
Hyde Road School

Environmental Standards Statement

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TABLE OF CONTENTS

1. Introduction.....	3
2. Planning Policy and Drivers	4
3. Sustainability Design Response.....	7
3.1 Environmental Design.....	7
3.2 Energy Efficiency Measures and Renewable Energy	9
3.2.1 Be Lean	9
3.2.2 Be Clean	10
3.2.3 Be Green	11
3.3 Waterways and Water Management.....	11
3.3.1 Internal water consumption.....	11
3.3.2 External water consumption.....	12
3.3.3 Flood risk and drainage strategy.....	12
3.4 Weather resilience	12
3.5 Waste management.....	13
3.6 Construction Site Environmental Management.....	13
3.7 Green Infrastructure.....	14
4. Conclusion	15
Appendix 1: BREEAM Tracker	16
Appendix 2: Energy Strategy Report	17

1. Introduction

This Environmental Standards Statement has been produced by BDP on behalf of Sir Robert McAlpine to support the Planning submission for the new Hyde Road School development.

Working alongside the Co-op Academy and Manchester City Council, the project will provide a brand new 1,200 pupil secondary school within East Manchester, on the site of the former Showcase Cinema on Hyde Road. The design includes a number of state of the art facilities including a new sports hall, activity studio, external sports pitches, auditorium and stage facilities, large dining hall and library.

The statement seeks to address the requirements of 'A Guide to Development in Manchester and Manchester's Core Strategy (adopted 2012), demonstrating how the proposals will comply with the environmental standards set out in terms of energy efficiency, renewable energy and environmental design. The report further demonstrates how the development has sought to incorporate a number of sustainability features in order to combat climate change, in response to Manchester's declaration of a climate change emergency.

This statement should be read in conjunction with the full suite of supporting documents and drawings that form the planning application submission.

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).

The environmental standards to which the development must comply are set out within the adopted Manchester Core Strategy (2012 – 2027) and Supplementary Planning Document (SPD) *Guide to Development in Manchester* (adopted 2007). Section 4 of the SPD, "Environmental Standards", provides guidance to developers of 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)** covers a wide variety of issues relating to development, some of which are required by the aforementioned policies. For the purposes of this report, emphasis will be placed on the requirement for “new commercial developments to demonstrate best practice which will include the application of the BREEAM (Building Research Establishment Environmental Assessment Method) standards.”

3. Sustainability Design Response

The following section aims to demonstrate how the development has responded 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. This requirement highlights the need to achieve at least a 'Very Good' rating. Hyde Road has targeted a BREEAM Very Good rating however, following the recent declaration of a climate emergency and in line with the Manchester climate change targets, the project is significantly exceeding the required 55% for BREEAM Very Good, ensuring that the building is designed to be as sustainable as possible.

A BREEAM pre-assessment exercise has been undertaken by BDP Sustainability who are qualified BREEAM Assessors and Accredited Professionals. The aim of the exercise was to appraise the current design against the BREEAM New Construction (NC) 2018 Education scheme in order to establish the current anticipated score.

A BREEAM pre-assessment workshop was carried out on 18th November 2020. The workshop was attended by:

- Kat Radford, BREEAM Assessor and Accredited Professional, BDP
- Mia Coleman, BREEAM Assessor, BDP
- David Wage, Architect, Space Architects
- Lee Wayper, Architect, Space Architects
- Nick Jaszynski, Architect, Space Architects
- Paul Broadfoot, Architect, Space Architects
- Gillian Smith, Project Managers, Faithful and Gould
- Natasha Dayes, Project Managers, Faithful and Gould
- James Barker, Contractor, Sir Robert McAlpine
- Richard Slater, Contractor, Sir Robert McAlpine
- Peter McVeigh, Contractor, Sir Robert McAlpine
- Richard Binns, Contractor, Sir Robert McAlpine
- Mick McManus, Manchester City Council

Following on from this workshop it was agreed that a score of 71.15% will be targeted, thereby significantly exceeding the minimum 55% required for BREEAM Very Good. In addition to the targeted credits, an additional 47.85% worth of potential additional credits which have been identified. These "potential" credits either require further investigation or may be difficult or costly to achieve, and will be reviewed by the team throughout the project.

The strategy for achieving BREEAM 'Very Good' is summarised in Figure 1 and Table 3.

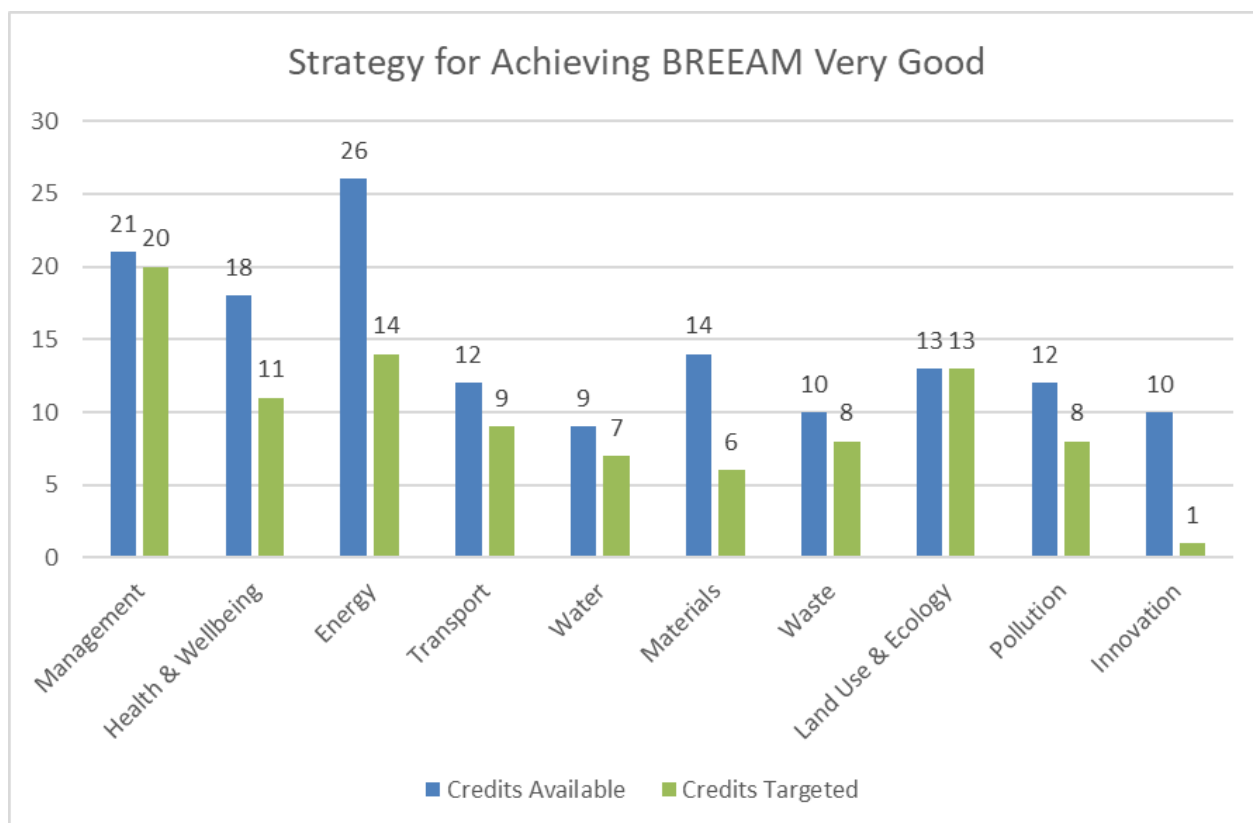


Figure 1: Route to 'Very Good'

Table 3: Route to 'Very Good'

Environmental section	No. credits available	Indicative no. credits targeted	% credits targeted	Section weighting	Indicative section score
Management	21	20	95.24%	11.0%	10.48%
Health and Wellbeing	18	11	61.11%	14.0%	8.56%
Energy	26	14	53.85%	16.0%	8.62%
Transport	12	9	75.00%	10.0%	7.50%
Water	9	7	77.78%	7.0%	5.44%
Materials	14	6	42.86%	15.0%	6.43%
Waste	10	8	80.00%	6.0%	4.80%
Land Use and Ecology	13	13	100%	13.0%	13.00%
Pollution	12	8	66.67%	8.0%	5.33%
Innovation	21	1	10.00%	10.0%	1.00%
TOTAL:					71.15%

The development is expected to score well in the following categories:

- Management:** The majority of the management credits are expected to be achieved as a result of project and contractor management processes relating to sustainability, the use of lifecycle costing exercises to inform the design, the involvement of a BREEAM Accredited Professional during the early stages, and for ensuring appropriate commissioning and testing activities will take place to ensure building services operate as expected and energy consumption is minimised.
- Transport:** The majority of credits will be achieved for this section as a result of the distance of the development to a number of local amenities, thereby reducing the need for car-based travel, providing electric vehicle charging stations, real-time public transport information in communal areas and providing cycle storage and cyclist facilities in excess of BREEAM requirements.

- **Water:** Low water consuming sanitary ware and kitchen taps as well as water metering, sub metering and leak control further secures the majority of the water category credits and will reduce potable water consumption.
- **Waste:** The principal contractor, Sir Robert McAlpine, have confirmed that waste generation will be minimised on site and the majority of waste reduced diverted from landfill. The design team have agreed that the current target for waste generation is $\leq 7.5\text{m}^2$ or ≤ 6.5 tonnes of non-hazardous construction waste generation (excluding demolition and excavation waste) per 100m^2 gross internal floor area (GIFA), although there is an aspiration to meet the higher target of $\leq 3.4\text{m}^2$ or ≤ 3.2 tonnes. Furthermore, waste-to-landfill will be reduced through the provision of appropriately sized recycling facilities.
- **Land Use and Ecology:** The ecological value of the site will be improved as a result of the development, achieving a biodiversity net gain.

For the full strategy including details of each credit, please refer to the BREEAM tracker in Appendix 1 of this report.

3.2 Energy Efficiency Measures and Renewable Energy

Compliance with Manchester Core Strategy Policies EN4, EN5, EN6 and EN7 are addressed in the Energy Strategy Report prepared by BDP MEP team for planning (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)

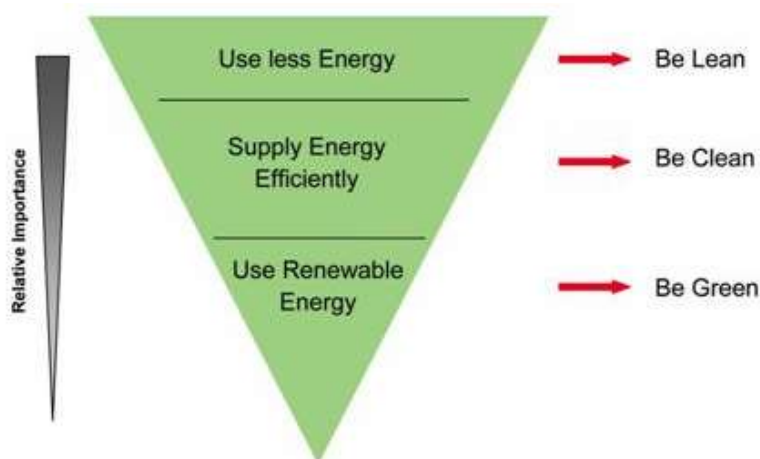


Figure 2: Energy Hierarchy

A summary of the approach for the project, alongside a description of compliance with the aforementioned policies, are summarised below.

3.2.1 Be Lean

As discussed in BDP's Energy Strategy Report, a number of passive 'be lean' measures have been adopted:

- **Orientation:** The design has been developed to promote passive measures that relate to the orientation (e.g. use of solar heat gains for the heating period). Variable solar energy transmittance values (g-values) for the external glazing were considered in order to minimise the solar heat gains.
- **Daylight and solar control optimisation:** The use of natural daylight is a key part of the passive design of the building. Natural light ingress is optimised through the glazing to the east, south and west facades. The SLL Lighting Guide 10, as a rule of thumb, states that natural daylight will penetrate a room to a distance of about 2.5 times the window head height. The window height has been designed to be 2.25m and the average depth of a typical classroom is about 7.8m, meaning that there should be enough provision of daylight at the area where the pupils are expected to be seated.
- **Natural ventilation:** Due to the location of the site and noise and poor air quality arising from the nearby traffic, a fully naturally ventilated solution is not possible. However, the design has been carefully developed to provide a mix of natural and mechanical ventilated spaces, thereby reducing the energy demand compared to a fully mechanically ventilated building.
- **Thermal mass:** 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 three floors, meaning there is less envelope areas through which heat can escape. As well as this, exposed construction elements may be considered e.g. concrete which would contribute to high thermal mass effectiveness.
- **Building fabric:** The building fabric is largely comprised of a well-insulated concrete wall system and louvres, with the rest of the building envelope covered with glazing. Well performing insulation and high performance glazing shall be used. The development seeks to exceed 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 below, thereby minimising energy demand.

