of the Manchester Core Strategy 2012 to 2027 has been achieved.
- The current model includes a PV array of 500m² on the roof. As the servicing strategy and particular efficiencies are more specifically determined, there may be scope to reduce the PV requirement. This will however, reduce the EPC rating.
- Other key features include:
 - The teaching areas, studios, workshops, rehearsal rooms and PC suites are served by a hybrid in room VRF ASHP split system with FCU's
 - The atrium benefits from underfloor heating and cooling (tempered air at no more than 10 l/s/p)
 - Ground floor studios, control rooms, live rooms and the studio theatre (acoustic rooms) are served by an air-cooled chiller.
 - Low Specific Fan Power (SFP) and demand control
 - Low terminal unit SFP for the in-room fan coil units
- It should be noted that the Part L model assumes a lighting efficacy of 90 luminaire lumens per circuit watt.
- Please refer to the Technical Note for additional clarification regarding the input data used.

Introduction

BDP has been commissioned to perform a Building Regulations Part L2A (2013) assessment of the City Centre Campus (the 'Project') for the Manchester College (the 'Client'). The Project is located on the former Boddingtons site close to Manchester City Centre.

The purpose of this report is to establish a strategy to adhere to Part L. This is done taking into account the Project's anticipated usage, architecture, and HVAC servicing strategy.

Tools and Methods

A dynamic simulation model (DSM) approved by DCLG for Part L2A calculations was used.

- Network airflow was not modelled
- Near field shading (local buildings) have been modelled
- Note that the current model follows a low resolution 'massing' convention. That is, rather than capturing every space in detail the model is defined in generic blocks
- HVAC was modelled with basic 'Apache systems'

Software used: IES Virtual Environment 2018

The analysis was undertaken by a Building Physicist and was supervised by a CIBSE accredited Low Carbon Energy Assessor (LCEA).

Design Inputs

Weather data

The Test Reference Years (TRY) are synthetically generated from average months selected from a historical baseline of 1984 to 2004. The CIBSE 2005 TRY for Manchester was used for the purpose of this report, as per NCM requirement.

Geometry

- The geometry was based on the P21 Architectural information from by Bond Bryan and Simpson Haugh, using the current drawings as they were provided on 18th November 2019.
- The development comprises of one central facility.
- The facility consists of four levels and facilitates:
 - social areas, classrooms, two theatres, kitchens and plant rooms on the ground floor
 - communal study areas, kitchen, social areas, dining areas on the first floor
 - computer rooms and offices on the second floor
 - computer rooms and workshops on the third floor
 - classrooms on the fourth floor
 - toilets, stores and circulation areas in all floors
- The following images of the 3D model attempt to show the full geometry. As with any modelling exercise, some approximations had to be made, but care has been taken to ensure the scale and internal dimensions of the model are as close as practicable to the most recent design drawings, and that glazing areas etc. are accurately represented.
- Nearby buildings have also been modelled

