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QVS1 Reading
Energy and BREEAM Statement
WA0305-TBA-Q1-XX-RP-N-00002

5th August 2022

JOB
QVS1 Reading

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Executive Summary

The energy strategy for the '1-15 Queen Victoria Street & 147-148 Friar Street' development has been developed to comply with Building Regulations Part L 2013 and the policies of Reading Borough Council (RBC).

The RBC sustainable Design and Construction SPD 2019 requires new developments above 1000m² to achieve BREEAM Excellent. The development comprises the refurbishment of the listed building at 1-15 Queen Victoria Street and parts of 145 Friar Street with new extensions filling in demolished spaces. **Noting that the listed elements and its extensions are excluded from BREEAM assessment.**

The remainder of the development will be assessed as BREEAM 2014 Bespoke Refurbishment and Fit-out, based on the client brief and majority of floor area being Refurbishment and Fit-out. Note that the basis of this assessment is using the RFO 2014 V2 scheme. In order to represent the building more accurately, and ensure a single assessment, a bespoke approach is recommended. Note there will be small changes in criteria determined by the outcome of the BRE's bespoke registration assessment.

This report assesses the Part L and BREEAM Ene01 energy performance of the development and reports the results of the BREEAM 2014 Bespoke Refurbishment pre-assessment.

Low and zero carbon (LZC) measures were assessed and are reported in detail in a separate report [TBA-Q1-XX-RP-N-00003]. The recommendations of the report were integrated into the energy strategy.

The proposed energy strategy includes:

- + High performing fabric for new build and refurbished elements
- + High performance VRF heat pump heating and cooling
- + Heat pumps for DHW
- + MVHR for ventilation
- + High performance LEDs throughout with presence/absence detection and daylight dimming
- + 130m² PV on the roof

The energy performance results are summarised in the table below for the whole development less the listed elements.

	Steps	Energy Savings		CO ₂ Emissions Savings			
		in %	in MWh/year	Part L		SAP10.2	
				in %	in tons CO ₂ /year	in %	in tons CO ₂ /year
Refurbishment	Passive Design	4%	10.6	2%	2.2	2%	2.2
	Active Design	15%	36.4	11%	14.8	5%	5.9
	LZC	126%	313.0	27%	37.9	65%	73.0
New build	Passive Design	4%	10.2	4%	2.2	4%	2.2
	Active Design	8%	19.2	11%	6.4	7%	3.5
	LZC	66%	163.5	45%	26.3	72%	36.6

1.0 Introduction

The development involves the refurbishment and extensions of the listed building at 1-15 Queen Victoria Street and refurbishment and extension and new build of 145-148 Friar Street, Reading. The development will comprise retail units on the Ground Floor and apart-hotel rooms on the upper floors.

2.0 Planning Policies

Building Regulations (England) Part L 2013

With the exception of the listed part of the building, the proposed development will be assessed under Part L 2013.

Reading Borough Local Plan (2019)

CC2: Sustainable Design Construction

Proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials, and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

To meet these requirements:

- + All major non-residential developments or conversions to residential are required to meet the most up to date BREEAM 'Excellent' standards, where possible.
- + All minor non-residential developments or conversions to residential are required to meet the most up to date BREEAM 'Very Good' standard as a minimum.

CC3: Adaption and Climate Change

All developments will demonstrate how they have been designed to incorporate measures to adapt to climate change. The following measures shall be incorporated into development:

- + Wherever possible, new buildings shall be orientated to maximise the opportunities for both natural heating and ventilation and reducing exposure to wind and other elements.
- + Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise resistance and resilience to climate change for example by including measures such as solar shading, thermal mass, heating, and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, green walls, etc

CC4: Decentralised Energy

In meeting the sustainability requirements of this plan, developments of the sizes set out below shall demonstrate how consideration has been given to securing energy for the development from a decentralised energy source. Any development of more than 20 dwellings and/ or non-residential development of over 1,000sqm shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision.