Table 4: Comparison of Fabric Standards

Element	Part L 2013 Minimum Standards	Proposed Standards for Hyde Road School	Performance Relative to Part L Requirement
Roof	0.25 W/m ² .K	0.17 W/m ² .K	Improvement
Walls	0.35 W/m ² .K	0.22 W/m ² .K	Improvement
Floor	0.25 W/m ² .K	0.16 W/m ² .K	Improvement
Windows, roof windows and roof lights	2.2 W/m ² .K	1.4 W/m ² .K	Improvement
Air permeability	10m ³ /h/m ²	5m ³ /h/m ²	Improvement

The development therefore adheres to the first requirement of the hierarchy which is to reduce the need for energy through design features that provide passive heating, natural lighting and cooling.

As such the building has demonstrated compliance against the 'be lean' requirements.

3.2.2 Be Clean

'Be Clean' requires the design team to demonstrate that energy consumption has been minimised through the specification of energy efficient building services. Similar to the active passive measures described in section 3.2.1, these include:

- Highly efficient gas fired boilers with an efficiency of 95%
- Heat recovery on ventilation units with MVHR efficiency up to 75% (dry efficiency)
- Split DX system (server room) efficiency SCoP = 3.2, SSEER = 3.4
- LED lighting throughout the building with absence detection provided except for in the ground floor sports hall.
- BMS control, metering, monitoring and system zoning

3.2.3 Be Green

As per the requirements of Policy EN6 (Target Framework for CO₂ Reduction from Low or Zero Carbon Energy Supplies), developments must achieve a minimum 15% reduction in emissions (i.e. a 15% increase on Part L 2010). Since the issue of the Core Strategy, Part L 2010 has been superseded by Part L 2013 which has more stringent energy requirements. The 15% requirement translates as a 6% improvement over Part L 2013.

In line with the energy hierarchy, the required carbon emissions reductions have been achieved through lean energy efficiency measures, supplemented with a 200m² south facing array of photovoltaic panels (efficiency 19%).

The current BRUKL report (dated 22nd December 2020) confirms that the target CO₂ emission rate (TER) of 14.9kgCO₂/m².annum is bettered by 14% with a building CO₂ emission rate (BER) of 12.8 kgCO₂/m².annum, thereby meeting the requirements of Policy EN6. As well as adhering with policy EN6, this also is the final step of the energy hierarchy which involves the consideration of low and zero carbon technologies to offset carbon emissions further.

3.3 Waterways and Water Management

3.3.1 Internal water consumption

The Environment Agency has warned that, as a result of climate change and a growing population, England will face severe water supply shortages by 2050 unless rapid action is taken to curb water use and wastage.

In response to this, the proposed development shall seek to minimise potable water consumption through the provision of low-water consuming sanitary and kitchen fittings and monitoring systems (including flow control systems). These measures have the potential to reduce water consumption significantly, thereby also reducing costs.

The development is currently aiming to reduce potable water consumption by 40% compared to baseline performance. Although sanitary and kitchen fittings have not yet been specified, the following limits will be imposed in order to achieve the 40% reduction. This is in line with BREEAM criteria for 3 credits (Wat 01).

Table 5: Water consumption limits

Component	Proposed performance level (maximum)
Toilets	3.75 litre effective flush volume
Wash hand basin taps	5 litres/min
Showers	6 litres/min
Urinals	1.50 litres/bowl/hour (2 or more urinals)
Kitchen (kitchenette) taps	6 litres/min
Kitchen taps: restaurant (pre-rinse nozzles only)	7.30 litres/min
Dishwashers	12 litres/cycle (domestic sized); 5 litres/cycle (commercial sized)
Washing machines	40 litres/use (domestic scale);

In addition to reducing water consumption, water meters will be fitted to the mains supply to the building, including sub-meters to plant areas and building areas that consume ≥10% of the buildings total water demand, in line with BREEAM criteria (Wat 02), thus allowing 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) will be installed in order to minimise water leaks that may otherwise go undetected. A water leak detection system, programmed to detect major water leaks within the building and between the building utilities water supply, is also specified for the development. The leak detection system will be linked to the BMS and will alert the building occupants to any major leaks.

3.3.2 External water consumption

With regards to external applications, potable water consumption will be reduced through the specification of soft landscaping and planting that will not require permanent irrigation systems. Planting will either be watered by hand or will rely on precipitation.

3.3.3 Flood risk and drainage strategy

The site specific Flood Risk Assessment (BDP, HRS-BDP-RPT-C-001, January 2021) confirms that the development sites lies within Flood Zone 1, very low risk of flooding, and is therefore has an annual risk of flooding of less than 0.1% (see Figure 3).

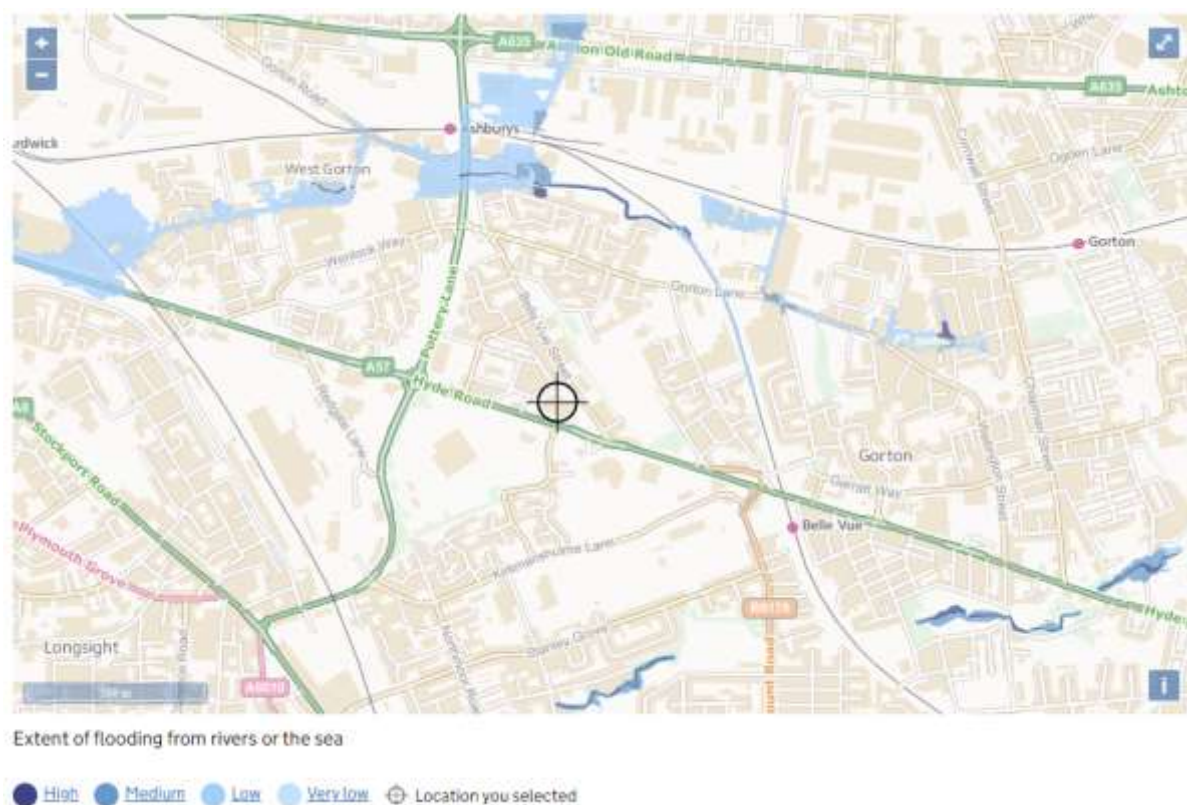


Figure 3: Environment Agency Flood Map

Policies EN14 (Flood Risk) and EN17 (Water Quality) will be covered in the Flood Risk Assessment (BDP, HRS-BDP-RPT-C-001, January 2021).

3.4 Weather resilience

Policy EN8 (Adaptation to Climate Change) requires all new developments to be designed so as to be adaptable to future climate conditions. This is becoming increasingly important as the impacts of climate change become progressively more severe and Manchester experiences increasing extreme weather events.

The impacts of climate change and weather resilience have been considered within the design, namely relating to increased temperatures and flooding.

In terms of the external environment, additional planting will provide passive shading and localised cooling, making the immediate external environment more comfortable for building users.

As discussed in section 3.3.3, the development is located within a Flood Zone 1, and the risk of flooding is very low. The Flood Risk Assessment and Outline Drainage Strategy report (BDP, HRS-BDP-RPT-C-001, January 2021) details how the risk of flooding has been considered in line with BREEAM requirements and climate change risks.

In addition, all electrical services will be located above flood levels, and the structure of the building will be designed in accordance with the relevant Eurocodes which takes into account estimated future rainfall and other extreme weather scenarios such as snowfall.

3.5 Waste management

Core Strategy Policy EN19 promotes sustainable waste management practices during design, construction and operation. The design team have agreed that the current target for waste generation is $\leq 7.5\text{m}^2$ or ≤ 6.5 tonnes of non-hazardous construction waste generation (excluding demolition and excavation waste) per 100m^2 gross internal floor area (GIFA), although there is an aspiration to meet the higher target of $\leq 3.4\text{m}^2$ or ≤ 3.2 tonnes.

With regards to operational waste, there will be a dedicated space for the segregation and storage of operational recyclable waste generated, this will be clearly labelled, accessible to the required building occupants or facilities management and appropriately sized to suit the building size.

The design team have also confirmed that, in line with BREEAM requirement for diversion of resources from landfill, more than 70% by volume / 80% by tonnage of non-hazardous construction waste will be diverted from landfill sites.

A separate waste management strategy is provided as part of the Planning submission.

3.6 Construction Site Environmental Management

Site waste management is discussed in Section 3.5 of this document. In addition to site waste reduction and the diversion of waste from landfill, the following measures are put in place to promote environmental sustainability:

- Sir Robert McAlpine operate a third party certified environmental management scheme (ISO 14001) which requires them to work to strict guidelines with regards to resource efficiency (including energy and water) and waste reduction, both on and off site.
- Sir Robert McAlpine have confirmed that they will operate and implement best practice pollution prevention policies and procedures on site in accordance with Pollution Prevention Guidelines, Working at construction and demolition sites: PPG6.
- In line with the BREEAM requirements, all timber used during the construction process will be 'legally harvested and traded timber'.
- Throughout construction, Sir Robert McAlpine will be required to monitor and report 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 (m^3) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation.
 - Transport of construction materials and waste and impacts resulting from the delivery of the majority of construction materials to site and construction waste from site.
- In response to the BREEAM NC 2018 Man 03 credit, Sir Robert McAlpine have confirmed that they will implement the following responsible construction management procedures, relevant to environmental sustainability:

- Minimise the risks of air, land and water pollution.
- Implement practices to ensure the development footprint is safe, clean and organised at all times. This includes, but is not limited to, facilities, materials and waste storage.
- Ensure ongoing training is provided for personnel and visitors (relevant to energy, water, waste and ecology).

Furthermore, the Considerate Constructors scheme shall be used on this project, committing Sir Robert McAlpine to being environmentally conscious, clean, safe and respectful to the site neighbours during the construction stage.

3.7 Green Infrastructure

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. A detailed ecological and abiotic assessment, which forms part of the this Planning application, has been undertaken in order to ascertain the ecological value of the site and identify any ecological receptors which may be present, and any constraints and opportunities that will need to be considered by the design team moving forward. It is thought that a net gain in biodiversity will be achieved on site with the introduction of green landscaping and outdoor pitches.

In line with the current BREEAM commitments, a 5 year habitat and management plan will be produced to ensure the biodiversity of the site is upheld and promoted.

Sir Robert McAlpine have confirmed that in order to promote and protect biodiversity outside of the development site, all wood and wood products will be FSC or PEFC certified.

4. Conclusion

This Environmental Standards Statement seeks 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, construction management and biodiversity. The preceding sections demonstrate how compliance with the following policies has been demonstrated:

- **Policy DM1 (Development Management):** The development has been designed in accordance with BREEAM 'Very Good' requirements. To support Manchester City Council's climate change agenda, the BREEAM assessment is targeting a score of 71.15% thereby significantly exceeding the requirements of 55% required for BREEAM Very Good certification.
- **Policy EN4 (Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development):** The energy hierarchy has been implemented, as detailed in Section 3.2, resulting in a 14% reduction in building emissions over Part L 2013. This exceeds the 6% requirement.
- **Policy EN6 (Target Framework for CO₂ Reduction from Low or Zero Carbon Energy Supplies):** A 200m² PV array forms part of the specification.
- **Policy EN8 (Adaptation to Climate Change):** Adaptation to climate change is considered throughout the report, e.g. reduction of energy demand and carbon emissions, however additional adaptation measures including thermal comfort and flood risk are considered.
- **Policy EN9 (Green Infrastructure):** It is thought that a net gain in biodiversity will be achieved on site with the introduction of green landscaping and outdoor pitches.
- **Policy EN14 (Flood Risk):** The development is within Flood Zone 1, and therefore there will be a very low risk of flooding and it is thought that the development will not increase flood risk.
- **Policy EN17 (Water Quality):** The strategy for the disposal of surface water will be outlined in the drainage strategy which is a separate report submitted as part of this planning submission. The contractor will also ensure pollution does not enter the local watercourses through adherence with PPG6 guidelines.
- **Policy EN19 (Waste):** A separate waste management strategy is being produced as part of this Planning submission, however the contractor will ensure that construction waste is minimised with a current waste generation target of ≤7.5m² or ≤6.5 tonnes of non-hazardous construction waste generation (excluding demolition and excavation waste) per 100m² gross internal floor area (GIFA)). At least 70% of waste by volume / 80% by tonnage will be diverted from landfill, in line with WRAP guidance.