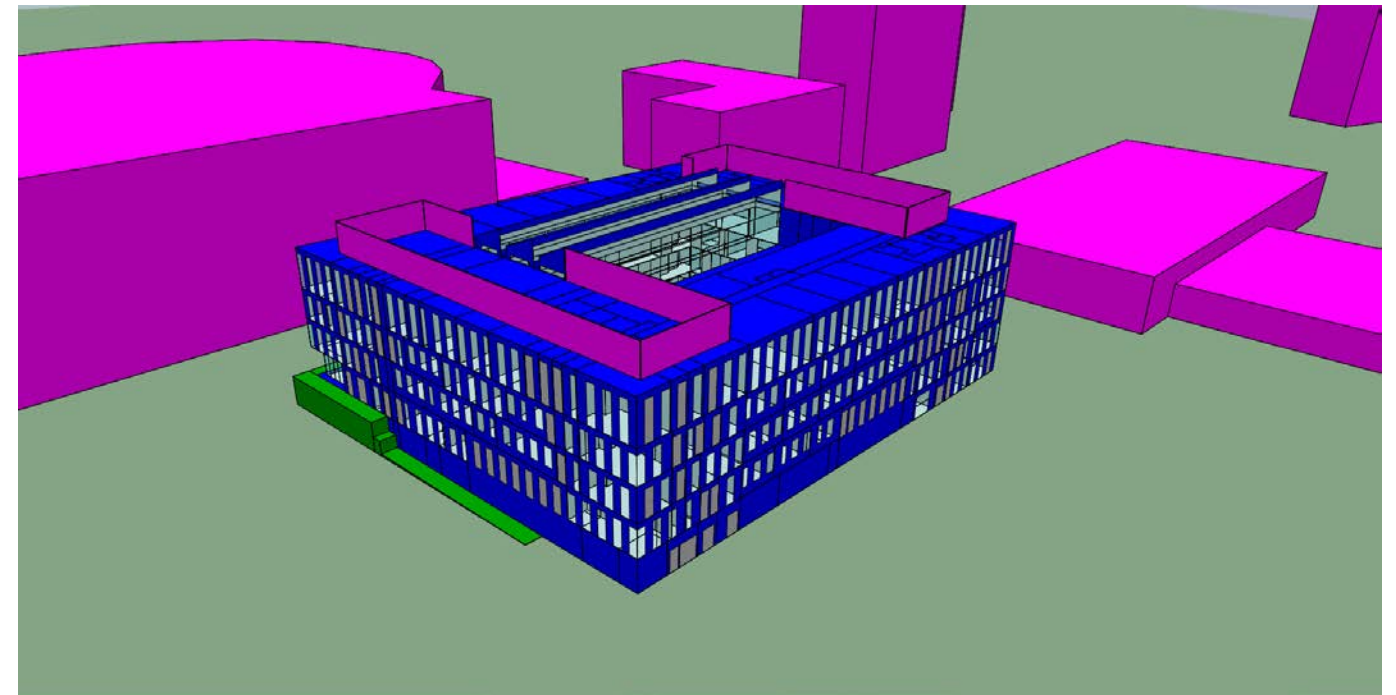


Figure 2: View from North East of analysis model

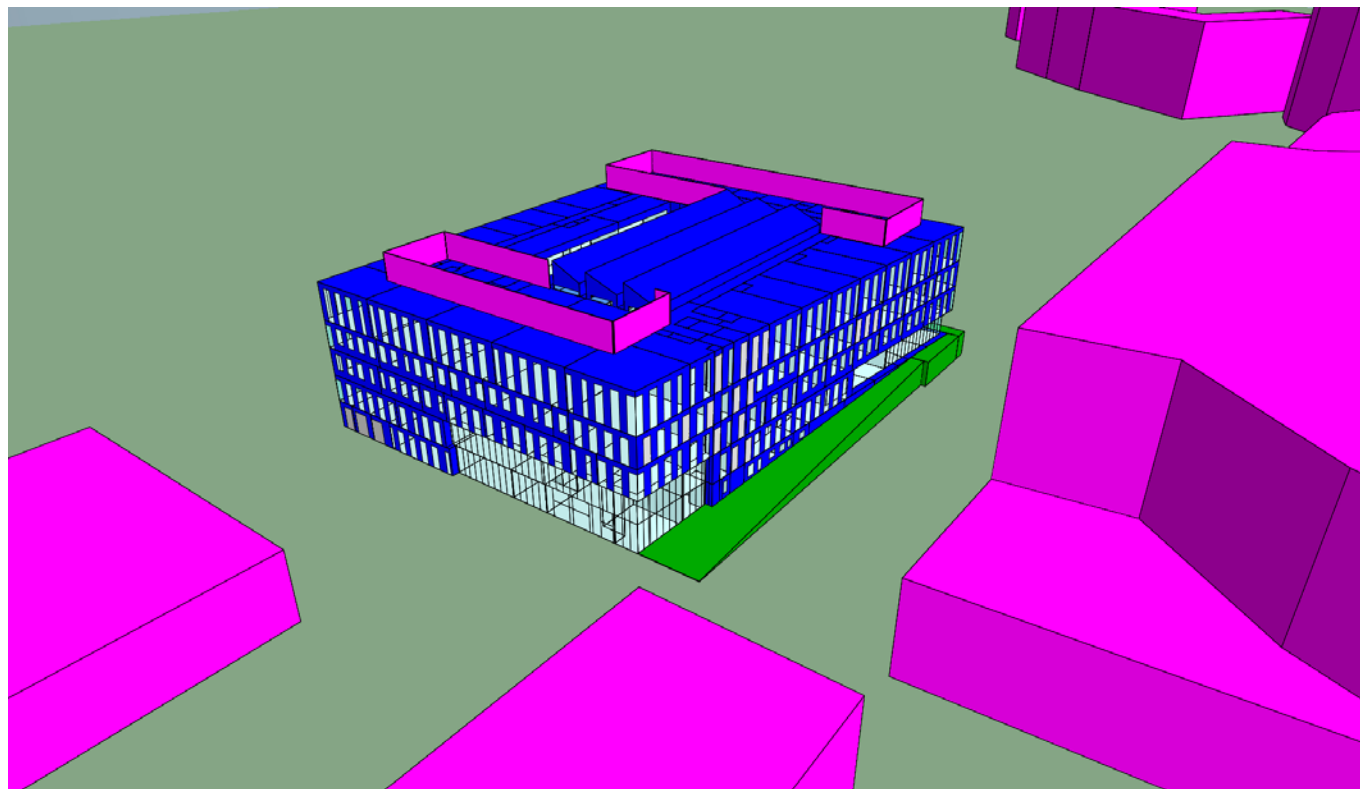


Figure 1: View from South West of analysis model

Envelope and constructions

Fenestration and solar shading

The strategy depends on spectrally selective solar control glazing. In comparison to reflective or absorptive solar control, spectrally selective glazing retains a relatively neutral appearance (it’s usually slightly tinted) whilst simultaneously filtering out solar gain and allowing daylight in.

The following table summarises the properties of the windows and roof lights used in the IES-VE model.

		U-value (glazing + framing)	g-value	Light transmission	Frame factor	Blinds
A	Curtain walling around the two entrances	1.27	0.28	0.58	7%	NO
	Atrium saw tooth roof					
	Roof light over the arts class rooms					
B	Punched windows	1.27	0.31	0.59	10%	NO

Blinds

- Blinds can be used by occupants to control glare and comfort
- Blinds do not form part of this analysis

Opaque construction elements

Element	Description	u-value
External walls	Generic well insulated SFS system (not curtain wall), generally applied to circulation and W/C core locations.	0.15
Back-painted windows	Infil panels, spandrels.	0.66, 0.92
Internal floor/ceilings	Ceiling finish (gyproc) concrete slabs 100thk. Assumed finishes: raised access floor	1.1
Roof	Insulated Concrete Deck and Steel Frame atrium roof	0.15
Ground	Edge insulated ground slabs. U-values of ground slab to be calculated in accordance with BS EN ISO 13370.	0.15
Internal partitions – light	Generic lightweight stud partitions.	1.8
Internal partitions – heavy	Higher mass internal partition representing walls between open spaces, WC/circulation cores and theatres.	1.1

Air permeability

- Air permeability was set at 5 m³/h/m² @ 50 Pa
- The CIBSE TM23: Testing Buildings for Air Leakage method was used to model infiltration

HVAC

- The teaching areas, studios, workshops, rehearsal rooms and PC suites are served by a hybrid in room VRF ASHP split system with FCU's
- Ground floor studios, control rooms, live rooms, and the studio theatre are served by an air-cooled chiller.
- The atrium benefits from underfloor heating and cooling (tempered air at no more than 10 l/s/p)
- The main theatre is served by duct mounted heating and cooling coils
- IT and server rooms are cooled by DX split systems
- Circulation areas, kitchens, toilets, store rooms and plant rooms are served by LTHW radiators

VRF	
NCM Type	Split or multi-split system
Heating Generation	Heat pump (air source)
Seasonal COP (kW/kW)	5.7
Seasonal EER (kW/kW)	9.45
Cooling/Ventilation Mechanism	Air conditioning (heat pump)
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	AHU01 - AHU04 (see table below)

DX – IT Hubs	
NCM Type	Split or multi-split system
Heating Generation	Heat pump (air source)
Seasonal COP (kW/kW)	4.4
Seasonal EER (kW/kW)	6.5
Cooling/Ventilation Mechanism	Air conditioning (heat pump)
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	AHU01 - AHU04 (see table below)

LTHW Radiators / Mechanical Ventilation	
NCM Type	Central heating using water (radiators)
Heating Generation	Gas boiler
Generator seasonal efficiency	91% (boiler)
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	AHU01 - AHU04 (see table below)

Underfloor Heating / Mechanical Ventilation - Atrium	
NCM Type	Central heating using water (floor heating)
Heating Generation	Gas boiler
Generator seasonal efficiency	91% (boiler)
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)

Theatre System	
NCM Type	Constant Volume System (variable fresh air rate)
Heating Generation	Heat pump (air source)
Seasonal COP (kW/kW)	3.75
Seasonal EER (kW/kW)	4.75
Cooling/Ventilation Mechanism	Air conditioning (heat pump)
Vent Heat Recovery Eff.	Thermal Wheel, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	As per AHU05 (see table below)

Acoustic Rooms - Single Duct VAV	
NCM Type	Single duct VAV
Heating Generation	Gas boiler
Generator seasonal efficiency	91% (boiler)
Seasonal EER (kW/kW)	5.04
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	As per AHU01 - AHU04

Ventilation System	SFP W/(l/s)	Vent Heat Recovery Efficiency (%)
AHU 01-04	2	75
AHU 05 - Theatre	1.46	75
SF 01-02 Makeup air Kitchens	2.5	75
SF 03-04 LEV Makeup air	0.7 (supply) 1.2 (exhaust)	75

The floor area treated by the above systems is presented in the following Table, as they were assigned in the IES VE model.