Sustainable Design and Construction Supplementary Planning Document (2019)

The Sustainable Design and Construction SPD outlines the requirements for Non-residential development (including development for non-C3 residential) and Non-residential refurbishment (including refurbishment for non-C3 residential) as follows:

- 1) Minor (less than 1,000 sq. m of floorspace) **BREEAM 'Very Good'**
- 2) Major (1,000 sq. m of floorspace or more) **BREEAM 'Excellent'**

The proposed development comprises 4,738m² floorspace, of which 1,519m² will be assessed under BREEAM and will therefore be targeting BREEAM Excellent.

3.0 BREEAM Pre-Assessment

3.1. Introduction

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for buildings. It sets the standard for best practice in sustainable design and has become the industry standard measure used to describe a building's environmental performance. BREEAM is developed, operated, and maintained by BRE Global Ltd and the operation and direction of the method is overseen by an independent Sustainability Board, representing a wide cross-section of construction industry stakeholders. Launched in 1990, to date, BREEAM has been used to certify over 590,000 assessments of buildings across the building life cycle and is being applied in over 89 countries.

The main output from a certified BREEAM assessment is the BREEAM rating, and certificate. The rating enables comparability between projects and provides reassurance to customers and users, in turn underpinning the quality and value of the asset. The BREEAM ratings range from Acceptable (In-Use scheme only) to Pass, Good, Very Good, Excellent to Outstanding and it is reflected in a series of stars on the BREEAM certificate.

3.2. BREEAM Scope and Scheme Definition

Troup Bywaters + Anders held two BREEAM introduction meetings with the design team on 25th May 2022 and 7th June 2022. A BREEAM Pre-Assessment tracker was developed and shared with the team to collate and record feasibility and aspiration of the different BREEAM requirements. Within these meetings, the team were questioned for their approval of BREEAM credits related to their discipline, and feedback given to viability and presence within the current design.

QVS1 and QVS1+ consists of new and existing building elements. The QVS1 floorplate is connected to the QVS1+ extension, providing a single seamless transition. The extension is a mix of new build floor, extensions to existing floors, and retained floorplates.



Figure 1: Ground floor



Figure 2: Typical floor

The colour coding in Fig. 1 and Fig. 2 show the QVS1+ extension in blue and the QVS1 areas in grey and green. **Noting that only the QVS1+ areas are in scope for this assessment.**

We have calculated the retained vs new areas within QVS1+ in the following table: 71% of the area within scope is retained structure.

	QVS1	QVS1+
Retained (m2)	NA	632
Extended (m2)	NA	151
New (m2)		736
Total Retained	632	
Total New	887	
Retained Area percentage	71%	

The project must conform to the BRE's scoping within the manual Version 2, Section 2 "Part new-build, part refurbishment projects". Although projects over 1,000m² can be undertaken as a single new construction assessment, the interconnected existing and new fabric and services elements within the building would not best represent the project constraints, and lead to a misalignment of new building criteria vs site reality.

The BRE therefore allow the following options to justify the Refurbishment and Fit-out (RFO) approach:

- + If the original building area is greater than 1,000m² and less than 2,500m², and the new area is less than 20% of the original building area
- + If the original building is greater than 2,500m² and the new built elements are no greater than 500m²

Floor area measurements and calculation undertaken by the team, with inputs

from the architects has confirmed neither can be met to justify RFO. The BRE then allows for two more options:

- + **Option 1:** Separate BREEAM New Construction and BREEAM Refurbishment and Fit-out assessments: the refurbishment/new construction boundaries are not clear cut enough to suit this approach. It would also require certain areas to meet different standards

+ **Option 2:** Bespoke BREEAM Assessment in which the whole site is using the RFO and NC manuals in a bespoke set of rules. The bespoke process allows projects that are not considered to be “standard” to be assessed and certified against BREEAM. In the bespoke process, BREEAM criteria are selected and amended for that specific project. Amendments and additions to the standard criteria reflect the unique use and sustainability opportunities of the building and the location, whilst also maintaining high sustainability standards and the BREEAM brand. The final outputs from the bespoke process are a bespoke project criteria appendix and a bespoke project scoring spreadsheet completed by BRE Bespoke Team