In addition to local policies, the report further takes into account the recent declaration of a climate emergency in Manchester, listing a number of sustainability features designed into the project to not only reduce carbon emissions, but to future proof the development in terms of changing weather patterns, water shortages, and loss of biodiversity.

Moving forward, the design team and principal contractor shall continue to embed the targets within the design and construction of the development, therefore adhering to the requirements of the aforementioned policies.

Appendix 1: BREEAM Tracker

Targeted
Not targeted / Cannot be achieved
Evidence received / Awarded

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
MANAGEMENT (1 credit = 0.52%)									
Man 01: Project brief and design									
Project Delivery Planning	Man 01-01	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 c. Communication Strategy d. Concept Design.	SRM / Design Team / Client	2	Project stakeholders include the following: Client, the building occupier, the design team and the principal contractor. Contractors' involvement ensures their input in terms of formulating sustainable design solutions, commenting or inputting on the practicality and buildability of (one or more) design solutions and their impact on programming, cost etc. BREEAM recognises that traditionally for some projects, the contractor for the works is not appointed at the early project stages and therefore compliance with this criterion would not be possible. In these instances, to ensure the aim of the criteria is upheld, the criterion is met if a suitably experienced person with substantial construction or contracting experience in projects similar to the proposed works is involved prior to appointment of the contractor. A suitably experienced person could be a contractor appointed as a consultant for this stage or a construction project manager. 15.12.20: Full requirements sent to design team to ensure each point is covered. Evidence required: - Meeting minutes and / or narrative - Project programme confirming the meeting took place during RIBA Stage 2

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Stakeholder Consultation (Interested Parties)	Man 01-02	1	0	1		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.	SRM / Design Team / Client	2	Potential additional appointment required: Independent third party to undertake the consultation exercise. *Interested parties include: 1. Actual or intended building users (if known) including facilities management staff or those responsible for the day to day operation of the building grounds. 2. Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction. 3. Existing partnerships and networks that have knowledge of, and experience working on, existing buildings of the same type. 4. Potential users of any shared facilities e.g. operators of clubs and community groups. AND the following where relevant: 7. Specialist service and maintenance contractors or representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories.
						5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.	Space Architects / MEP Team		
						6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties give and receive consultation feedback.	SRM / Design Team	4	
						7. 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.	SRM / Design Team / Client	2	
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 AP	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 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			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 AP	4	BDP are appointed as BREEAM Assessor on the project and as such this credit will be achieved. Evidence required: - BREEAM AP Stage 4 report - Project programme confirming dates of RIBA Stage 4

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 02: Life Cycle Cost and Service Life Planning									
Elemental Life Cycle Cost (LCC)	Man 02-01	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.	F&G	2	Evidence required: - Elemental LCC Plan - Project programme confirming date of RIBA Stage 2 - Examples demonstrating that the LCC plan has been used to influence the building and systems design/specification to minimise lifecycle cost and maximise critical value.
						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).	F&G		
						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.	Design Team		
Component Level LCC Option Appraisal	Man 02-02	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.	F&G	4	Evidence required: - Component level LCC options appraisal - Project programme confirming date of RIBA Stage 4 - Examples demonstrating that the LCC plan has been used to influence the building and systems design/specification to minimise lifecycle cost and maximise critical value.
						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			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.	SRM		Evidence required: - Statement confirming predicted capital costs.
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'.	SRM		18.11.2020: SRM to issue timber procurement policy. Evidence required: - Specification or list of timber suppliers and associated certificates
Pre-requisite	Man 03-pre	-	-	-		2. To award any of the available credits for this issue, any party who at any stage manages the construction site (e.g. the principal contractor, the demolition contractor) operates an Environmental Management System (requirements detailed in criteria 3 below).	SRM		Evidence required: - Copy of ISO 14001 certificate (including for demolition contractor) - Statement confirming compliance with criterion 4
Environmental Management	Man 03-01	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.	SRM		
						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 Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
BREEAM AP (Site)	Man 03-02 pre	-	-	-		5. The client and the contractor formally agree performance targets.	SRM		18.11.2020: SRM have qualified BREEAM AP (Site) staff within the team.
	Man 03-02	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.	SRM		Evidence required: - Appointment document or other form of evidence confirming appointment of the BREEAM Site AP. - Meeting minutes, communication records, formal notes of conversations and other statements reporting on discussions related to performance targets and maximising performance etc. - Risks and opportunities documentation.
Responsible Construction Management	Man 03-03	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.	SRM		20.11.20: BREEAM Assessor has provided SRM with Table 4.1 of the guidance manual for reference. Both credits will be achieved either where the contractor achieves a minimum score of 35 under the Considerate Constructors Scheme or complying with criterion 9. Evidence required: - See above for examples.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Monitoring of Construction-Site Impacts	Man 03-04	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.	SRM		Evidence required: - Environmental plan, statement or other form of relevant evidence confirming compliance.
						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 date 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).	SRM		
						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).	SRM		
Exemplary Level Criteria	Man 03-Ex	1	1			23. Achieve all items in Table 4.1 of the guidance manual.	SRM		Following on from issue Man 03-02, to achieve the exemplary level credit, the contractor will adhere to all the available responsible construction management items provided in Table 4.1 of the BREEAM guidance. Much of this is covered by the CCS scheme, however there are additional issues that will require consideration. Evidence required: - (refer to issue Man 03-03 for evidence requirements)

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 04: Commissioning and handover									
Commissioning and Testing Schedule and Responsibilities	Man 04-01	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,	SRM		Mandatory for BREEAM Very Good Evidence required: - Copy of the testing/commissioning schedule or formal statement confirming that one will be produced. - Spec or statement confirming compliant commissioning will be carried out (in line with current Building Regulations etc.) - Spec or statement confirming the name of the appropriate team member who will be appointed (criterion 3). - Copy of the budget and programme of works to confirm compliance with criterion 4.
Commissioning - Design and Preparation	Man 04-02	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.	BDP MEP		Evidence required: - Appointment letter or other form of documentation identifying roles and responsibilities
Testing and Inspecting Building Fabric	Man 04-03	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.	SRM		Evidence required: - Specification, contract document or statement confirming compliance
Handover	Man 04-04	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.	SRM		Provision of a compliant building user guide is mandatory for BREEAM Very Good Evidence required: - Specification, contract document or statement confirming compliance

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 05: Aftercare									
Aftercare Support	Man 05-01	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.	SRM		Evidence required: - Specification, contract document or statement confirming compliance
Commissioning - Implementation	Man 05-02	1	1			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. 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.	SRM		Evidence required: - Copy of the testing/commissioning schedule or formal statement confirming that one will be produced. - Specification, contractor, statement, or other form of relevant documentation confirming that compliant commissioning will be carried out

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Achieved credits 1.53%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Post Occupancy Evaluation	Man 05-03	1	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.	Client		Potential additional appointment required: Independent third party to undertake the post occupancy evaluation exercise. Evidence required: - Formal statement, POE appointment document, or any other form of relevant document to confirm compliance
HEALTH AND WELLBEING (1 credit = 0.78%)									
Hea 01: Visual Comfort									
Control of Glare from Sunlight	Hea 01-01	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.	Space Architects		Compliant shading measures for meeting the glare control criteria can include: – building-integrated measures (e.g. overhangs or fins) – occupant-controlled devices such as opaque Venetian or close weave fabric blinds, (where the openness factor of blinds is 1% or less, and where the fabric light transmittance value is < 0.1 (10%)) – external shading or brise soleil. 18.11.2020: Space confirmed that glare assessments are done as standard as part of the DfE standard design. Evidence required: - Solar glare control assessment (where required) - Drawings and specification detailing locations and spec of blinds and other glare control items
Daylighting	Hea 01-02	2	0	2		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: 2 credits: In all areas, a point daylight factor of at least 2% is achieved in at least 80% of the area (and either compliance with the uniformity ratio 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.	TBC		Daylight calculations will be undertaken at an early stage to inform the design. This can be difficult to achieve in larger buildings, design team to confirm compliance.
View Out	Hea 01-03	1	0	1		5. 95% of the floor area in 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. 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.	Space Architects		Compliance with these credits should be investigated.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Achieved credits 11.15%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Internal and External Lighting Levels, Zoning and Control	Hea 01-03	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 MEP		Evidence required: - Specification
	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.	TBC		Achievement of this credit may be possible.
Exemplary Level Criteria	Hea 01-03 EX	1	0			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 MEP		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Hea 02: Indoor Air Quality									
Pre-requisite	Hea 02-Pre	-	-	-		1. A site-specific indoor air quality plan has been produced and implemented in accordance with the guidance in Guidance Note GN06. 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: i. 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.	TBC		30.11.20: BREEAM Assessor emailed David Wage to confirm who would be completing the IAQP. Evidence required: - Copy of the indoor air quality plan.
Ventilation	Hea 02-01	1	1			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 (see methodology) 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 (CO₂) 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 CO₂ levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents. 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 MEP		Evidence required: - Specification and design drawings
Emissions from Construction Products	Hea 02-02	2	0	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.	Space Architects / SRM		Although this credit will be investigated and low VOC paints and finishing products will be specified, there are currently few products available on the market that meet these requirements and as such it is currently thought the credits will not be achieved.
Post Construction Indoor Air Quality Measurement	Hea 02-03	1	0	1		5. The formaldehyde concentration indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/ m³ 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/ m³ 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/ m³) are reported via the BREEAM Scoring and Reporting Tool.	SRM		This is unlikely to be achieved if Hea 02-02 is not achieved.
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,	Space Architects		There are currently very few products available that meet the required thresholds for VOC and formaldehyde content..