NCM System	Floor Area (m²)
Acoustic Rooms - Single Duct VAV	5.9%
DX – IT Hubs	0.8%
None	3.1%
LTHW Radiators	30.6%
Theatre System	1.8%
Underfloor Heating	5.7%
VRF	52.1%

Domestic Hot Water

- Domestic Hot Water is provided by high efficiency gas fired boilers with a delivery efficiency of 90%

Lighting

- Lighting is set to achieve lighting efficacy of 90 luminaire lumens per circuit watt
- Occupancy sensing is assumed to automatically turn lights off in all occupied spaces except for the kitchen
- Photoelectric dimming in all areas with a significant amount of external glazing

Other settings

- Power factor corrected for any inductive loads to be > 0.95
- BMS shall be configured for Automatic Measurement and Targeting of lighting and HVAC system energy usage

NCM Template Zone Selection

The selection of the NCM template for each room is based on the FF&E floor plans, as provided by Bond Bryan (25/11/2019). In cases where there was an ambiguity or an NCM template was not regarded as appropriate, the closest to that type, in regards of characteristics (e.g. occupancy, hot water consumption etc.), was assigned. The percentage of floor area for each NCM activity and system type is displayed in the next Tables.

NCM Activity	Floor Area (m²)
-	3.1%
NCM C2Uni: Changing facilities	0.2%
NCM C2Uni: Circulation area	22.5%
NCM C2Uni: Classroom	16%
NCM C2Uni: Communal area	1.9%
NCM C2Uni: Cupboard	3.4%
NCM C2Uni: Eating/drinking area	2.5%
NCM C2Uni: Food preparation area	1.8%
NCM C2Uni: Hall/lecture theatre/assembly area	6.6%
NCM C2Uni: Hall/lecture theatre/assembly area (Performance)	2.7%
NCM C2Uni: High density IT work space	13.7%
NCM C2Uni: Laundry	0.1%
NCM C2Uni: Light plant room	0.6%
NCM C2Uni: Office	8.0%
NCM C2Uni: Reception	0.2%
NCM C2Uni: Tea making	0.8%
NCM C2Uni: Toilet	3.7%
NCM C2Uni: Workshop - small scale	12.3%

Low and zero carbon technologies

To enable the proposals to achieve the targeted ENE01 BREEAM credits, the scheme utilises the hybrid in room VRF ASHP split system with FCU's. This benefits from excellent SCoP's and SEER's available from the Air source heat pump source, rather than a traditional chiller and LTHW boiler source and all the auxiliary energy required to pump the water around the building.

A solar PV array of 500m² has been assumed to be able to fit onto the roof, with the following characteristics:

- Size: 500 m²
- Orientation (° clockwise from North): 180°
- Inclination (° from horizontal): 0°
- PV panel nominal efficiency: 19%
- DC + inverter losses: 15%
- Location: Mounted on the main roof

Results

Criterion 1

Based on the inputs in this report, the proposed design was found to comply with Criterion 1 of Part L2A (2013), see below:

	(kgCO ₂ /m²/annum)		Improvement (%)
	BER	TER	
This project	14.899	22.734	34.5%

- The building achieves an improvement of 34.5% over Part L 2013

Energy Performance Certificate (EPC)

- The design yields an Asset rating of 24 (24.27) , an 'A' rating
- Note that a 'B' rating will result if the asset rating rounds up to 26 (i.e. 25.5 and greater)**

Manchester Core Strategy 2012 to 2027

- The 34.5% improvement over part L 2013 is equivalent to an improvement of 43.5% over Part L 2010. Thus, it is compliant with Policy EN 6 Target Framework for CO₂ reductions from low or zero carbon energy supplies of the Manchester Core Strategy 2012 to 2027 (15% over Part L 2010).
- The requirements of EN 4 Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development has also been addressed, as the proposed energy hierarchy was applied.

BREEAM ENE 01, Energy & Carbon

The results have been input into the latest updated BREEAM reporting tool and yield the following results:

- EPR-NC: 0.542
- Credits: 5
- Prerequisite for 'Excellent' (4 credits for Ene01) met

Criterion 3 – Solar gains

Reasonable provision for adhering to criterion 3 is to use the compliance check within the accredited compliance software.

- The results indicate that seven spaces fail to pass the solar gains check. Further investigation will be undertaken for these spaces at the next stage.

Zone	Solar heat gain exceedance
4.49-04_Rehearsal Rm - Drama	14.7%
4.07-04_Rehearsal Rm - Flexible	14.6%
4.19-04_Rehearsal Rm - Flexible	26.5%
4.15-04_Rehearsal Rm - Flexible	28.3%
4.12-04_Assessment Studio	22.3%
4.13-04_Rehearsal Rm - Flexible	27.3%
4.05-04_Rehearsal Rm - Flexible	12.3%
4.02-04_Rehearsal Rm – Large	17%
4.01-04_Rehearsal Rm - Flexible	10.3%
0.31-00_Front Reception	81%
0.32-00_Reception & Box Office	7.2%
0.35-00_Restaurant	97.5%
1.14-01_LRC	44.8%
1.CD01-01_Circ.	19%
4.53-04_Audio Control	5.9%
4.03-04_Rehearsal Rm - Flexible	14.3%
4.04-04_Rehearsal Rm - Flexible	14.2%
4.06-04_Rehearsal Rm - Flexible	15.4%
1.06-01_Social Dining	56.4%

Appendix A – Screen capture of EPC

Energy Performance Certificate

Non-Domestic Building

Address 1

Address 2

Address 3

Address 4

Manchester

Postcode

Certificate Reference Number:

0000-0040-0030-9000-0803

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO₂ emissions

A0-25

24

This is how energy efficient the building is.