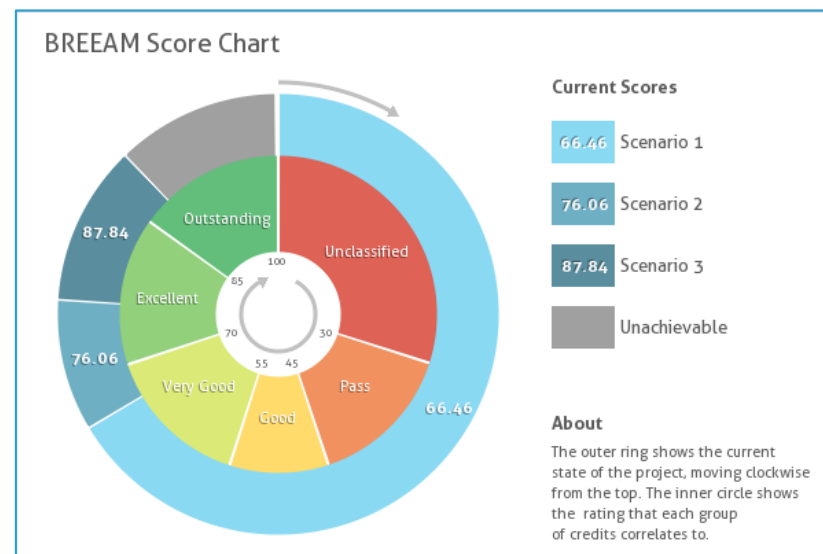
We believe Option 2 would best suit the site due to its inclusiveness, and acknowledgement of retained elements while allowing for a single assessment.

We find it likely that the bespoke approach will consist mainly of RFO criteria. As such, the most accurate assessment at this time is an RFO 2014 pre-assessment. It should be noted some changes will occur as Bespoke is undertaken which will need to be captured as design stage assessment starts. Some expected changes to the bespoke criteria are:

- + Ene 01 – The calculation and weightings are bespoke from project to project, however, it’s expected there will either be an area weighted approach between the new construction model and refurbishment proforma, or a single model under RFO methodology using CN6.
- + Mat 01 – Either a refurbishment and new construction blended approach, or a single LCA. (LCA would be expected to be the easiest approach).
- + Wst 01 – Area weighted targets between the new construction and refurbishment benchmarks.

A BREEAM 2014 Bespoke RFO pre-assessment was carried out for the proposed development to demonstrate how the BREEAM Excellent target can be achieved. The table below shows a summary of the credits achievable under different scenarios.

- + Scenario 1 is targeting Very Good and is expected to be achievable
- + Scenario 2 includes a few extra potential credits that can be easily gained via appointment or increase in scope **to achieve Excellent. This is the optimum scenario.**
- + Scenario 3 credits achieve Excellent with a margin, although the credits are not easily gained.



	Total Credits Available	Weighting	Scenario 1	Scenario 2	Scenario 3
Management	21	14.64%	17	18	21
Health & Wellbeing	20	16.63%	12	13	14
Energy	26	18.26%	15	19	20
Transport	9	7.32%	7	9	9
Water	9	7.32%	6	6	6
Materials	13	15.25%	8	8	11
Waste	11	8.39%	7	9	10

Pollution	13	12.20%	5	8	10
Exemplary /Innovation	10	10%	2	2	4
Total	132		79	92	105
Score			64.35	74.65%	86.44%

Table 1: Summary of credits and weighting for each BREEAM Issue.

Note: We suggest that scenario 2 is undertaken to achieve the required BREEAM rating. It should be noted that exclusion of the extension area within QVS1 will alter the energy model results by reducing the floorspace, and new fabric elements.

We have therefore reduced the potential Ene 01 credits to reduce risk at this stage. It is recommended that Ene 01 is immediately revisited at design stage, and if any credits are removed from the initial 10 credits achieved, to select appropriate Scenario 3 credits to ensure the 5% safety margin can be met.

A BREEAM feasibility report which provides further detail of the feasibility of credits is provided in Appendix B.

4.0 Energy Strategy

This section describes the predicted energy performance and carbon dioxide emissions of the proposed development based on the information provided by the design team.

The methodology set out by the Department of Energy and Climate Change (DECC) for assessing the energy use of is the Simplified Building Energy Model (SBEM). The current version of SBEM utilises out of date Part L2013 SAP2012 carbon factors. The scheme has also been assessed against SAP10.2 Carbon factors in order to present more meaningful figures.