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Hea 04: Thermal Comfort									
Thermal Modelling	Hea 04-01	1	1			1. Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling.	BDP MEP		Evidence required: - Thermal comfort report
						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) or the thermal environment in occupied spaces meet the Category B requirements for PPD, PMV and local discomfort set out in Table A.1 of Annex A of ISO 7730:2005. 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.			
						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.			
Design for Future Thermal Comfort	Hea 04-02	1	1			5. Criteria 1 to 4 are achieved.	BDP MEP		Evidence required: - Thermal comfort report
						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.			
Thermal Zoning and Controls	Hea 04-03	1	1			9. Criteria 1 to 4 are achieved	BDP MEP		Evidence required: - Statement or other form of relevant documentation describing how the criteria are met
						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.			
Hea 05: Acoustic Performance									
Acoustic Performance	Hea 05-01	3	2	1		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	BDP Acoustics / SRM		It is thought that at least 2 of the 3 available credits will be achieved. Evidence required: - Acoustic report - Statement from the acoustician that they are suitability qualified (in line with BREEAM criteria) - Statement, contract or other form of relevant documentation confirming post completion testing will be undertaken
						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.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Hea 06: Security									
Security of Site and Building	Hea 06-01	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.	Space Architects / SRM	2	Potential additional appointment required: Suitably qualified security specialist (see notes below). 20.11.20: BREEAM Assessor has provided SRM with the full requirements for SQSS and SNA. An SQSS is defined as an individual achieving 1–3 or 4 of the following for the purposes of compliance with BREEAM: 1. Minimum of three years' experience in a relevant security profession (in the last five years). This experience must clearly demonstrate a practical understanding of factors affecting security in relation to construction and the built environment, relevant to the type and scale of the project being undertaken. 2. Holds a qualification relevant to security. 3. Maintains a full membership to a relevant professional body, institute or certification scheme that has a professional code of conduct, to which members adhere. 4. A specialist registered with a BREEAM recognised third party licensing or registration scheme for security specialists.
						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.	Space Architects / BDP MEP		Evidence required: - Security needs assessment - Confirmation from the security consultant confirming they meet the BRE's definition of an SQSS. - Drawings, specifications or other form of relevant documentation confirming that the recommendations made in the SNA will be implemented - Project programme confirming dates of RIBA Stage 2
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.	TBC		The only currently accepted scheme is SABRE.
Hea 07: Safe and Healthy Surroundings									
Safe Access	Hea 07-01	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.	Landscape Architect / Space Architects		Evidence required: - Specification and design drawings confirming compliance.
						2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space d. Connecting to off-site paths where applicable.			
						3. Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.			
						Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply (criteria 4, 5 and 6): 4. Delivery areas are not accessed through general parking areas and do not cross or share the following: a. pedestrian and cyclist paths b. outside amenity areas accessible to building users and general public.			
						5. There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.			
Outside Space	Hea 07-02	1	1			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.	Space Architects		This will be achieved.
						7. There is an outside space providing building users with an external amenity area.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
ENERGY (1 credit = 0.61%)									
Ene 01: Reduction of energy use and carbon emissions									
Energy Performance	Ene 01-01	9	2	7		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 MEP		Evidence required: - A copy of the building regulations output document from the approved software. The output documents must be based on the design stage of analysis. - Copy of the .inp file
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.	BDP MEP		Potential additional appointment required: Consultant to undertake TM54 modelling. To achieve these credits it must be demonstrated that the operational energy performance of the building has been substantially improved.
						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.			
Exemplary Level Criteria	Ene 01-Ex	2	0	2		6. The building achieves an EPR NC ≥ 0.9 and zero net regulated CO ₂ -eq emissions.	BDP MEP		These credits require the development to be zero carbon for operational energy and achieve a 50% reduction in unregulated energy from on site LZCs.
						7. Energy generation from on-site and near-site LZC sources is sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use.			
						8. Award the exemplary credits based on the percentage of additional emissions from unregulated energy that are offset by LZC sources. (Table 6.2 guidance manual).			
	Ene 01-Ex	3	0	3		9. The building is deemed carbon negative where >100% (see Table 6.2 guidance manual) of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources.	BDP MEP		Compliance with these credits will be investigated.
	Ene 01-Ex	2	0	2		10. Achieve maximum available credits in Ene 02 Energy monitoring.	Client		
						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.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ene 02: Energy Monitoring									
Sub-Metering of End-Use Categories	Ene 02-01	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 MEP		Mandatory for BREEAM Very Good End-use categories include: 1. Space heating 2. Domestic hot water heating 3. Humidification* 4. Cooling* 5. Ventilation, i.e. fans (major)* 6. Pumps 7. Lighting 8. Small power 9. Renewable or low carbon systems (separately) 10. Controls 11. Other major energy consuming systems or plant, where appropriate. Depending on the building type, this might include for example: plant used for swimming or hydrotherapy pools; other sports and leisure facilities; kitchen plant or catering equipment; office equipment; cold storage plant; laboratory plant; sterile services equipment; transportation systems (e.g. lifts and escalators); drama studios and theatres with large lighting rigs; telecommunications; dedicated computer room or suite; server rooms; dealing rooms; covered car parks; ovens or furnaces; and floodlighting. See also CIBSE TM39: Building energy metering for further information. Evidence required: - Specification and / or drawings - Written confirmation of the systems that are responsible for at least 90% of the estimated annual energy consumption.
Sub-Metering of High Energy Load and Tenancy Areas	Ene 02-02	1	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 MEP		Function areas for education buildings include: 1. Kitchens (excluding small staff kitchens and food technology rooms) 2. Computer suites 3. Workshops 4. Lecture Halls 5. Conference rooms 6. Drama Studios 7. Swimming pools 8. Sports Halls 9. Process areas 10. Laboratories 11. High contaminant suites within laboratories 12. Controlled environment chambers 13. Animal accommodation areas 14. Data centres 15. IT work and study rooms, including IT-equipped library space and any space with provision of more than one computer terminal per 5m2. Individual sub-metering of standard classrooms or seminar rooms is not required. Evidence required: - Specification and / or drawings - Confirmation of the different function areas applicable to the development.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ene 03: External Lighting									
External Lighting	Ene 03-01	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 MEP		Evidence required: - Specification and/or drawings - Calculations confirming average efficacy (where appropriate)
Ene 04: Low carbon design									
Passive Design Analysis	Ene 04-01	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.	TBC	2	15.12.20: BDP to provide quote for the Passive Design Analysis. 30.11.20: BREEAM Assessor emailed David Wage to confirm who would be undertaking the Passive Design Analysis (additional appointment or in house). Evidence required: - Passive design analysis report - Project programme confirming dates of RIBA Stage 2 - Results from a dynamic simulation model demonstrating the reduced energy demand and CO ₂ -eq emissions from the specified passive design measures.
Free Cooling	Ene 04-02	1	0	1		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 MEP		
Low and Zero Carbon Feasibility Study	Ene 04-03	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 MEP	2	Evidence required: - LZC feasibility report - Statement confirming the analysis was undertaken by an energy specialist - Project programme confirming dates of RIBA Stage 2 - Results from a dynamic simulation model demonstrating the reduced energy demand and CO ₂ -eq emissions from the specified passive design measures. - Results from a dynamic simulation model demonstrating reductions in CO ₂ -eq emissions from the specified low and zero carbon technology. - Drawings or specification confirming the proposed LZCs are specified
Ene 05: Energy Efficient Cold Storage									
Refrigeration Energy Consumption	Ene 05-01	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 MEP		Evidence required: - Specification and drawings as required to demonstrate compliance.
Indirect Greenhouse Gas Emissions	Ene 05-02	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.	BDP MEP		Evidence required: - Specification or statement and design drawings to show compliance.

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Ene 06: Energy Efficient Transportation Systems									
Energy Consumption	Ene 06-01	1	1			1. For specified lifts, escalators and moving walks (transportation types) : 1.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 / BDP MEP		Evidence required: - Copy of the transport demand and usage analysis - Specification or other relevant evidence confirming that the transportation system with the lowest energy consumption has been specified.
Energy Efficient Features	Ene 06-02	1	1			2. Criterion 1 is achieved.	Lift Consultant / BDP MEP		Evidence required: - Manufacturer's literature and lift specification
						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.			
Ene 07: Energy Efficient Laboratory									
Design Specification	Ene 07-01	1	1			1. Engage with the client during the preparation of the initial project brief to determine occupant requirements and define laboratory performance criteria. Performance criteria will include, but not be limited to: a. Description of purpose b. Occupant or process activities c. Containment requirements and standards d. Interaction between systems e. Flexibility and adaptability of laboratory facilities. f. Any other specific requirements (for example, requirements relevant to ventilation, heating or cooling)	SRM	1	18.11.2020: It was confirmed during the pre-assessment workshop that client engagement has already been undertaken. It was also confirmed that the area of lab space is <10% and therefore issue Ene 07-02 for energy efficiency measures has been scoped out of the assessment. Evidence required: - Minutes of engagement (or any other relevant evidence to confirm compliance) - Specification statement and design drawings confirming compliance.
						2. Size the services system equipment (including ventilation supply and extract) correctly (see Definitions on page 170)	BDP MEP		
						3. Demonstrate the minimised energy demand of the laboratory facilities resulting from the achievement of the defined design performance criteria. Laboratory containment devices and containment areas (criteria only applicable to buildings containing these facilities) 4. For ducted fume cupboards specified: a. Demonstrate that the average design air flow rate is no greater than 0.16m2/s per linear meter (internal width) of fume cupboard workspace. b. Measure the volume flow rate in the exhaust duct (at the boundary of the laboratory) to take account of reductions in (inward) volume flow rate from fume cupboard leakage. c. Demonstrate that a reduction in air flow does not compromise the defined performance criteria and does not increase the health and safety risk to future building occupants.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ene 08: Energy Efficient Equipment									
Energy Efficient Equipment	Ene 08-01	2	2			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 MEP / Client		Sources of unregulated energy (for BREEAM Ene 08 purposes) include: - Swimming pool - Laundry facilities with commercial-sized appliances - Data centres - IT-intensive operating areas - Domestic-scale appliances - Kitchen and catering facilities The BRE provide a list of measures of how unregulated energy associated with the above should be reduced. Evidence required: - Statement or other form of evidence which identifies the building's unregulated energy consuming loads and their estimated contributions to demand - Evidence demonstrating that unregulated energy demand is reduced (this will depend on the source identified - assessor to provide further details)
TRANSPORT (1 credit = 0.83%)									
Tra 01: Transport Assessment and Travel Plan									
Travel Plan	Tra 01-01	2	2			1. No later than Concept Design stage, undertake a site-specific transport assessment (or statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form (in line with the BREEAM methodology). 2. The site-specific travel assessment or statement covers as a minimum: - Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities if relevant. - Travel patterns and transport impacts of future building users - Current local environments for walkers and cyclists (accounting for visitors who may be accompanied by young children.) - Reporting the number and type of existing accessible amenities, see table 7.1 in the guidance manual, within 500m of the site. - Disabled access (accounting for varying levels of disability and visual impairment). - Calculation of the existing public transport Accessibility Index. - Current facilities for cyclists. 3. Following a transport assessment (in accordance with the requirements set out in criteria 2a-2g) 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 (in line with the BREEAM methodology). 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.	WYG	2	20.11.20: BREEAM Assessor has provided SRM with the requirements for both the travel assessment and the draft travel plan. Evidence required: - Transport assessment and travel plan / draft travel plan - Project programme confirming the dates of RIBA Stage 2 - Confirmation from the building occupier that they were involved in the development of the travel plan and that it will be supported and implemented
							Client		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Tra 02: Sustainable Transport Measures									
Sustainable Transport Measures	Tra 02-Pre	-	-	-	-	1. Achieve criteria 3-5 in the Tra 01 transport assessment and travel plan Issue	Design Team		20.11.2020: Based on 1260 building users 67 cycle spaces are required.
	Tra 02-01	10	7	3	2. Identify the sustainable transport measures in table 7.4 of the guidance manual (see criterion 3 and comments section).	3. Award credits according to the Accessible Index of the project and the total number of points achieved for the options implemented. The following sustainable transport measures should be considered: 1. Accessibility Index of ≥8 2. Demonstrate an increase over the existing Accessibility Index or provide a dedicated bus service 3. Provide a compliant real-time public transport information system. 4. Provide electric recharging stations of a minimum of 3kW for at least 10% of the total car parking capacity for the development. 5. Provide compliant car sharing facilities. 6. a) During preparation of the brief, the design team consults with the local authority (LA) on the state of the local cycling network and public accessible pedestrian routes, to focus on whichever the LA deems most relevant to the project, and how to improve it. b) Agree and implement one proposition chosen with the local authority. The proposition supported by the development is additional to existing local plans and has a significant impact on the local cycling network or on pedestrian routes open to the public. 7. Install compliant cycle storage spaces. 8. Provide at least 2 compliant cyclists' facilities for the building users (including pupils) -Showers, -Changing facilities, -Lockers, -Drying spaces. 9. At least three existing accessible amenities are present where relevant for a building group. 10. Ensure a minimum of one new accessible amenity is provided. 11. Ensure more than one new accessible amenity is provided. 12. Implement one site-specific improvement measure, not covered by the options already listed in this issue, in line with the recommendations of the travel plan. Submit this for review by BRE.			The following two measures will be achieved: - Accessibility Index of ≥8 (an AI of 8.51 has been calculated) - Access to amenities. It is assumed that the following measures will be provided to secure 7 credits: - Provide a compliant real-time public transport information system. - Provide electric recharging stations of a minimum of 3kW for at least 10% of the total car parking capacity for the development. - Provide compliant car sharing facilities. - Install compliant cycle storage spaces (67 spaces required). - Provide at least 2 compliant cyclists' facilities Evidence required: - Real-time public transport information system: Specification and drawing. - EV charging points: Drawings and specification - Car sharing group: Statement or other form of relevant evidence from the building owner. - Provide compliant cycle spaces: Statement confirming numbers of staff and students and drawings. - Provide compliant cyclist facilities: Drawings
WATER (1 credit = 0.78%)									
Wat 01: Water Consumption									
Water Consumption	Wat 01-01	5	3	2		1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components.	Space Architects / BDP MEP		A minimum of 1 credit is mandatory for BREEAM Very Good Although only 1 credit is required for BREEAM Very Good, at least 3 will be targeted. Achieving additional credits is possible however this is likely to require rainwater or greywater harvesting Evidence required: - Specification - Technical specification / details for any rainwater harvesting or greywater harvesting systems
						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.			
						3. If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components.			
Exemplary Level Criteria	Wat 01-Ex	1	0	1		To achieve an exemplary performance credit: 7. Achieve criteria 1 to 4.	Space Architects / BDP MEP		
						8. The water consumption (litres/person/day) for the assessed building achieves the 65% improvement described as exemplary performance in Table 8.1 of the guidance manual.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Actual credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wat 02: Water Monitoring									
Water Monitoring	Wat 02-01	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. 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. The water monitoring strategy used enables the identification of all water consumption for sanitary uses as assessed under Wat 01 (l/p/d), if a post occupancy stage certification is sought.	BDP MEP		Criterion 1 is mandatory for BREEAM Very Good Evidence required: - Drawings and specification - Statement confirming the building areas responsible for at least 10% of the total water demand. - If pursuing criterion 6, specification or other form of relevant documentation confirming compliance
Wat 03: Water Leak Detection and Prevention									
Leak Detection System	Wat 03-01	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 MEP		Evidence required: - Drawings and specification
Flow Control Devices	Wat 03-02	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 MEP		Evidence required: - Drawings and specification