B26-50

C51-75

D76-100

E101-125

F126-150

GOver 150

Less energy efficient

Technical information

Main heating fuel:

Natural Gas

Building environment:

Air Conditioning

Total useful floor area (m²):

18394.584

Building complexity (NOS level):

5

Building emission rate (kgCO₂/m² per year):

14.9

Primary energy use (kWh/m² per year):

99.86

Benchmarks

Buildings similar to this one could have ratings as follows:

37

If newly built

99

If typical of the existing stock

Appendix B – BREEAM

BREEAM UK New Construction 2018 Assessment Report: Assessment Issue Scoring

BREEAM® UK
delivered by bre

Man	H&W	Energy	Transport	Water	Materials	Waste	LU&E	Pollution	Innovation	
ENERGY			Ene01	Ene02	Ene03	Ene04	Ene05	Ene06	Ene07	Ene08
Ene 01 Reduction of energy use and carbon emissions										
No. of BREEAM credits available				13	Available contribution to overall score				8.67%	
No. of BREEAM exemplary credits available				5	Minimum standards applicable				Yes	
Country of the UK where the building is located				England						
Assessment Criteria				Actual	Notional					
Photovoltaic systems				3.780	0.000	kWh/m ²				
Wind turbines				0.000	0.000	kWh/m ²				
CHP generators				0.000	0.000	kWh/m ²				
Solar thermal systems				0.000	0.000	kWh/m ²				
Building energy demand				86.500	101.413	MJ/m ² yr				
Building primary energy consumption				99.861	135.660	kWh/m ² yr				
Building CO ₂ -eq emissions				14.899	22.734	KgCO ₂ -eq/m ² yr				
Does this building contain areas that require a SAP assessment?										
What % of the building's total floor area (GIA) does it apply to?										
SAP Building energy demand						MJ/m ² yr				
SAP Building primary energy consumption						kWh/m ² yr				
SAP Building CO ₂ -eq emissions						KgCO ₂ -eq/m ² yr				
Building Score										
Total BREEAM credits achieved				5						
Heating and cooling demand energy performance ratio (EPR _{dem})				0.129						
Primary consumption energy performance ratio (EPR _{pc})				0.196						
CO ₂ -eq energy performance ratio (EPR _{CO₂-eq})				0.217						
Overall building energy performance ratio (EPR _{nc})				0.542						
% improvement over building regulations (CO ₂ -eq)				34.46%						

Appendix C – Passive design note

Date: 07 February 2020
Project Name: Manchester College City Centre
Job No/File Ref: P3000166
Author: Spyros Akritidis (Building Physicist MEng, MSc) – supervised by Chris Yates C Eng MCIBSE LCEA (CIBSE accredited Low Carbon Energy Assessor (LCEA))

Circulation: Mia Coleman BDP

ENE 04-01: Passive Design Analysis

This note has been prepared to outline the evidence for the targeted BREEAM ENE04 credits for the proposed Manchester College City Centre development, as part of the redevelopment of former Boddingtons site close to Manchester City Centre.

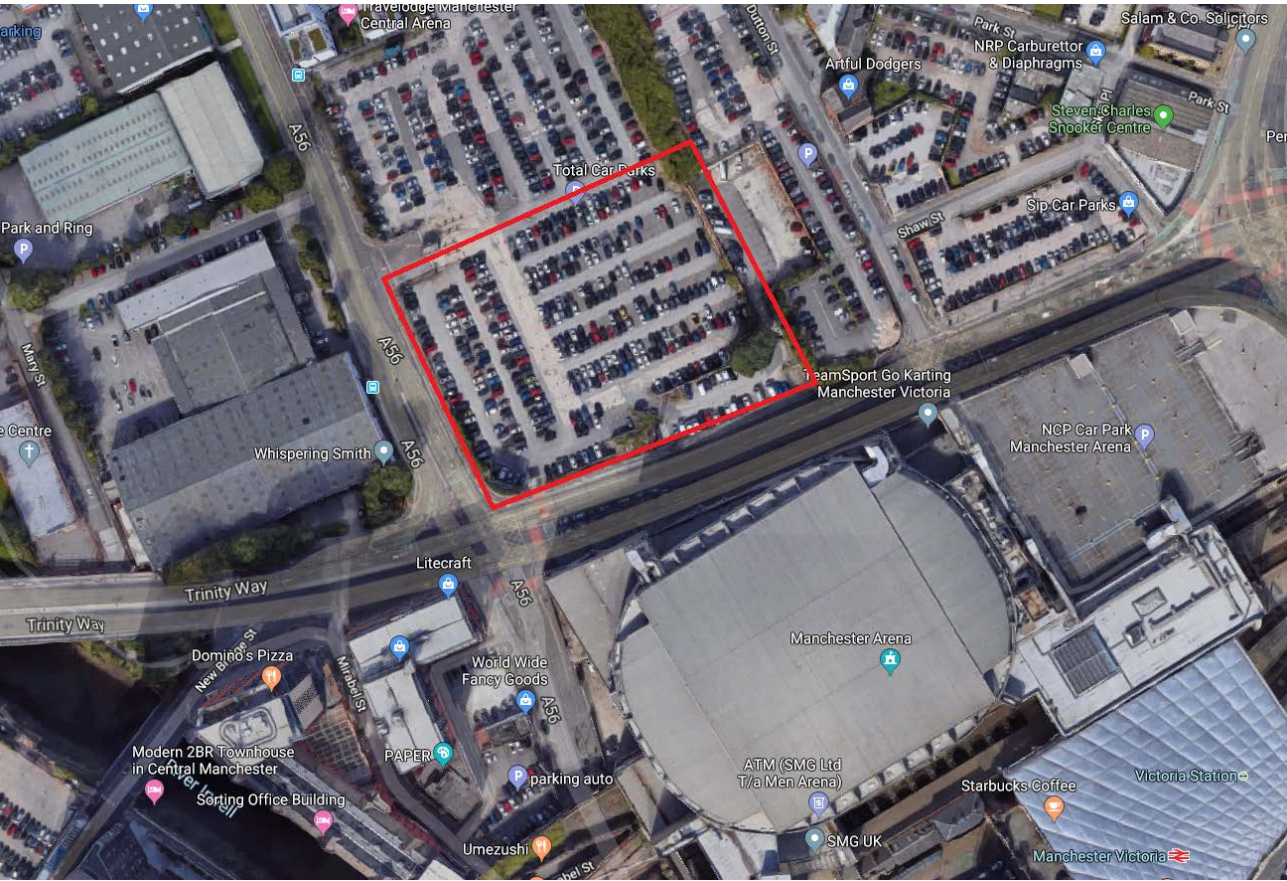


Figure 1: MC City Centre Campus location

The scheme proposes the replacement of former Boddingtons site with a new, economically and environmentally, efficient university building (approx. 22,000 m² over 6 floor levels).