The existing listed building does not need to comply with Part L. The combined floor area of the extensions is 21% of the existing floor area and therefore is not assessed as a new build. Therefore, the existing non-listed part of the development and extensions will be assessed under Part L2B and new build elements under Part L2A.

Methodology

Dynamic thermal modelling software IES 2022 was used to determine regulated energy consumption and CO₂ emissions under Part L 2013 in accordance with the following energy hierarchy:

- + Step 1: Passive Design Measures
- + Step 2: Active Design Measures
- + Step 3: Decentralised Energy
- + Step 3: Low and Zero Carbon Energy

Passive Design Measures

Enhanced 'U' Values

Table 2 shows the proposed U-values for the proposed development:

	Building Element	U-value in W/m ² K
External wall	New Build	0.15
	Existing	2.1
Ground Floor	New Build	0.1
	Existing	1.2
Roof	New Build	0.1
	Existing	0.18
Windows	New Build	1.3
	Existing	1.8

Table 2 proposed and retained U-values

Air Tightness

The proposed development will aim to improve upon the Part L 2013 minimum standards for air tightness by targeting an air permeability rate of 5m³/m² at 50Pa for new build and extension areas, although it may be difficult to undertake air pressure tests on those sections alone, as they are open to the existing building. For refurbished areas an air permeability of 15m³/h/m² is assumed.

Reducing the Need for Artificial Lighting

The design of the development incorporates large areas of glazing across all building elevations, to optimise daylight in occupied spaces. Good internal daylight levels will translate to less dependency on artificial lighting and will indirectly deliver energy and carbon savings, together with pleasant, healthy spaces for occupants.

The energy and carbon savings attributed to passive design measures are summarised in Table 3.

	Energy Savings		CO ₂ Emissions Savings			
	in %	in MWh/year	Part L		SAP10.2	
			in %	in tons CO ₂ /year	in %	in tons CO ₂ /year
Refurbishment/Extensions	4%	10.6	2%	2.2	2%	2.2
New build	4%	10.2	4%	2.2	4%	2.2

Table 3 energy and carbon savings after passive design measures

Active Design Measures

High Efficacy Lighting

The development intends to incorporate low energy lighting fittings throughout the spaces. All light fittings will be specified as low energy lighting with an average lighting efficacy of 100lum/W.

Heat Recovery Ventilation

Mechanical ventilation heat recovery (MVHR) is proposed for both the retail units and the apart-hotel with an average SFP of 0.9W/l/s

Heating, Cooling and DHW

Please see Low and zero carbon energy section.

Controls

Advanced lighting and space conditioning controls will be incorporated, specifically:

- + For areas of infrequent use, occupant sensors will be fitted for lighting, whereas day lit areas will incorporate daylight sensors where appropriate; and,
- + Space conditioning will be controlled by time and temperature zone controls.

Monitoring

Apart from the above design measures, the development will incorporate monitoring equipment and systems to enable building users to monitor and reduce their energy use.

Where feasible, a BMS system that enables monitoring and reporting of the energy use of the building will be installed.

The cumulative energy and carbon after active design measures are summarised in Table 4.

	Energy Savings		CO ₂ Emissions Savings			
	in %	in MWh/year	Part L		SAP10.2	
			in %	in tons CO ₂ /year	in %	in tons CO ₂ /year
Refurbishment/Extensions	15%	36.4	11%	14.8	5%	5.9
New build	8%	19.2	11%	6.4	7%	3.5

Table 4 energy and carbon savings after active design measures

Decentralised heating

As discussed in the LZC study [TBA-Q1-XX-RP-N-00003] Appendix A the application site is located in an area which currently has no DHN, but straddles two of the four town centre clusters where DHN will be prioritised in the future. In line with the Sustainable Design and Construction SPD, space provisions will be made and capped off pipework provided for a future connection to a DHN.

The hybrid VRF system proposed for space heating in the Low and zero carbon section below can be adapted to work with a water-based energy source.

The ASHP for DHW could be replaced by a water-to-water system in due course.

However, as the DHN proposals are at a very early stage with unknown flow temperatures and carbon factors, at present no regulated carbon savings can be calculated in this step.