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Actual credits 1.07%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wat 04: Water Efficient Equipment									
Water Efficient Equipment	Wat 04-01	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.	BDP MEP		For the purposes of this BREEAM Issue, non-domestic scale, non-sanitary water uses refer to any building integrated water uses not assessed under Wat 01. This includes, but is not limited to the following: – Swimming pools – Recreational hot tubs and hydrotherapy pools – Equipment used for irrigation – Vehicle wash equipment – Project-specific industrial processes – Water filtration and treatment processes – Building services (e.g. cooling towers and humidification systems) If irrigation is provided it is assumed that this will not use potable water. Evidence required: - Statement confirming unregulated water source and confirmation of how water demand will be reduced.
MATERIALS (1 credit = 1.07%)									
Mat 01: Life Cycle Impacts									
Superstructure	Mat 01-01	6	0	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.	Space Architects	2	Potential additional appointment required: LCA consultant to carry out the analysis. This is required for all Mat 01 credits. Mat 01-01 and the subsequent Mat 01 issues require a life cycle analysis and comparison of various materials specifications for different building elements, with a view to selecting materials specifications with the lowest embodied carbon and environmental life cycle impacts.
						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.	Space Architects	4	

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Achieved credits 1.15%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Substructure and Hard Landscaping options appraisal	Mat 01-02	1	0	1		6. Criteria 3 and 4 are achieved.	BDP C&S / Landscape Architect	2	
						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.			
Exemplary Performance Criteria	Mat 01-Ex1	1	0	1		8. Criteria 3-4 are achieved.	BDP MEP	2	
						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.			
Exemplary Performance Criteria	Mat 01-Ex2	1	0	1		10. Achieve criteria 3 to 5.	Design Team	2	
						11. Achieve the Elemental LCC plan and Component Level LCC options appraisal credits (Man 02 Life cycle cost and service life planning).			
						12. Include design options appraised for criteria 3 to 4 (and 6 to 7 and 8 to 9, if pursued) during Concept Design in Assessment scope- The elemental LCC plan.			
						13. Include the design options appraised for criterion 5 during Concept Design in the 'Component Level LCC option appraisal' (in Man 02 Life cycle cost and service life planning)			
	Mat 01-Ex3	1	0	1		14. Integrate the aligned LCA and LCC options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document including the relevant cost information from the 'elemental LCC plan' and 'Component Level LCC option appraisal'.	Design Team		
						15.Criteria 1 to 7 (As applicable to the building type) are achieved.			
						16. A suitably qualified third party carries out the building LCAs or produces a report verifying the building LCAs accurately represent the designs under consideration during Concept Design and Technical Design with reference to the requirements of criteria 1 to 7 (and 8 to 14 if pursued).			
						17. For each LCA option, itemise the findings of the verification checks made by the suitably qualified third party in the report including, as a minimum, the quality requirements shown in Table 9.4 of the guidance manual.			
						18. Include details of the suitable qualified third party's relevant skills and experience and a declaration of their third party independence from the project client and design team in the report.			
Mat 02: Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)									
Specification of Products with a Recognised EPD	Mat 02-01	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).	Space Architects / SRM		This issue requires the selection of a number of materials with the appropriate level of environmental performance declaration (EPD) certification. Evidence required: - Completed Mat 02 template letter (to be provided by the BREEAM Assessor) - Copies of the relevant EPD certificates
						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 Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
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)	SRM		Criterion 1 is mandatory for BREEAM Very Good Mat 03-01 is achieved where a compliant sustainable procurement plan is in place before Concept Design. Credits for issue Mat 03-02 are awarded where the principal contractor demonstrates that key building materials have been responsibly sourced, e.g. from manufacturers with the relevant BES 6001, PEFC, or ISO 14001 certification. Evidence required: - Copy of sustainable procurement plan - Completed Mat 03 calculator tool or template letter to be provided by the assessor (Principal Contractor to provide this evidence) - Copies of relevant certificates (e.g. BES 6001, ISO 14001, PEFC or FSC) (principal contractor to provide this evidence).
	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.	SRM	1	
Measuring Responsible Sourcing	Mat 03-02	3	2	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).	SRM		
Mat 05: Designing for Durability and Resilience									
Designing for Durability and Resilience	Mat 05-01	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.	Space Architects		Key exposed building elements in the context of this issue are those adding up to at least 80% by area of each of the following categories: 1. External walls and cladding 2. Roof or balconies 3. Glazing: windows, skylights 4. Hard landscaping Evidence required: - Drawings highlighting vulnerable areas and measures implemented to protect them from damage. - Drawings, specification, reports or any other evidence to demonstrate compliance with criteria 2.
						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 Very Good (min. 55%) 71.15%	Potential credits 47.85%	Allocated credits 0.60%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Mat 06: Material efficiency									
Material Efficiencies	Mat 06-01	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	Space Architects	1 to 5	15.12.20: BREEAM Assessor has re-sent the full breakdown to the design team for review.
						2. Develop and record the implementation of material efficiency during: a. Developed Design b. Technical Design c. Construction			20.11.20: BREEAM Assessor has provided Space with a template document with a full breakdown of what is required at each stage.
						3. Report the targets and actual material efficiencies achieved.			Examples of suitable material efficiency design measures can include: 1. Increasing the utilisation factor of structural members 2. Designing to standard material dimensions to reduce off-cuts and waste on site 3. Removing redundant materials from the design 4. Using materials that can be recycled or reused at the end of their service life 5. Making use of recycled or reclaimed materials 6. Designing for deconstruction and material reuse 7. Using pre-fabricated elements where appropriate to reduce material waste 8. Consider using an 'exposed thermal mass' design strategy to reduce finishes. 9. Avoiding over-specification of predicted loads 10. Using lightweight structural design strategies 11. Making use of bespoke structural elements where this will reduce overall material use 12. 'Rationalisation' of structural elements 13. Optimising the foundation design for embodied environmental impact. Evidence required: - Dedicated report that sets out a clear framework to guide material efficiency activities throughout the design and construction of the project. - Reports, meeting notes or any other relevant evidence to demonstrate compliance with the criteria and to confirm the BRE's methodology has been followed. - Project programme confirming dates of each RIBA Stage
WASTE (1 credit = 0.60%)									
Wst 01: Construction Waste Management									
Pre-Demolition Audit	Wst 01-01	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.	Demolition Contractor / Design Team	2	20.11.20: BREEAM Assessor has provided SRM with the scope for the pre-demolition audit
						2. Make reference to the audit in the resource management plan (RMP).	SRM		Where demolition takes place, a compliant pre-demolition audit will be undertaken to investigate the potential for the reuse of demolition materials, and to maximise opportunities for diversion of demolition materials from landfill. Evidence required: - Pre-demolition audit - Confirmation that the audit was carried out by a suitably qualified person - Description of how the audit has been used to guide the design (re 1b) - Demolition waste data sheets and comparisons - Resource management plan

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Actual credits 1.15%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Construction Resource Efficiency	Wst 01-02	3	2	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.	SRM		Evidence required: - Resource management plan
						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			
Diversion of Resources from Landfill	Wst 01-03	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	SRM		
						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.			
Exemplary Performance Criteria	Wst 01-Ex	1	0	1		7. Non-hazardous construction waste generated, excluding demolition and excavation waste is less than or equal to the exemplary level resource efficiency benchmarks: Exemplary level: ≤ 1.6m2 actual volume (not bulk) / ≤ 1.9 tonnes	SRM		
						8. The percentage of non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmarks outlined below: Non-demolition: 85% volume / 90% tonnage Demolition: 85% volume / 95% tonnage Excavation: 95% volume / 95% tonnage			
						9. All key waste groups in Table 10.3 of the guidance manual, for diversion from landfill are covered in the RMP.			
						10. Waste data obtained from licenced external waste contractors is reliable and verifiable, by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms or from PAS 402:2013 compliant company.			
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	BDP C&S		
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.	BDP C&S		
						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.	BDP C&S		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wst 03: Operational Waste									
Operational Waste	Wst 03-01	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.	Space Architects		Evidence required: - Marked up drawings and / or specification - Statement confirming the significant waste streams (if any).
						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. 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.	Space Architects / BDP C&S / BDP MEP	2	15.12.20: BREEAM Assessor has re-sent the definitions and example report to the design team for review. 20.11.20: BREEAM Assessor has provided SRM with all of the required definitions and an example report to assist with this credit. Evidence required: - Climate change adaptation strategy appraisal report - Evidence that recommendations/solutions have been implemented where practical and cost effective. - Project programme confirming dates of RIBA Stage 2 and 4
						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.	Space Architects / BDP C&S / BDP MEP	4	
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. 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	Design Team		
Wst 06: Design for Disassembly and Adaptability									
Recommendations	Wst 06-01	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. 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.	Space Architects	2	15.12.20: BREEAM Assessor has re-sent the methodology to the design team for review. 20.11.20: BREEAM Assessor has provided Space with a full methodology for completing the disassembly and adaptability study. Evidence required: - Disassembly and functional adaptability study - Implementation plan report - Stage 4 update (as per criterion 4) - Building adaptability and disassembly guide.
Implementation	Wst 06-02	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, 5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	Space Architects	4	