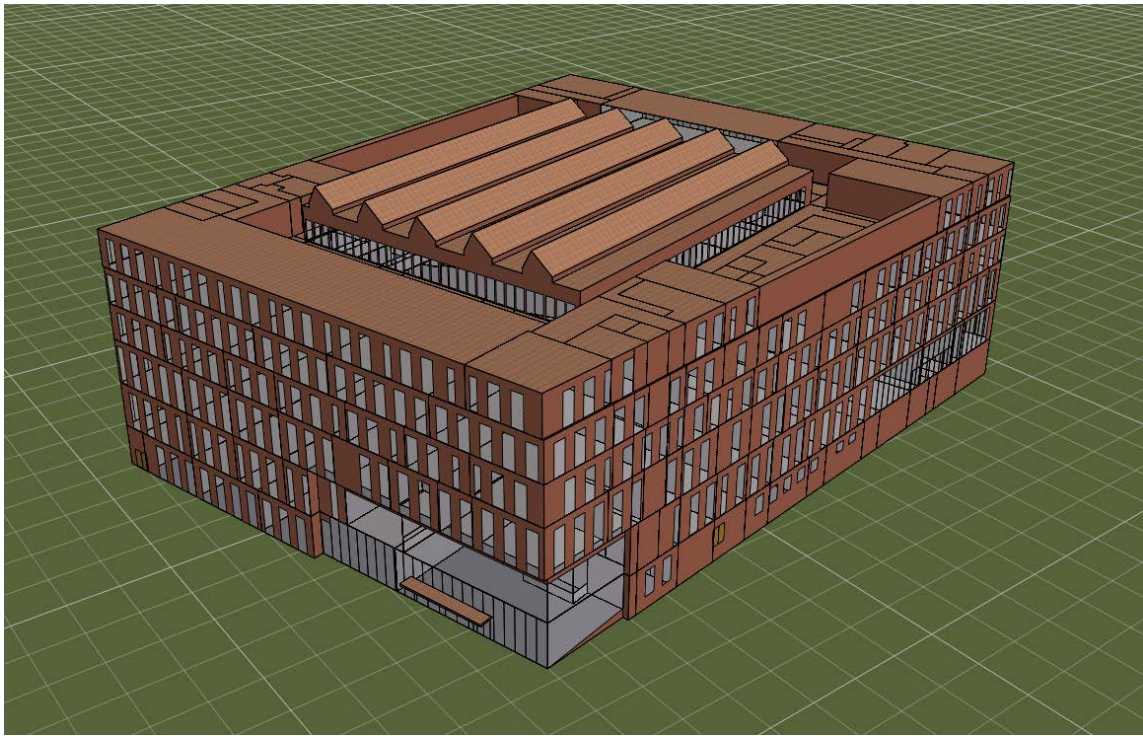


Figure 2: View from South West of analysis model – Stage 2 model.

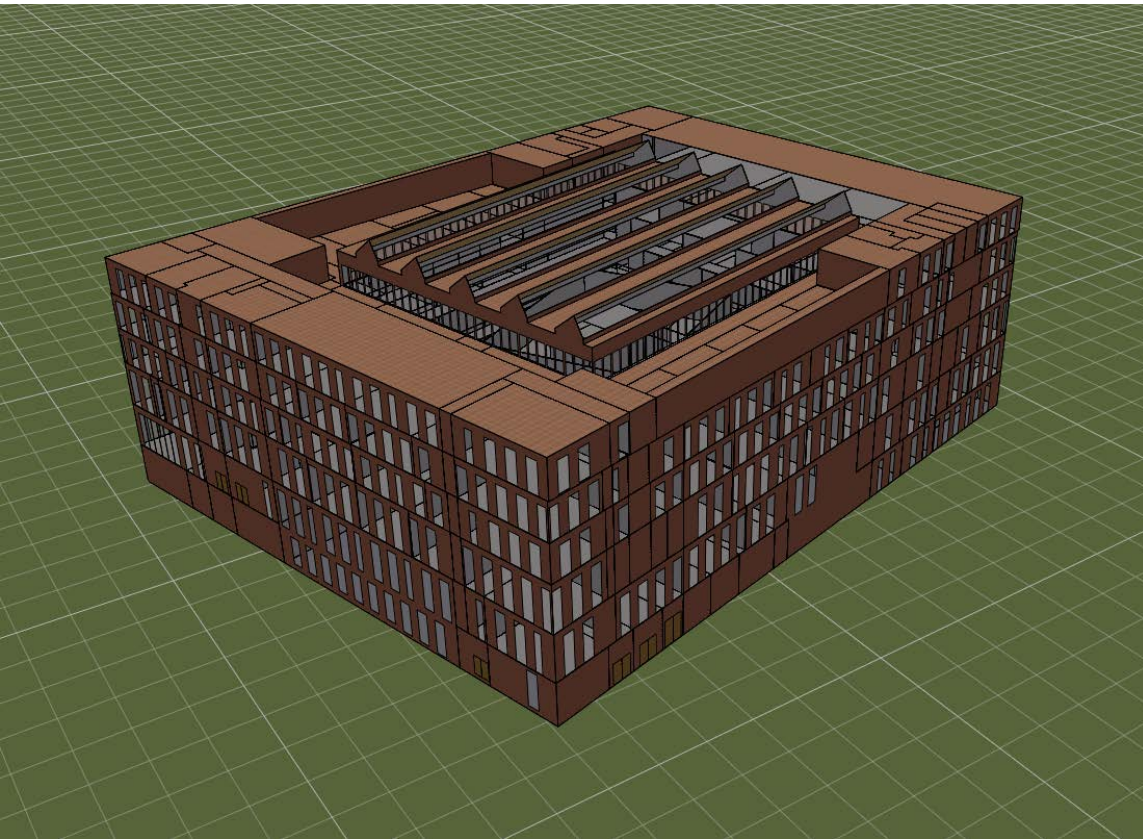


Figure 3: View from North East of analysis model – Stage 2 model.

The project team carried out an analysis of the existing building fabric, form, site location and outline scheme design to influence decisions made during the Concept Design (RIBA Stage 2) and identify opportunities for the implementation of passive design solutions that reduce demands for energy consuming building services.

This note include extracts from the various Project documents issued to the either prior to Stage 2, or as part of the Stage 2 submission.

Passive Design solutions were carefully considered from the outset of the Project throughout the Feasibility Study and Stage 2 Design process. This included careful consideration of the existing building fabric and orientation to assist in reducing the energy consumption from building services. The summary below lists the passive design areas analysed.

1. Site Location:

The site is an urban location in Manchester city centre on Great Ducie Street, opposite the Manchester Arena. There can be noise and air quality issues surrounding the site, arising from the nearby traffic, which could cause issues in promoting elements of passive design such as natural ventilation.

2. Site Weather:

The location provides a temperate Oceanic climate with mild summers and cool winters (typical for the British Isles). Precipitation levels are also typical of urban conditions in most UK towns with the potential for year-round storms and wet weather.

3. Microclimate:

The urban location also has an impact on the local microclimate with urban heat island effects increasing the external summertime temperatures above normal temperate ranges. This will also need to be considered in the internal conditioning of spaces and limit the effectiveness of some passive solutions.

4. Building Layout:

The building is a proposed new facility with its layout currently based around one central core (i.e. atrium), consisting of public assembly and circulation areas. This central core is surrounded in all orientations mainly by classrooms, offices and workshops on all five floors. The location of most of those rooms is at the building perimeter, which allows for access to natural daylight. According to the SLL Lighting Guide 10, as a rule of thumb, natural daylight will penetrate a room to a distance of about 2.5 times the window head height. The window height is 3.675m and the average depth of the office areas is about 10m, meaning that there should be enough provision of daylight.