Low and zero carbon energy

An LZC study has been carried out and is reported in document TBA-Q1-XX-RP-N-00003. The following technologies are recommended in the report:

- + VRF heat pumps for heating and cooling and DHW preheat
- + 130m² PV on the roof

The following technologies were discounted on account of technical or economic issues:

- + Ground source heat pump
- + Biomass
- + Solar thermal
- + Wind turbines
- + District Heating

Following the recommendations of the report, heat pumps and PV were implemented in the design.

Heat pumps

A high efficiency VRF heat pump system will provide space heating (and cooling where required) in the foyer, restaurant, and bedrooms. A separate heat pump will provide pre-heat for the DHW to cover 80% of the DHW

energy demand. The remaining 20% will be provided by gas-fired water heaters in order to guarantee the high recovery rates required for the hotel bedrooms. Space heating to other spaces requiring heating only is via electric panel heaters.

Photovoltaics

A 130m² (28.6 kWp) south-facing array will be mounted on the roof of the building. The PV area will be attributed to the new built part of the building assessed under Part L2A for the purposes of carbon accounting and Ene01 calculations.

The cumulative energy and carbon savings after LZC measures are summarised in Table 5.

		Energy Savings		CO ₂ Emissions Savings			
		in %	in MWh / year	Part L		SAP10.2	
				in %	in tons CO ₂ / year	in %	in tons CO ₂ / year
After VRF	Refurbishment/ Extensions	126%	313.0	27%	37.9	65%	73.0
	New build	55%	136.5	45%	26.3	72%	36.6
After PV	Refurbishment/ Extensions	126%	313.0	27%	37.9	65%	73.0
	New build	66%	163.5	45%	26.3	72%	36.6

Table 5 energy and carbon savings after LZC measures

BREEAM Ene01 credits

The areas within the scope of the BREEAM Bespoke RFO2014 assessment may be subjected to different methods of assessing Ene01 depending on whether they are deemed new, to be confirmed by the BRE in due course.

For the purpose of assessing Ene01 at the planning stage, we assessed the new build areas using the NC 2018 Ene01 calculator and the refurbished areas and extensions under the RFO 2014 Ene01 whole building energy model method.

The results in Table 6 show that under the split described above all parts of the building within the BREEAM scope achieve their mandatory Ene01 credits to achieve BREEAM Excellent.

Parts of building	Ene01 assessment method	Mandatory credits for Excellent	Ene01 credits achieved with energy strategy
Refurbishment/extensions	BREEAM RFO 2014 Whole building energy modelling	6	7
New build	BREEAM NC 2018 Ene01	4	4

Table 6 BREEAM Ene01 results

5.0 Conclusions

Dynamic thermal modelling was undertaken to develop an energy strategy suitable for the needs of the building while also achieving Part L compliance and the mandatory credits for a BREEAM Excellent rating.

Table 7 summarises the cumulative energy and carbon savings after each step relative to the Ene04 Standard building, leading to achievement of the mandatory BREEAM Ene01 credits for BREEAM Excellent. The new build part of the building as designed achieves an improvement over PartL2A of 38.4% (see BRUKL in Appendix D).

	Steps	Energy Savings		CO ₂ Emissions Savings			
		in %	in MWh/year	Part L		SAP10.2	
				in %	in tons CO ₂ /year	in %	in tons CO ₂ /year
Refurbishment	Passive Design	4%	10.6	2%	2.2	2%	2.2
	Active Design	15%	36.4	11%	14.8	5%	5.9
	LZC	126%	313.0	27%	37.9	65%	73.0
New build	Passive Design	4%	10.2	4%	2.2	4%	2.2
	Active Design	8%	19.2	11%	6.4	7%	3.5
	LZC	66%	163.5	45%	26.3	72%	36.6

Table 7 Summary of the impact of energy performance measures relative to the Ene04 Standard building baseline

Table 8 summarises the design measures taken to achieve the E ne01 credits.