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
LAND USE AND ECOLOGY (1 credit = 1.00%)									
LE 01: Site Selection									
Previously Occupied Land	LE 01-01	1	1			1. At least 75% of the proposed development is on previously occupied land	Space Architects		Evidence required: - Marked up drawing confirming areas of previously occupied land (in m2) and building footprint (m2).
Contaminated Land	LE 01-02	1	1			2. A contaminated land professional undertakes a site investigation, risk assessment and appraisal, which deems that land within the development footprint to be affected by contamination. This report identifies: a. The degree of contamination b. The contaminant sources/types c. The options for remediating sources of contamination which present an unacceptable risk.	BDP C&S		18.11.2020: It was confirmed in the pre-assessment workshop that the site is contaminated. Evidence required: - A copy of the remediation strategy and implementation plan.
						3. The client or principal contractor confirms that a remediation strategy will be implemented, in line with the report.			
LE 02: Ecological Risks and Opportunities									
Pre-Requisite (Statutory Obligations)	LE 02-Pre	-	-	-	-	1. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	Client / SRM		Potential additional appointment required: Ecologist. This is required for all remaining ecology credits. Evidence required: - Formal statement or other form of appropriate documentation
Survey and Evaluation	LE 02-01	1	1			3. A Suitably Qualified Ecologist (SQE) carries out a survey and evaluation for the site early enough to influence site preparation works, layout and, where necessary, strategic planning decisions (typically Preparation and brief stage).	Ecologist	1	Evidence required: - A copy of the Ecological Survey and Evaluation document - Evidence demonstrating that the recommendations and data has been shared with the team, in line with criterion 5 requirements.
						4. The SQE's survey and evaluation determines the site's ecological baseline, including: 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 from the project. c. Capacity and feasibility for enhancement of the site's ecological value and, where relevant, areas within the Zone of Influence.	Ecologist / Design Team		
						5. Recommendations and data collected from the survey and evaluation are shared with appropriate project team members to influence decisions made for activities during site preparation, design and construction works, which can support ecological features.			
Determining Ecological Outcomes	LE 02-02	1	1			6. Achieve the LE 02-01 "Survey and Evaluation" credit. 7. The project team liaise and collaborate with representative stakeholders early enough to influence key planning decisions (typically Concept Design stage), to: a. Identify the optimal ecological outcomes for the site. b. Identify, appraise and select measures to meet the optimal ecological outcomes for the site (criterion 7a), in line with the mitigation hierarchy of action: 1. Avoidance 2. Protection 3. Reduction or limitation of negative impacts 4. On site compensation and 5. Enhancement, considering the capacity and feasibility within the site, or where viable, offsite.	Ecologist / Design Team	2	Evidence required: - Meeting minutes, drawings, or any other suitable evidence. - SQE to confirm that measures are sufficient for meeting the ecological outcomes agreed and that they are feasible giving the nature of the site.
Exemplary Level Criteria	LE 02-Ex	1	0	1		To achieve one exemplary performance credit: Wider site sustainability 8. Achieve criteria 7 / LE02-02 above.	Ecologist / Design Team		Compliance with this issue will be investigated.
						9. Wider sustainability related activities and potential ecosystem service benefits are considered as part of determining the optimal ecological outcomes for the site (criterion 7), including the areas outlined in the Methodology below.			
						10 Achieve the credits of the assessment issues outlined below: a. Hea 07 Safe and healthy surroundings - Both credits b. Pol 03 Flood and surface water management - Achieve credits for 'Surface water run-off' and 'Minimising watercourse pollution' c. Pol 05 Reduction of noise pollution			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
LE 03: Managing Impacts on Ecology									
Pre- Requisite	LE 03-Pre	-	-	-	-	1. LE 02's 'Survey and evaluation and Determining ecological outcomes' criteria have been achieved.	Design Team		Evidence required: - Meeting minutes from ecology workshop - Evidence from contractor outlining how on-site measures for managing negative ecological impacts will be implemented (re criterion 3). - Evidence to confirm that the project team and representative stakeholders have been involved in these discussions
Planning and Measures On-Site	LE 03-01	1	1			2. Further planning to avoid and manage negative ecological impacts on-site is carried out (see Methodology in guidance manual) early enough to influence the concept design and design brief as well as site preparation planning (typically Concept Design stage).	Design Team	1 or 2	
						3. On-site measures for managing negative ecological impacts during site preparation and construction are implemented in-practice (e.g. mitigation measures to protect existing ecological features) (see Methodology in guidance manual).	SRM		
						4 Criteria 2-3 are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 Ecological risks and opportunities (see Methodology).	Design Team		
Managing Negative Impacts of the Project	LE 03-02	2	2			7. Criteria 2-4 have been achieved. 8. Negative impacts from site preparation and construction works have been managed according to the mitigation hierarchy, in line with the SQE's recommendations and, either: a No overall loss of ecological value has occurred (two credits). OR where criterion 8.a is not possible: b. The loss of ecological value has been minimised (Minimising Loss) (one credit)	Ecologist / SRM / Design Team		Evidence required: - Contractor statement confirming compliance with criterion 8 - Confirmation that there has been no loss in ecological value or that loss has been minimised as a result of the development
LE 04: Ecological Change and Enhancement									
Pre- Requisite	LE 04-Pre	-	-	-	-	1. Criterion 8 in LE 03 has been achieved.	Design Team		Evidence required: - Formal statement or other form of appropriate documentation
						2. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.	SRM / Client		
Change and Enhancement of Ecology	LE 04-01	3	3			4. Up to three credits are awarded based on 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 in line with the Reward Scale table in GN36 where there are no residual impacts on protected sites or irreplaceable habitats.	Ecologist / Landscape Architect		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) Evidence required: - Completed version of BREEAM Change in Ecological Value Calculator and supporting evidence
Ecological Enhancement	LE 04-02	1	1			5 Measures have been implemented that enhance ecological value, which are based on input from the project team and SQE in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02. Measures are implemented in the following order: a. On site, and where this is not feasible, b. Off site within the Zone of Influence.	Ecologist / Space Architects		Evidence required: - Statement or other form of evidence confirming which measures have been implemented.
						6. Data collated are analysed and where potentially valuable, provided to the local environmental records centres nearest to, or relevant for, the site.			
Exemplary Level Criteria	LE 04-EX	1	0	1		7. The change in ecological value calculated under criterion 6 above confirms significant net gain has been achieved as 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)	Ecologist / Space Architects		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%)	Potential credits	Achieved credits	Compliance Requirements	Responsibility	RIBA Stage	Comments
LE 05: Long Term Ecological 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.			Evidence required: - Statement or other form of relevant documentation
						2. Criterion 8 in LE 03 has been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.			
Planning, Liaison, Data, Monitoring and Review Management and Maintenance	LE 05-01	1	1			3. Measures have been implemented to manage and maintain ecology throughout the project. These measures are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02. To ensure the optimal ecological outcomes agreed in LE 02 are met in-practice, these measures must monitor and review the effectiveness of the mitigation and enhancement measures in place for LE 03 & LE 04 to ensure they are implemented.	SRM / Design Team		Evidence required: - Statement or other relevant evidence confirming compliance with criterion 3, including information on how effectiveness will be monitored and reviewed. - Copy of the landscape and habitat management plan, or written confirmation that one will be produced - Statement confirming that the building owner information which includes an Ecology and Biodiversity section.
						4. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information supplied, to inform the owner or occupant of local ecological features, value and biodiversity on or near the site. This should include detailed management and maintenance plans as required by landscape and asset managers as well as relevant parts of the handover information for occupiers written in a format that encourages understanding and supportive behaviours.	Ecologist / SRM / Design Team		
Landscape and Ecology Management Plan (or similar) development	LE 05-02	1	1			5. A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS 42020:2013 Section 11.1(213) covering at least the first five years after project completion as a minimum and including: a. Actions and responsibilities of relevant individuals prior to handover b. The ecological value and condition of the site at handover and how this is expected to develop and change over time c. Identification of opportunities for ongoing alignment with activities beyond the development project, which support 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 for delivering the plan	Landscape Architect / Ecologist		Evidence required: - Landscape and ecology management plan or written statement/ confirmation that one will be produced. - Statement confirming compliance with criterion 6
					6. The landscape and management plan or similar will be updated to support maintenance of the ecological value of the site (see sections relating to Maintenance and Monitoring in CIEEM, CIRIA, IEMA, for helpful guidance).				
POLLUTION (1 credit = 0.67%)									
Pol 01: Impact of Refrigerants									
Impact of Refrigerant	Pol 01-01	2	1	1		Three credits - No refrigerant use 1. Where the building does not require the use of refrigerants within its installed plant/systems.	BDP MEP		At least 1 of the 2 available credits will be targeted. Evidence required: - Specification - Where pursuing criterion 3 or 5 a copy of the Pol 01 calculator tool and supporting evidence
						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 (DELC CO2e) 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. 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 (DELC CO2e) of ≤ 1000 kgCO 2e/kW cooling/heating capacity.				
Leak Detection	Pol 01-02	1	1			6. All systems are hermetically sealed or only use environmentally benign refrigerants. OR	BDP MEP		Evidence required: - Specification
						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).			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Achieved credits 0.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 02: Local Air Quality									
Local Air Quality	Pol 02-01	2	0	2		1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively;	BDP MEP		These credits can be difficult to achieve however they will be investigated.
						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.			
Pol 03: Flood and Surface Water Management									
Flood Resilience	Pol 03-01	2	2			1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Two credits - Low flood risk	BDP C&S		The site is on an area of low flood risk therefore 2 credits can be targeted. Evidence required: - Site specific flood risk assessment - Statement from the 'appropriate consultant' that they meet the BRE's definition of such - Where only 1 credit is achieved, drawings and specification to demonstrate compliance with criterion 4.
						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.			
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.	BDP C&S		Evidence required: - Drainage strategy report - Calculation results for the pre-and post development peak rate of run-off - Statement or other form of evidence confirming relevant maintenance agreements for the ownership, long term operation and maintenance of SUDS will be in place.
	Pol 03-02	1	1			One credit - Surface water run-off - Rate 6. The following must comply: a. For brownfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events. b. For Greenfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1-year and 100-year return period events.	BDP C&S		
						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.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Achieved credits 1.15%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Surface Water Run-off	Pol 03-03	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.	BDP C&S		Evidence required: - Drainage strategy report - Information showing the proposed drainage solution, system failure flood flow routes, potential flood ponding levels and ground floor levels - Calculation results for the pre- and post development volume of run-off - Statement or other form of evidence confirming relevant maintenance agreements for the ownership, long term operation and maintenance of SUDS will be in place.
Minimising Water Course Pollution	Pol 03-04	1	0	1		16. There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant). 17. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate Suds techniques. 18. Areas with a high risk of contamination of spillage of substances, such as petrol and oil have separators (or an equivalent system) are installed in surface water drainage systems. 19. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of spillage or bunding failure. 20. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the Suds manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site. 21. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. 22. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Suds must be in place. 23. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.	BDP C&S		Criterion 16 can be difficult to achieve and as such this is currently not targeted.
Pol 04: Reduction of Night Time Light Pollution									
Reduction of Night Time Light Pollution	Pol 04-01	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 MEP		Evidence required: - Specification

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 71.15%	Potential credits 47.85%	Allocated credits 1.12%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 05: Reduction of noise pollution									
Reduction of Noise Pollution	Pol 05-01	1	1			1. There are no noise-sensitive areas within the assessed building or within 800m radius of the assessed site. OR	BDP Acoustician		Evidence required: - Noise impact assessment - Confirmation from the acoustician that they meet the BRE's definition of a 'suitably qualified acoustician' - Confirmation from the contractor that post completion testing will be carried out or that external plant has been specified in line with the acoustician's recommendations
						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.	SRM		

Appendix 2: Energy Strategy Report

Hyde Road School

Energy Report (BRUKL 2013)

Doc No: HRS-BDP-XX-XX-RP-J-0801
Issue: Stage 2
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Date: January 2021



Revision	Date	Description	By	Approved
P01	22/12/2020	Stage 2	Spyros Akritidis	
P02	04/01/2020	Stage 2	Spyros Akritidis	

Contents

Executive summary 3

Introduction 4

Tools and Methods.....4

Design Inputs.....4

 Weather data.....4

 Geometry 5

 Envelope and constructions.....6

 Fenestration and solar shading 6

 Opaque construction elements.....6

 Air permeability 6

 HVAC 7

 Domestic Hot Water 7

 Lighting.....7

 Other settings.....7

 Low and zero carbon technologies 7

Results 8

 Criterion 1.....8

 Energy Performance Certificate (EPC) 8

 Manchester Core Strategy 2012 to 2027 8

 BREEAM ENE 01, Energy & Carbon.....8

 Criterion 3 – Solar gains 8

Appendix A – Screen capture of BRUKL document 9

Appendix B – Screen capture of EPC 11

Appendix C – BREEAM 12

Executive summary

- 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.
- A 'B' (29) rated EPC can be achieved with 14.4% betterment of Part L 2013.
- Prerequisite BREEAM "Very Good" under ENE01 is achieved (2018 version).
- The current model includes a PV array of 200m² 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 Part L betterment and EPC rating.
- Other key features include:
 - Low Specific Fan Power (SFP)
 - Lighting occupancy sensing controls shall be used in all locations
- It should be noted that the Part L model assumes a lighting efficacy of 100 luminaire lumens per circuit watt.

Introduction

BDP has been commissioned to perform a Building Regulations Part L2A (2013) assessment of the Hyde Road School (the 'Project') for Sir Robert Mcalpine (the 'Client'). The Project is located at an urban location in Belle Vue (Manchester area) on Hyde Road, opposite the Belle Vue Sports Village.

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 not 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.

Weather File	Dry-bulb Temperature (°C)		
	Minimum	Maximum	Mean
ManchesterTRY05.fwt	-4	27.2	9.78

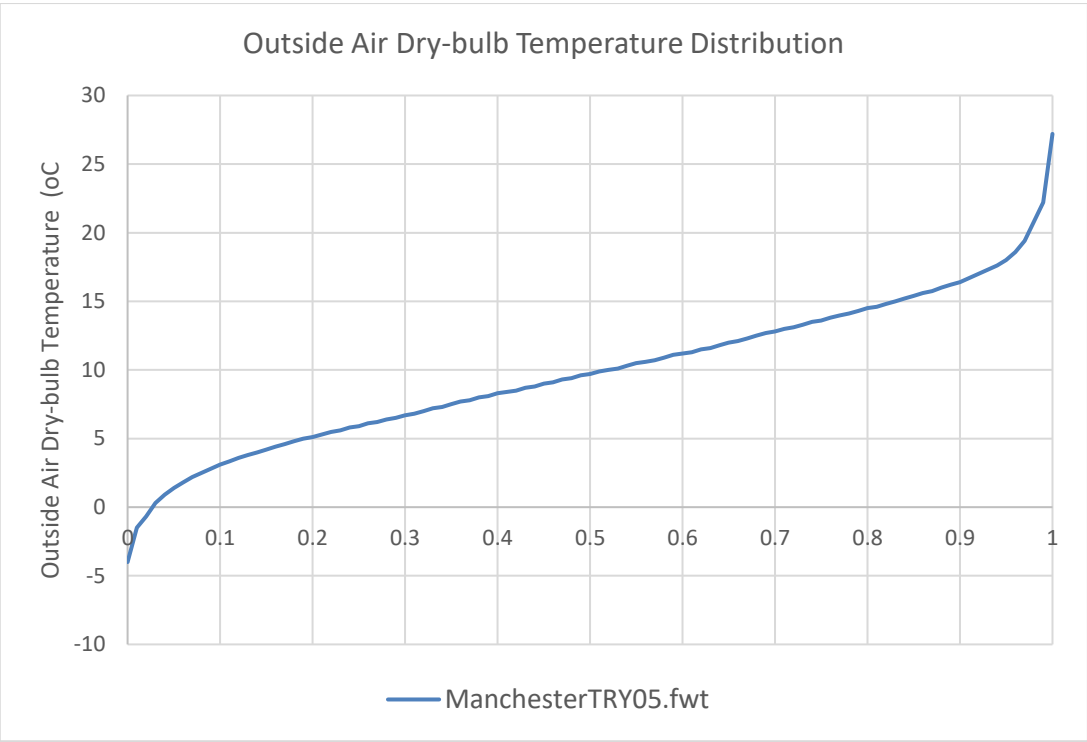


Figure 1 Distribution of external temperature occurrences throughout the year

Geometry

- The geometry was based on the P02 Architectural information by SPACE Architects, using the current drawings as they were provided on 14th December 2019.
- The development comprises of one central facility.
- The facility consists of 3 levels and facilitates:
 - classrooms, a sports hall, an auditorium, kitchen, dining room offices and a plant room on the ground floor
 - classrooms, a library, offices and a plant room on the first floor
 - classrooms, laboratories, computer rooms and offices on the second 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 not been modelled