5. Building Orientation:

The proposals need to work with this set orientation, so it is not possible to adjust this. However the design was developed to promote passive measures that relate to the orientation (e.g. use solar heat gains for the heating period). As part of this report, variable solar energy transmittance values (g-values) for external glazing were considered, in order to minimise the solar heat gains that are expected to be high, due to the fact that the external glazing consists about 42% of the building envelope.

6. Building Form:

The building is a proposed new facility with its layout currently designed to fit within the city's street form. It has a rectangular shape (78m by 57m approximately) with the longest sides facing north and south. Also, the compact form of the building, being rectangular, results in a low surface-to-volume ratio due to the deep plan and large areas of four floors, meaning that there is less envelope area through which heat can escape.

7. Building Fabric:

The building fabric comprises of solid and glazed elements. Mainly, a well-insulated SFS system, spandrels and curtain wall systems are used, with the rest of the building envelope covered with fritted glazing. High specifications of insulation and high performance glazing shall be used. However, in order to decrease the impact of solar gains and glare and to increase the occupant's thermal comfort, variable solar energy transmittance values (g-values) should be considered.

8. Thermal Mass:

Thermal mass describes a material's capacity to absorb, store and release heat. Thermal mass would allow for the effective discharge of heat, accumulated during the day, evening-out variations in internal and external conditions. There are construction elements used (e.g. concrete, gypsum plaster) that contribute to high thermal mass effectiveness. In addition there are exposed concrete ceiling surfaces (e.g. stairs) that increase the effectiveness of the thermal mass.

9. Building Occupancy Type:

The building will mainly accommodate university classrooms, offices and workshops and consequently the building is expected to be occupied throughout the year, most likely with an extended summer break, during morning to late afternoon hours.

10. Daylighting Strategy:

The use of natural daylight is a key part of the passive design of the building. The building incorporates highly glazed areas in all orientations. Also, the impact of glare and solar heat gains, associated with increased glazing areas, should be further examined.

11. Ventilation Strategy:

The design has been developed by having mainly a mix of air-conditioned and mechanical ventilation spaces as a proposed ventilation strategy. Moreover, use of openable roof lights, as means of natural ventilation, above the atrium will be beneficial to the discharge of heat accumulated during the operation hours in summer.

12. Adaptation to Climate Change:

The proposed building has a large footprint with a large flat roof but with most of its area occupied by the above-atrium roof lights. This parameter, along with the significant height of the nearby Manchester Arena building, located opposite the south façade of Manchester College City Centre, will have an effect on the sunlight availability. The design has been developed to allow full roof access and identify significant roof areas where PV panels can be installed.

To summarise, the main area where the concept design was developed to enhance passive design solutions was directed towards providing reduced glazing g-values in order to limit solar gains and reduce cooling requirements. The following glazing specifications were used, as presented in the following Table.

Table 1: Glazing specifications regarded for the purposes of the passive design analysis

		U-value (glazing + framing)	g-value	Light transmission	Frame factor	Blinds
Clear Glass	Option 1	1.27	0.28	0.58	7%	NO
	Option 1a		0.32	0.67		
Fritted Glass	Option 2	1.27	0.27	0.51	10%	NO
	Option 3		0.31	0.59		

Clear glass is intended to be used for the following glazed elements:

- Curtain walling around the two entrances
- Atrium saw tooth roof
- Roof light over the arts class rooms

Fritted glass is intended to be used for the following glazed elements:

- Punched windows

Thermal modelling

The passive design analysis involves a comparison was made between the following results from the Actual and Notional models of the Part L simulation as described in the body of this report:

1. Heating demand (system load). This is the envelope load prior to application of plant efficiency
2. Cooling demand (system load). This is the envelope load prior to application of plant efficiency
3. Auxiliary energy consumption
4. Lighting power consumption

For the purposes of comparison, the following parameters are normalised between the Actual and Notional:

- Heating fuel is gas
- Cooling supplied by electricity
- Heating SCoP is 0.82
- Cooling SEER is 3.6

Four scenarios were investigated:

- Scenario 1: Clear glass option 1 – Fritted glass option 2
- Scenario 2: Clear glass option 1 – Fritted glass option 3
- Scenario 3: Clear glass option 1a – Fritted glass option 2
- Scenario 4: Clear glass option 1a – Fritted glass option 3

The results for all scenarios are shown in the following Tables and Figures.

Table 2: Comparison between notional building and the four scenarios – energy consumption

Energy Consumption (MWh)					
		Clear Option 1 - Fritted Option 2	Clear Option 1 - Fritted Option 3	Clear Option 1a - Fritted Option 2	Clear Option 1a - Fritted Option 3
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	285.0	342.4	331.4	334.5	339.3
Cooling	115.0	89.4	96.8	95.2	91.0
Auxiliary	67.6	70.2	70.3	70.3	70.2
Lighting	393.9	195.8	192.2	192.3	195.6
Total	861.5	697.8	690.6	692.3	696.1
Energy savings		19.0%	19.8%	19.6%	19.2%

Table 3: Comparison between notional building and the four scenarios – CO₂ emissions

CO ₂ emissions (tonnes)					
		Clear Option 1 - Fritted Option 2	Clear Option 1 - Fritted Option 3	Clear Option 1a - Fritted Option 2	Clear Option 1a - Fritted Option 3
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	61.6	74.0	71.6	72.2	73.3
Cooling	59.7	46.4	50.2	49.4	47.2
Auxiliary	35.1	36.4	36.5	36.5	36.4
Lighting	204.4	101.6	99.7	99.8	101.5
Total	360.8	258.4	258.0	257.9	258.5
CO ₂ savings		28.4%	28.5%	28.5%	28.4%

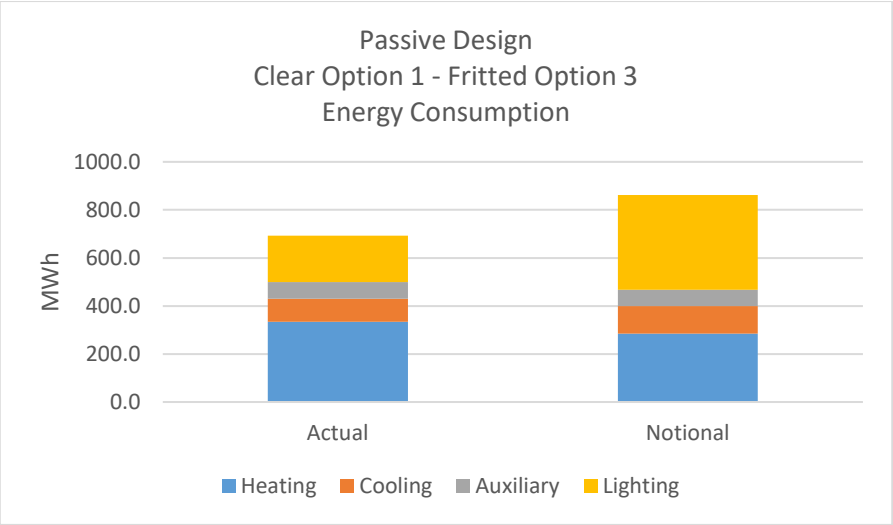


Figure 4: Comparison between actual and notional building for Scenario 2 (Clear Option 1 - Fritted Option 3) – Energy consumption