Design measure		New build	Refurbishment/Extension
Fabric improvements	U value	See Table 1	
	Air permeability		
MEP	Heating	VRF system with heat recovery SCOP5.5	
	DHW	80% ASHP with SCOP2.8, 20% gas-fired water heater, 93%	
	Cooling	VRF system, SEER-6.5	
	MVHR	SFP=0.9W/l/s, 85% HR	
	Lighting	100lm/W	
Renewables	PV	130m ² , 22% efficient, 10° inclination, south-facing	None

Table 8 Summary of applied energy performance measures

Appendix A – BREEAM Bespoke Application Process

BREEAM Buildings (New Construction and Refurbishment and Fit Out)

The bespoke process for BREEAM buildings allows those that are not considered to be “standard” to be assessed and certified against BREEAM. The scope section of each of the BREEAM technical manuals (SD5076, SD5075, SD216, and SD225) defines the “standard” building types covered by that scheme. For any other building types, the bespoke process will be required.

Principles of bespoke assessments

In the bespoke process, BREEAM criteria are selected and amended for that specific project. Amendments and additions to the standard criteria reflect the unique use and sustainability opportunities of the project and the location. Although the bespoke process involves amending criteria for individual developments, it still adheres to a set of standards in terms of BREEAM structure, credit method and content. This ensures the credibility of BREEAM is maintained.

The bespoke method adheres to some basic fundamentals:

- + Assessment criteria from the related BREEAM scheme will form part of the criteria set.
- + Assessment criteria applicable to the development’s function and location will form part of the criteria set.
- + Where necessary, these criteria will be tailored to the development’s function and location.
- + Internationally, local codes and standards will be incorporated.

Please note the purpose of criteria development is not:

- + To remove those assessment criteria that may be difficult to achieve

- + for the project; or
- + To develop extensive new criteria or guidance for existing criteria unless this is determined to be beneficial to the sustainability of the development.

This should be discussed with BRE Global when applying for bespoke criteria if thought to be relevant.

The Bespoke Process

1. Enquiry and application form

Enquiries regarding the development of BREEAM Bespoke criteria should be directed to breeam@bre.co.uk. The first step in the bespoke process is the completion of an application form for the relevant scheme. The application form should be completed and returned to breeam@bre.co.uk with an up-to-date set of project plans if possible. The application form contains further guidance on how it should be completed.

2. Proposal issue and acceptance

On receiving the completed application form and project plans BRE Global will issue a proposal outlining the costs, timescales and terms and conditions for developing BREEAM Bespoke criteria within 7 days. All proposals should be accepted by the client using the proposal acceptance form at the end of the proposal letter.

Fees: The fees for bespoke criteria development are quoted at a rate that is commensurate with the complexity of the project. The quoted fee will include staff costs and where required, any travel expenses to be accrued by BRE Global for a project development meeting (refer to section 6 below). Payment must be made to BRE Global upon acceptance of the proposal.

3. Registration of assessments

The project should be registered as soon as possible using the online registration forms via the BREEAM Assessor extranet or BREEAM Projects website. Please refer to the operations guidance found in SD 5070 for further information.

4. First criteria issue

On receipt of the completed proposal acceptance and payment, BRE Global will develop the first output of the bespoke process as detailed below for each of the applicable BREEAM schemes. The assessor should review these

documents alongside the relevant BREEAM technical manual, including all generic compliance notes and evidence requirements with relevant members of the project team and local experts, where appropriate. The estimated duration for BRE to issue the first criteria set is three weeks.

5. Criteria review

The first criteria issue shall be reviewed by the assessor and project team. The assessor or project team may wish to request amendments to the criteria where it is believed these are not appropriate. Amendment requests should be justified and collated by the assessor and returned to BRE Global.

6. Amended/final criteria

Once the amendment requests have been returned to BRE Global they will be reviewed. Where further clarification is required, this will be requested by BRE Global within 3 weeks. Otherwise, the amended/final assessment criteria will be issued to the assessor and client (also within 3 weeks).

Please note, once the amended/final criteria have been agreed and issued, the contractual agreement between BRE Global and the client is complete. If the client requests amendments to the final criteria this will incur an additional cost and should be communicated with BRE Global via BREEAM@bre.co.uk.