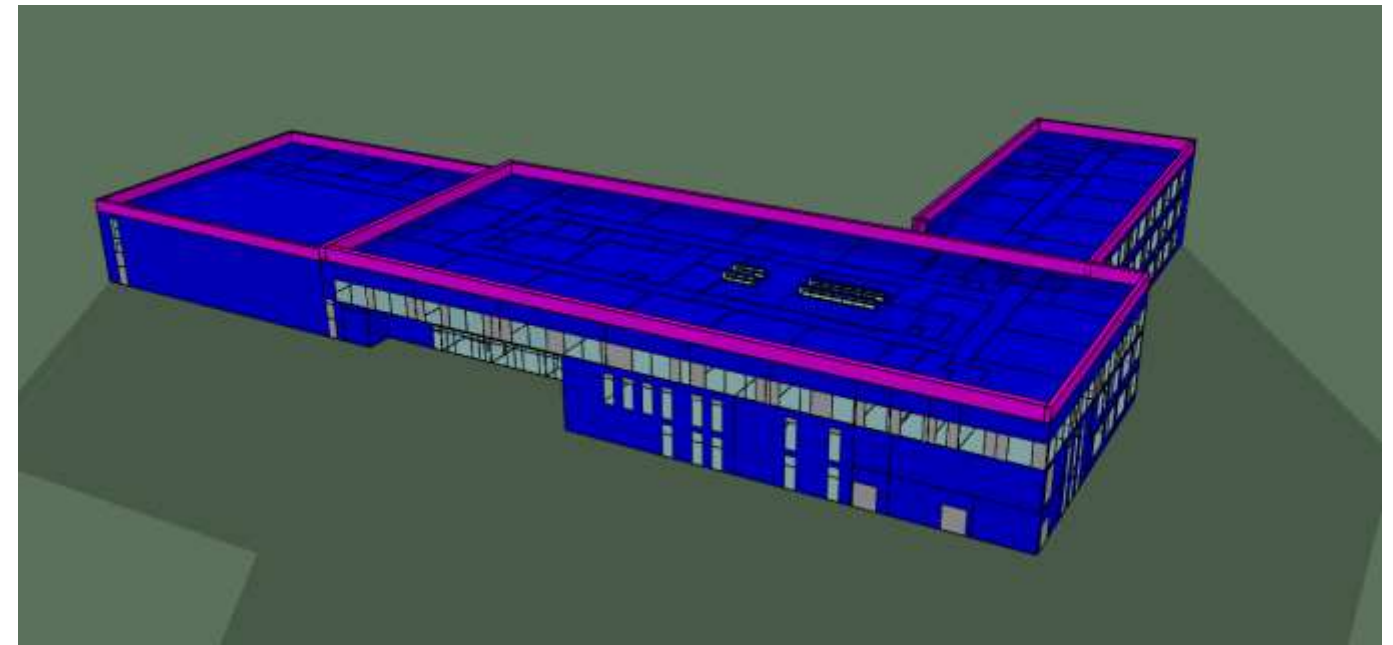


Figure 3 View from North of analysis model

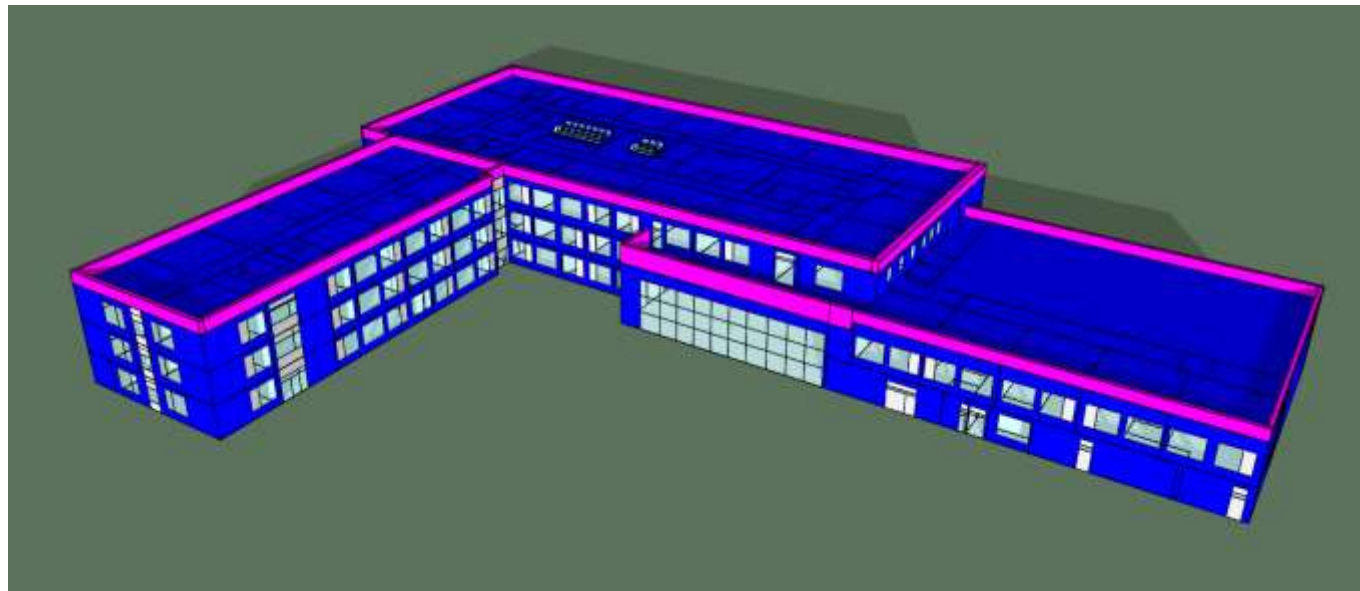


Figure 2 View from South of analysis model

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	Windows	1.4	0.32	0.7	10%	NO
B	Roof lights	1.6	0.32	0.7	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 system	0.22
Insulated Louvres	Insulated panels	1.1
Roof	Insulated Concrete Deck	0.17
Ground Floor	Insulated reinforced concrete	0.16
Internal floor/ceilings	Generic internal floor/ceiling construction with chipboard and plasterboard finishes	1.08
Internal partitions – light	Generic lightweight insulated partitions	1.78

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 classrooms are served by heating coils within hybrid units
- The main hall, activity studio, drama studio and the kitchen are served by heater batteries
- Community areas is served by heating coils within the MVHR Units
- Server rooms are cooled by DX split systems
- The sports hall, circulation areas, dining areas, toilets and plant rooms are served by LTHW radiators

Heating coils within hybrid units	
NCM Type	Central heating using water (convectors)
Heating Generation	Gas boiler
Generator seasonal efficiency	95% (boiler)
Cooling/Ventilation Mechanism	Hybrid natural ventilation
System Specific Fan Power (SFP) W/(l/s)	(see table below)

Heater batteries	
NCM Type	Single duct VAV
Heating Generation	Gas boiler
Generator seasonal efficiency	95% (boiler)
Nominal EER (kW/kW)	3.32
Seasonal EER (kW/kW)	5.2
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	As per AHU01 - AHU05

DX	
NCM Type	Split or multi-split system
Heating Generation	Heat pump (air source)
Seasonal COP (kW/kW)	3.2
Seasonal EER (kW/kW)	3.4
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)	As per AHU04 (see table below)

LTHW Radiators / Mechanical Ventilation	
NCM Type	Central heating using water (radiators)
Heating Generation	Gas boiler
Generator seasonal efficiency	95% (boiler)
Vent Heat Recovery Eff.	Plate heat exchanger, (for efficiency see table below)
System Specific Fan Power (SFP) W/(l/s)	As per AHU01 - AHU05 (see table below)

Ventilation System	SFP (W/(l/s))	Vent Heat Recovery Efficiency (%)
AHU 01-05	1.64	75
Kitchen Extract	2	0
Hybrid Units	0.25 (exhaust)	0
Toilet Extract	0.5 (exhaust)	75
Specialist Extract	1 (exhaust)	0

Domestic Hot Water

- Domestic Hot Water is provided by high efficiency gas fired boilers with the following assumed characteristics:
 - Loop length 400 m
 - Circulation losses 6 W/m
 - Pump power 0.5 kW

Lighting

- Lighting is set to achieve lighting efficacy of 100 luminaire lumens per circuit watt
- Occupancy sensing is assumed to automatically turn lights off in all occupied spaces except for the ground floor sports hall
- No photoelectric dimming is assumed

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

Low and zero carbon technologies

To enable the proposal to achieve the targeted ENE01 BREEAM credits, the scheme integrates a photovoltaic panel (PV) array. A solar PV array of 200m² has been assumed to be able to fit onto the roof, with the following characteristics:

- Size: 200 m²
- Orientation (° clockwise from North): 180°
- Inclination (° from horizontal): 35°
- 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 /m ² /annum)		Improvement (%)
	BER	TER	
This project	12.781	14.936	14.4%

- The building achieves an improvement of 14.4% over Part L 2013

Energy Performance Certificate (EPC)

- The design yields an Asset rating of 29 (28.79) , a ‘B’ 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 14.4% improvement over part L 2013 is equivalent to an improvement of 23.4% 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: 0.224
- Credits: 2
- Prerequisite for ‘Very Good’ (2 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 two 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
(PER15) Drama Studio	22.6%
(DIN01) Dining Room	92.6%

Appendix A – Screen capture of BRUKL document

BRUKL Output Document

Compliance with England Building Regulations Part L 2013

HM Government

Project name

Hyde Road School

As designed

Date: Tue Dec 22 09:52:18 2020

Administrative information

Building Details

Address: Hyde Road School, 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: Chris Yates
Telephone number: +441618282453
Address: BDP, PO Box 85, 11 Ducie Street, Manchester, M60 3JA

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	14.9
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	14.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	12.8
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	0.22	0.22	01000035:Surf[1]
Floor	0.25	0.16	0.16	01000019:Surf[0]
Roof	0.25	0.17	0.17	01000036:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.4	1.6	RF000000:Surf[10]
Personnel doors	2.2	1.19	2.2	01000036:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

U_{a-Limit} = Limiting area-weighted average U-values [W/(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- MVHR HR 75%

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.95	-	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- NVHR

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.95	-	0.2	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					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- Hybrid NVHR

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.95	-	0.2	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					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.					

4- DX Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.2	3.4	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- Heater Batteries HR 75%

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.95	3.32	0	1.64	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.					

6- Heater Batteries No HR - Kitchen

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.95	3.3	0	1.64	-
Standard value	0.91*	2.55	N/A	1.6^	N/A
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.					

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m²]	8864.1	8864.1		A1/A2 Retail/Financial and Professional services
External area [m²]	11671.9	11671.9		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]	3782.39	4497.31		B8 Storage or Distribution
Average U-value [W/m²K]	0.32	0.39		C1 Hotels
Alpha value* [%]	9.92	10		C2 Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				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
			100	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	20.26	20.2
Cooling	0.3	0.29
Auxiliary	5.99	3.6
Lighting	9.14	13.04
Hot water	11.27	9.16
Equipment*	20.19	20.19
TOTAL **	46.96	46.29

* 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	3.59	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]	68.17	67.19
Primary energy* [kWh/m²]	85.11	86.93
Total emissions [kg/m²]	12.8	14.9

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

Appendix B – Screen capture of EPC

Energy Performance Certificate

Non-Domestic Building

Hyde Road School

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+

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Net zero CO₂ emissions

29

This is how energy efficient the building is.

Less energy efficient

Technical information

Main heating fuel:

Natural Gas

Building environment:

Heating and Natural Ventilation

Total useful floor area (m²):

8864.098

Building complexity (NOS level):

5

Building emission rate (kgCO₂/m² per year):

12.78

Primary energy use (kWh/m² per year):

85.11

Benchmarks

Buildings similar to this one could have ratings as follows:

34

If newly built

90

If typical of the existing stock

Appendix C – BREEAM

Energy performance - Building score

Methodology used	Standard	
Total BREEAM credits achieved	2.0	
Heating and cooling demand energy performance ratio (EPRdem)	0.041	
Primary consumption energy performance ratio (EPRpc)	0.076	
CO ₂ -eq energy performance ratio (EPRco2-eq)	0.107	
Overall building energy performance ratio (EPRnc)	0.224	
% improvement BER/TER	14.4	%

Calculate score

Clear

Passive design note

Date: 22 December 2020
Project Name: Hyde Road School
Job No/File Ref: P3001502
Author: Spyros Akritidis (Building Physicist MEng, MSc)

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 Hyde Road School development, as part of the redevelopment of the current build zone and the car park, located at the Bell Vue Street and Hyde Road junction.



Figure 1 Hyde Road School location

The scheme proposes the building of a new, economically and environmentally, efficient school (approx. 9,000 m² over 3 floor levels).