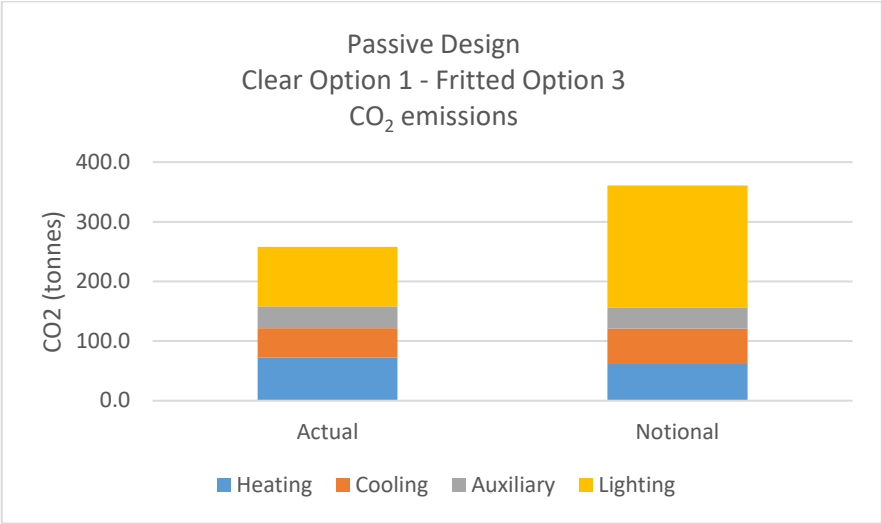


Figure 5: Comparison between actual and notional building for Scenario 2 (Clear Option 1 - Fritted Option 3) – CO₂ emissions

Table 4: Comparison the four scenarios – energy consumption (kWh/m²*yr)

Energy Consumption (kWh/m ² *yr)					
		Clear Option 1 - Fritted Option 2	Clear Option 1 - Fritted Option 3	Clear Option 1a - Fritted Option 2	Clear Option 1a - Fritted Option 3
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	15.49	18.62	18.02	18.18	18.44
Cooling	6.25	4.86	5.26	5.17	4.95
Auxiliary	3.68	3.82	3.82	3.82	3.82
Lighting	21.41	10.65	10.45	10.46	10.64
Total	46.84	37.94	37.54	37.63	37.84

Table 5: Comparison between four scenarios – CO₂ emissions (kgCO₂/m²*yr)

CO ₂ emissions (kgCO ₂ /m ² *yr)					
		Clear Option 1 - Fritted Option 2	Clear Option 1 - Fritted Option 3	Clear Option 1a - Fritted Option 2	Clear Option 1a - Fritted Option 3
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	3.35	4.02	3.89	3.93	3.98
Cooling	3.25	2.52	2.73	2.69	2.57
Auxiliary	1.91	1.98	1.98	1.98	1.98
Lighting	11.11	5.52	5.42	5.43	5.52
Total	19.61	14.05	14.03	14.02	14.05

Appendix D – Screen capture of BRUKL document

BRUKL Output Document

Compliance with England Building Regulations Part L 2013

HM Government

Project name

Manchester College - City Centre

As designed

Date: Fri Mar 13 17:29:15 2020

Administrative information

Building Details

Address: Address 1, Manchester, Postcode

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.11

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.11

BRUKL compliance check version: v5.6.a.1

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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	22.7
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	22.7
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	14.9
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	0.15	0.15	FN000000:Surf[4]
Floor	0.25	0.15	0.15	FN000000:Surf[0]
Roof	0.25	0.15	0.15	FN000021:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.27	1.5	02000012:Surf[3]
Personnel doors	2.2	0.91	2.2	FN000000:Surf[5]
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/(m²K)]
U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]
U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]

* 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	5

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	>0.95

1- Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.2	0	0.75
Standard value	0.91*	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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- DX

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.4	3.95	0	0	0.75
Standard value	0.91*	3.2	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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- Air-cooled chillers new (Copy)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	3.31	0	2	0.75
Standard value	0.91*	2.55	N/A	1.6^	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

4- VRF as Split System

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	5.7	3.5	0	0	0.75
Standard value	2.5*	3.2	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					

5- Radiators - Kitchen Prep

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.2	0	0.67
Standard value	0.91*	N/A	N/A	N/A	0.45
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					

6- Theatre - Duct Mounted Heating and Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.75	4.75	0	1.46	0.75
Standard value	2.5*	3.2	N/A	1.6^	0.65
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

7- Underfloor Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.2	0	0.75
Standard value	0.91*	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					

"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		
0.CD14-00_Escape	-	-	-	-	1	-	-	-	-	-	-	N/A
0.EX01-00_DNO SubStation	-	-	-	-	1	-	-	-	-	-	-	N/A
0.EX02-00_Private Transformer	-	-	-	-	1	-	-	-	-	-	-	N/A
0.21-00_Control Room	-	-	-	0.9	-	-	-	-	-	-	-	N/A
0.CD10-00_Lobby	-	-	-	-	1	-	-	-	-	-	-	N/A
0.19-00_Control Room	-	-	-	0.9	-	-	-	-	-	-	-	N/A
0.11-00_LiveRoom - S	-	-	-	0.9	-	-	-	-	-	-	-	N/A
0.10-00_Control Room	-	-	-	0.9	-	-	-	-	-	-	-	N/A
0.20-00_LiveRoom - L	-	-	-	0.9	-	-	-	-	-	-	-	N/A
0.CD07-00_Lobby	-	-	-	-	1	-	-	-	-	-	-	N/A
0.77-00_CIn	-	-	-	-	1	-	-	-	-	-	-	N/A
0.72-00_Make-Up	-	-	-	-	1.1	-	-	-	-	-	-	N/A
0.63-00_Machines Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.76-00_Practice Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.73-00_Band Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.74-00_Practice Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.CD06-00_Lobby	-	-	-	-	1	-	-	-	-	-	-	N/A
0.15-00_Practice Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.75-00_Practice Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.14-00_Practice Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.12-00_Band Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
0.13-00_Practice Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A
01_Control & Dimmer Room	-	-	1.1	0.9	-	-	-	-	-	-	-	N/A