Appendix B – BREEAM Pre-Assessment Tables

Management						
Man 01 - Project brief and design						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Stakeholder consultation (project delivery)	1	1	1	1	To achieve this credit, the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery, and there is a clear sustainability brief, prior to completion of the Concept Design (RIBA Stage 2). Design team meeting feedback confirms consultations undertaken. Please refer to the BRE definitions under Man 01. To be undertaken immediately due to the credit's Stage 2 requirement. <u>Suggested design stage evidence:</u> • Consultation plan • Sustainability brief • Roles and responsibilities matrix
2	Stakeholder consultation (third party)	1	1	1	1	To achieve this credit, relevant third-party stakeholders have been consulted by the design team prior to completion of the Concept Design stage, with feedback to be provided by RIBA Stage 4. <u>Suggested design stage evidence:</u> • Consultation plan • Sustainability brief • Roles and responsibilities matrix
3	Sustainability Champion (design)	1	1	1	1	Appointment of a BREEAM AP required at (RIBA Stage 1) Preparation and Brief Stage to facilitate the formal setting and achievement of BREEAM performance targets for the

						project during (RIBA Stage 2) Concept Stage. <u>Suggested design stage evidence:</u> • Meeting Minutes • Confirmation Letter
4	Sustainability Champion (monitoring progress)	1	1	1	1	Credit requires the above credit to be achieved and ongoing monitoring and support from the BREEAM AP. <u>Suggested design stage evidence:</u> • Meeting minutes • Email communication of progress reports • Confirmation letter
Man 02 - Life cycle cost and service life planning						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Elemental life cycle cost (LCC)	2	0	0	2	This credit is not targeted for Scenario 1 and 2. Potential for Scenario 3. LCC typically presents a high appointment cost versus the score uplift provided, and benefit of the exercise to the project. An LCC is carried out in RIBA Stage 2 to inform the expected lifecycle cost of the whole building. An outline, entire asset elemental life cycle cost (LCC) plan has to be carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008. <u>Suggested design stage evidence:</u> • Elemental LCC report • Evidence confirming how LCC plan has been used to influence building and systems design
2	Component level LCC option appraisal	1	0	0	1	A component level LCC plan can be developed by the end of Process Stage 4 (equivalent to Technical Design RIBA

						Stage 4) in line with PD 156865:2008 and includes an OPEX vs CAPEX cost analysis against building fabric , core services, local services and interior finish options. Scenario 3 target due to cost uplift as per previous credit comment. <u>Suggested design stage evidence:</u> • Component level LCC report • Evidence confirming how LCC plan has been used to influence building and systems design
3	Capital cost reporting	1	1	1	1	The capital cost of the fit-out works is reported in £/m2. Reference should be made to the BREEAM Man 02 definition for the scope of the costs to include. Cost consultant. <u>Suggested design stage evidence:</u> Capital cost in £/m2
Man 03 - Responsible construction practices						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
Pre-req 1	Pre-Requisite		✓	✓	✓	All timber and timber-based products are to be legally harvested and traded timber as per the UK government requirements. The architect has confirmed their adherence to this legal requirement within the design team meeting. The contractor preliminaries are to ensure contractor adherence. Please note this is a mandatory requirement to achieve BREEAM certification. <u>Suggested design stage evidence:</u> • Contractors Preliminary Contract • Confirmation letter from Client to confirm the prelim contract has been issued and accepted.

1	Environmental management	1	1	1	1	The principal contractor is to operate a third-party certified ISO 14001, EMAS, or have a BS8555:2003 compliant structure in implementation stage, as well as adhere to PPG6 guidelines on site during all operations. This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
2	Sustainability Champion (construction)	1	1	1	1	A sustainability champion shall be appointed by the principal contractor to monitor BREEAM targets during construction, handover, and close out stages. Regular site visits at key stages are to be undertaken. The appointed person must be qualified as either a BREEAM AP, or BRE Site Sustainability Manager and listed on the Green Book Live - http://www.greenbooklive.com/search/scheme.jsp?id=172 This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
3	Considerate construction	2	2	2	2	The contractor shall be required to meet exemplary levels of performance in the Considerate Constructors scheme. In response to the 2022 changes to the structure and scoring in the CCS, the adjusted points for credits are as follows for each of the three new sections; Community, Environment and Workforce: One credit requires a minimum of 9points per section and 27 overall. Two credits require a minimum of 11 points per section and 35 overall. Exemplary credit requires a minimum of 13 points per section and 39 overall.