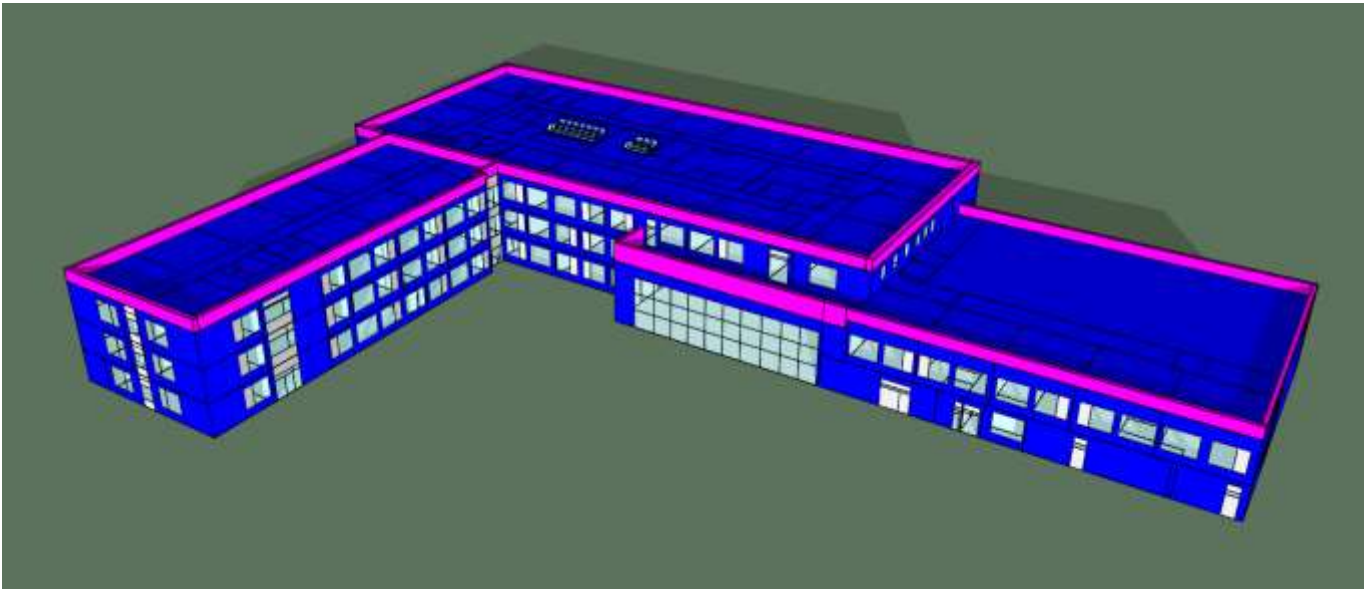


Figure 2 View from South of analysis model

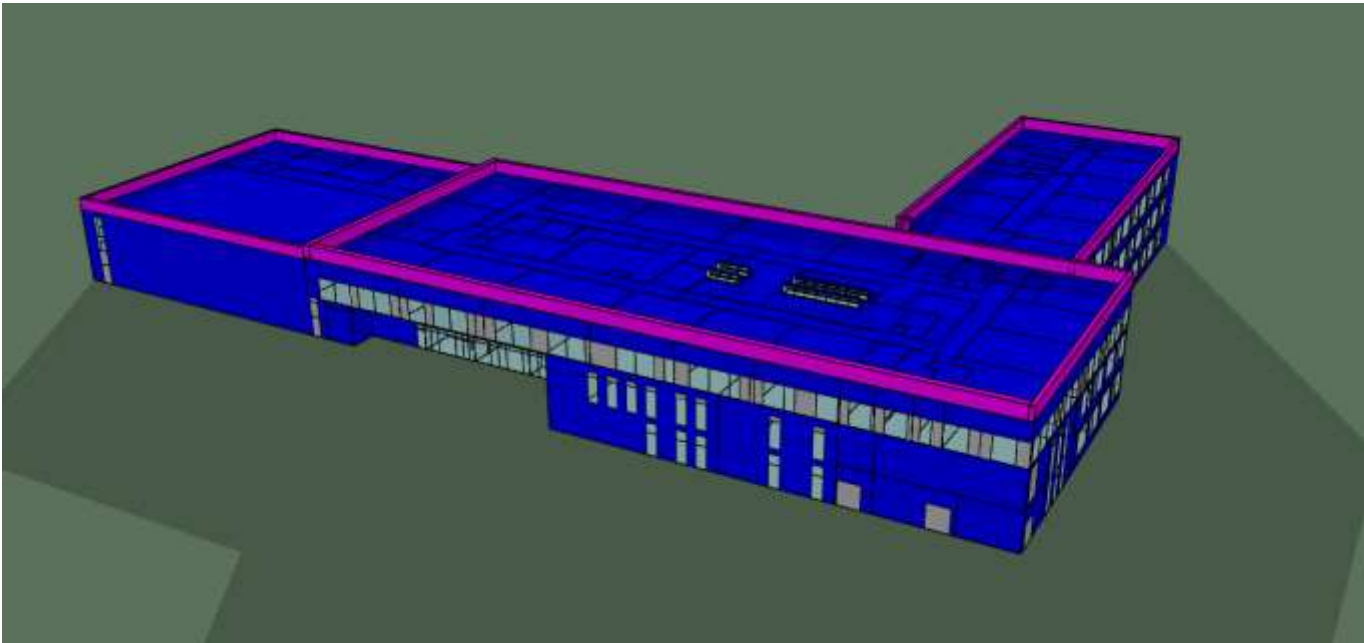


Figure 3 View from North of analysis model

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 Belle Vue (Manchester area) on Hyde Road, opposite the Belle Vue Sports Village. 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 development comprises of one central facility, consisting of 3 levels and facilitates:

- classrooms, a sports hall, an auditorium, a kitchen, a dining room, offices and a plant room on the ground floor
- classrooms, a library, offices and a plant room on the first floor
- classrooms, laboratories, computer rooms and offices on the second floor
- toilets, stores and circulation areas in all floors

The classrooms are located at the building perimeter, which allows 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 2.25m and the average depth of a typical classroom is about 7.8m, meaning that there should be enough provision of daylight at the area where pupils are expected to be seated.

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 significant, due to the fact that the external glazing consists about 30% 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 consists of two rectangular-shaped buildings (northern 105m by 35m and southern one 19m by 42m approximately) with the longest sides facing north and south (apart from the southern building facing along the east-west axis). 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 three 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 concrete wall system and louvres, with the rest of the building envelope covered with 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. Exposed construction elements could be used (e.g. concrete) that would contribute to high thermal mass effectiveness.

9. Building Occupancy Type:

The building will mainly accommodate classrooms, offices laboratories and assembly halls (e.g. activity studio, library, sports hall) and consequently the building is expected to be occupied during the standard school term periods and during morning to afternoon hours.

10. Daylighting Strategy:

The use of natural daylight is a key part of the passive design of the building. The building incorporates glazed area, mostly on the east, south and west 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 natural and mechanical ventilation spaces as a proposed ventilation strategy.

12. Adaptation to Climate Change:

The proposed building has a footprint of about 4,400m² with the largest flat roof (of about 3,500m²) facing south with only a small area (about 20m²) covered roof lights. The expected absence of near high-rise buildings is expected to have a positive effect on the sunlight availability. The design has been developed to allow full roof access and provide 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

Scenario Options Glazing g-value (-)	U-value (glazing + framing) (W/m ² K)	Light transmission (-)	Frame factor	Blinds
0.28	1.4 & 1.6 (roof lights)	0.7	10%	NO
0.32				
0.34				
0.36				

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: Glazing g-value of 0.28
- Scenario 2: Glazing g-value of 0.32
- Scenario 3: Glazing g-value of 0.34
- Scenario 4: Glazing g-value of 0.36

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)					
		Glazing g value 0.28	Glazing g value 0.32	Glazing g value 0.34	Glazing g value 0.36
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	189.9	199.5	194.4	191.9	189.4
Cooling	2.7	2.2	2.4	2.5	2.6
Auxiliary	31.9	52.6	53.1	53.3	53.5
Lighting	115.6	81.0	81.0	81.0	81.0
Total	340.1	335.3	330.8	328.7	326.5
Energy savings		1.4%	2.7%	3.4%	4.0%

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

CO ₂ emissions (tons)					
		Glazing g value 0.28	Glazing g value 0.32	Glazing g value 0.34	Glazing g value 0.36
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	41.0	43.1	42.0	41.5	40.9
Cooling	1.4	1.1	1.2	1.3	1.3
Auxiliary	16.6	27.3	27.5	27.7	27.8
Lighting	60.0	42.0	42.0	42.0	42.0
Total	119.0	113.6	112.8	112.4	112.1
CO ₂ savings		4.6%	5.2%	5.5%	5.8%

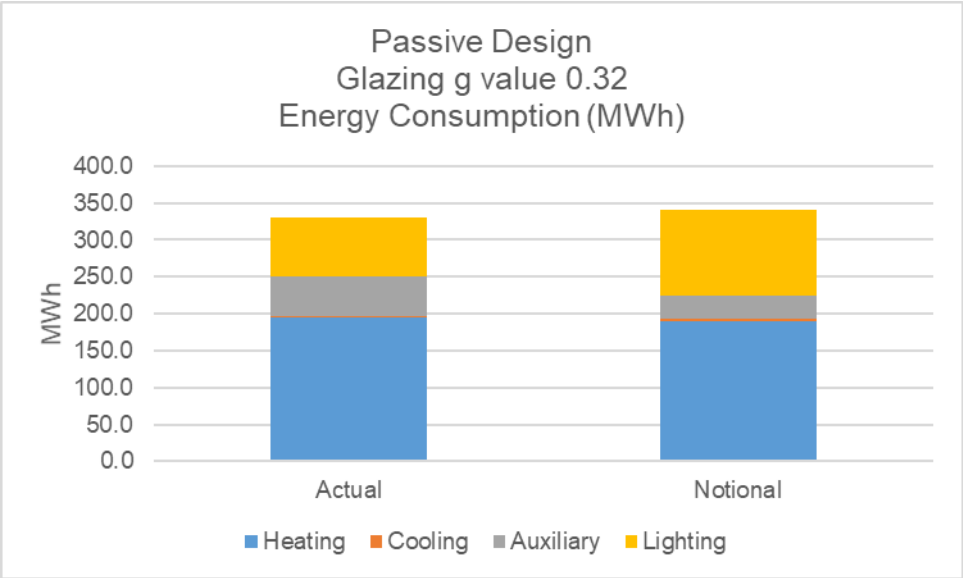


Figure 4 Comparison between actual and notional building for Scenario 2 (glazing g-value of 0.32) – Energy consumption

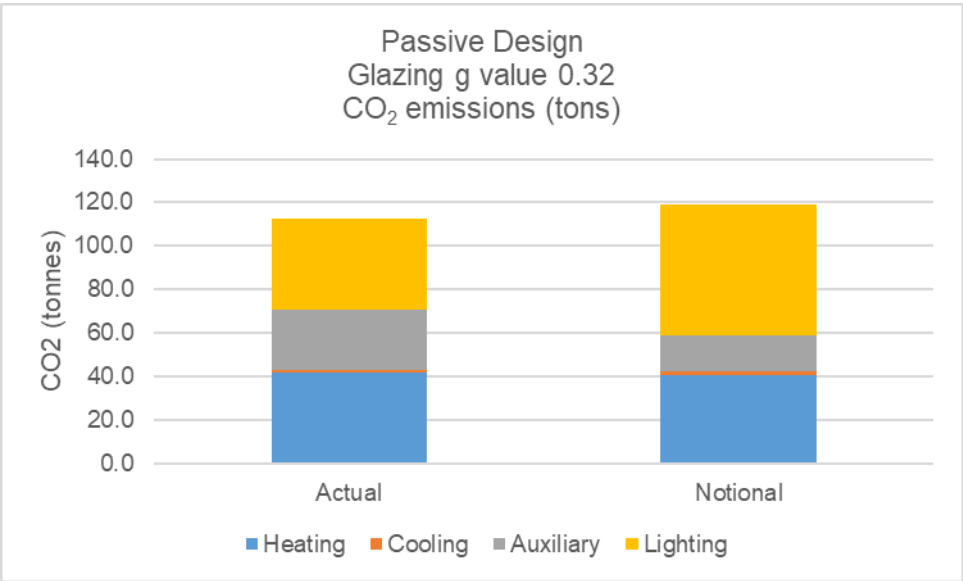


Figure 5 Comparison between actual and notional building for Scenario 2 (glazing g-value of 0.32) – CO₂ emissions

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

Energy Consumption (kWh/m ² *yr)					
		Glazing g value 0.28	Glazing g value 0.32	Glazing g value 0.34	Glazing g value 0.36
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	21.43	22.51	21.93	21.65	21.37
Cooling	0.30	0.24	0.27	0.28	0.29
Auxiliary	3.60	5.94	5.99	6.01	6.04
Lighting	13.04	9.14	9.14	9.14	9.14
Total	38.37	37.83	37.32	37.08	36.84

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

CO ₂ emissions (kgCO ₂ /m ² *yr)					
		Glazing g value 0.28	Glazing g value 0.32	Glazing g value 0.34	Glazing g value 0.36
	Notional Building	Actual Building	Actual Building	Actual Building	Actual Building
Heating	4.63	4.86	4.74	4.68	4.62
Cooling	0.16	0.13	0.14	0.14	0.15
Auxiliary	1.87	3.08	3.11	3.12	3.13
Lighting	6.77	4.74	4.74	4.74	4.74
Total	13.42	12.81	12.72	12.68	12.64