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m²]	18394.6	18394.6		A1/A2 Retail/Financial and Professional services
External area [m²]	17698.1	17698.1		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	MAN	MAN		B1 Offices and Workshop businesses
Infiltration [m³/hm²@ 50Pa]	5	3		B2 to B7 General Industrial and Special Industrial Groups
Average conductance [W/K]	6163.22	7039.94		B8 Storage or Distribution
Average U-value [W/m²K]	0.35	0.4		C1 Hotels
Alpha value* [%]	9.52	10		C2 Residential Institutions: Hospitals and Care Homes
			100	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	3.85	4.49
Cooling	2.85	6.09
Auxiliary	11.55	7.79
Lighting	11.15	23.39
Hot water	13.87	12.48
Equipment*	44.88	44.88
TOTAL**	43.26	54.25

* 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	3.78	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	86.5	101.41
Primary energy* [kWh/m²]	99.86	135.66
Total emissions [kg/m²]	14.9	22.7

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

Project name

Manchester College - City Centre

As designed

Date: Fri Mar 13 17:29:15 2020

Administrative information

Building Details

Address: Address 1, Manchester, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.11

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.11

BRUKL compliance check version: v5.6.a.1

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

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	22.7
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	22.7
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	14.9
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	0.15	0.15	FN000000:Surf[4]
Floor	0.25	0.15	0.15	FN000000:Surf[0]
Roof	0.25	0.15	0.15	FN000021:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.27	1.5	02000012:Surf[3]
Personnel doors	2.2	0.91	2.2	FN000000:Surf[5]
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	5

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	>0.95

1- Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.2	0	0.75
Standard value	0.91*	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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- DX

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.4	3.95	0	0	0.75
Standard value	0.91*	3.2	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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- Air-cooled chillers new (Copy)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	3.31	0	2	0.75
Standard value	0.91*	2.55	N/A	1.6^	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

4- VRF as Split System

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	5.7	3.5	0	0	0.75
Standard value	2.5*	3.2	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					

5- Radiators - Kitchen Prep

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.2	0	0.67
Standard value	0.91*	N/A	N/A	N/A	0.45
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					

6- Theatre - Duct Mounted Heating and Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.75	4.75	0	1.46	0.75
Standard value	2.5*	3.2	N/A	1.6^	0.65
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

7- Underfloor Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.2	0	0.75
Standard value	0.91*	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* 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.					

"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			
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		Zone	Standard
0.CD14-00_Escape	-	-	-	1	-	-	-	-	-	-	-	N/A
0.EX01-00_DNO SubStation	-	-	-	1	-	-	-	-	-	-	-	N/A
0.EX02-00_Private Transformer	-	-	-	1	-	-	-	-	-	-	-	N/A
0.21-00_Control Room	-	-	0.9	-	-	-	-	-	-	-	-	N/A
0.CD10-00_Lobby	-	-	-	1	-	-	-	-	-	-	-	N/A
0.19-00_Control Room	-	-	0.9	-	-	-	-	-	-	-	-	N/A
0.11-00_LiveRoom - S	-	-	0.9	-	-	-	-	-	-	-	-	N/A
0.10-00_Control Room	-	-	0.9	-	-	-	-	-	-	-	-	N/A
0.20-00_LiveRoom - L	-	-	0.9	-	-	-	-	-	-	-	-	N/A
0.CD07-00_Lobby	-	-	-	1	-	-	-	-	-	-	-	N/A
0.77-00_Cln	-	-	-	1	-	-	-	-	-	-	-	N/A
0.72-00_Make-Up	-	-	-	1.1	-	-	-	-	-	-	-	N/A
0.63-00_Machines Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.76-00_Practice Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.73-00_Band Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.74-00_Practice Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.CD06-00_Lobby	-	-	-	1	-	-	-	-	-	-	-	N/A
0.15-00_Practice Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.75-00_Practice Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.14-00_Practice Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.12-00_Band Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
0.13-00_Practice Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A
01_Control & Dimmer Room	-	1.1	0.9	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(I/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
1.ST02-01_Stair FE1		-	-	-	1	-	-	-	-	-	-	N/A
1.13-01_W/C		-	-	-	1	-	-	-	-	-	-	N/A
1.12-01_W/C		-	-	-	1	-	-	-	-	-	-	N/A
00_Lobby ???		-	-	-	1	-	-	-	-	-	-	N/A
0.50-00_Bar		-	-	-	1.1	-	-	-	-	-	-	N/A
00_Lobby ???		-	-	-	1	-	-	-	-	-	-	N/A
0.51-00_Lobby		-	-	-	1	-	-	-	-	-	-	N/A
0.52-00_Lobby		-	-	-	1	-	-	-	-	-	-	N/A
1.34-01_Shower		-	-	-	1	-	-	-	-	-	-	N/A
1.33-01_Shower		-	-	-	1	-	-	-	-	-	-	N/A
1.CD08-01_Circ.		-	-	-	1	-	-	-	-	-	-	N/A
2.32-02_PC / Games Design		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.31-02_PC / Games Design		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.28-02_Staff		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.27-02_PC Suite / Theory		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.25-02_PC Suite / Theory		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.23-02_PC Suite / Theory		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.17-02_W/C		-	-	-	1	-	-	-	-	-	-	N/A
02_W/C		-	-	-	1	-	-	-	-	-	-	N/A
2.ST02-02_Stair FE1		-	-	-	1	-	-	-	-	-	-	N/A
2.29-02_PC Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.26-02_PC Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.24-02_PC Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.67-02_W/C		-	-	-	1	-	-	-	-	-	-	N/A
2.58-02_Mac Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.56-02_Mac Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.54-02_Mac Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.41-02_Mac Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.40-02_PC Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.71-02_Reprographics		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.39-02_PC Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.36-02_Boardroom		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.18-02_Edit Suite		-	-	-	1.1	-	-	-	-	-	-	N/A
2.19-02_Edit Suite		-	-	-	1.1	-	-	-	-	-	-	N/A
2.20-02_Edit Suite		-	-	-	1.1	-	-	-	-	-	-	N/A
2.12-02_Admin		-	-	-	1.1	-	-	-	-	-	-	N/A
2.05-02_Operation Systems Lab		-	1.1	0.9	-	-	-	-	-	-	-	N/A
2.CD01-02_Circ.		-	-	-	1	-	-	-	-	-	-	N/A
2.01-02_Mac Suite		-	1.1	0.9	-	-	-	-	-	-	-	N/A
3.16-03_W/C		-	-	-	1	-	-	-	-	-	-	N/A
3.15-03_W/C		-	-	-	1	-	-	-	-	-	-	N/A
3.ST02-03_Stair FE1		-	-	-	1	-	-	-	-	-	-	N/A
3.56-03_W/C		-	-	-	1	-	-	-	-	-	-	N/A