						This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
4	Monitoring of construction site impacts - Utility consumption	1	1	1	1	The contractor shall be required to monitor site energy consumption in kWh throughout their construction period (electricity, and litres of fuel if relevant) from all construction plant, equipment, and site accommodation. Net water consumption is also to be monitored and recorded in cubic meters. This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract
5	Monitoring of construction site impacts - Transport of construction materials & waste	1	1	1	1	Monitor and record data on transport movements and impacts resulting from delivery of the majority of refurbishment or fit-out materials to site and refurbishment, fit-out and demolition or strip-out waste from site. This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
e1	Considerate Construction: Exemplary performance	1	1	1	1	Refer to Man 03 Considerate Construction.

Man 04 - Commissioning and handover						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
Pre-req	Pre-Requisite (Excellent & Outstanding only)		✓	✓	✓	A Building User Guide is to be developed or an existing Building User Guide is updated, prior to handover for distribution to the building occupiers and premises managers. These are to follow the minimum content guidelines from the BRE manual. Contractor preliminaries or third-party appointment of BUG author. This will be confirmed via the tendering process.
1	Commissioning and testing schedule and responsibilities	1	1	1	1	A schedule of commissioning and testing shall be provided with a timescale for commissioning and recommissioning of building services, their control systems, and changes to building fabric. The appointed person to manage should be identified by the contractor. The BMS must be commissioned to when all air and water systems are being commissioned, the controls should be running automatically, all graphics and schematic present, and the FM/occupier is training in the system. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted. - M&E specification/strategic programme or schedule of commissioning
2	Commissioning building services	1	1	1	1	A specialist commissioning manager (SCM) is required to be appointed at design stage to undertake design reviews, give advice on suitability, and provide management input during programming and installation, and management of commissioning, testing, and handover. <i>Please note: The SCM is required to be appointed at design stage.</i> <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.

						Letter of appointment & scope of work of specialist commissioning manager, if appointed by client at design stage
3	Testing and inspecting building fabric	1	0	1	1	Potential Credit within scenario 2 and 3. Note that this credit may require extensive post construction snagging and remediation if thermographic faults are found within the finished construction works. The mixture of new and existing building elements may present challenges in air testing and infrared scanning. Thermographic survey, airtightness testing, and visual inspection to be carried out at appropriate times during the refurbishment by a Suitably Qualified Professional (Expected membership of ATTMA, iATS for air testing, and UKTA level 2 certificate holder for thermographic survey). Any defects found to be rectified. Typical evidence usually includes a survey report from the thermographer in accordance with all necessary standards and current regulations. It is advised that the survey is carried out outside the summer months to ensure a minimum of 10C for at least 12 hours prior to the survey. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
4	Handover	1	1	1	1	Required for Very Good: The contractor shall be required to produce a Building User Guide (BUG) and provide it to the occupiers and premises managers prior to handover. A training schedule is also required which sets out training during handover. TB+A specification often include these requirements and contribute to the creation of the Building User Guide. This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u> Contractors Preliminary Contract

						- Confirmation letter from Client to confirm the prelim contract has been issued and accepted. - Letter of confirmation
Man 05 - Aftercare						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Aftercare support	1	1	1	1	To achieve this credit, operational infrastructure and resources must be in place to provide aftercare support to the building occupier following the BREEAM criteria. Additionally, there will be collection and monitoring of energy and water consumption data for a minimum of 12 months once the building is occupied. Discrepancies between expected and actual performance should be identified and addressed. This can be included in the contractor preliminaries. Credit confirmed by TP Bureau via email. <u>Suggested design stage evidence:</u> Commitment letter
2	Seasonal commissioning	1	1	1	1	Required as part of Excellent rating. The Contractor shall appoint an independent specialist commissioning manager over a minimum 12-month period to undertake commissioning responsibilities including: - testing all building services under full load conditions; - carrying out testing during periods of extreme (high or low) occupancy; - interviewing building occupants; - producing monthly reports comparing sub-metered energy performance to the predicted performance; - and re-commissioning systems where necessary. This will be confirmed via the tendering process. <u>Suggested design stage evidence:</u>

						Commitment letter
3	Post occupancy evaluation	1	1	1	1	Confirmed by TP Bureau in the correspondences on 20th June. The client or building occupier makes a commitment to carry out a post occupancy evaluation (POE) exercise one year after initial building occupation. The POE is carried out by an independent party. The client or building occupier makes a commitment to carry out the appropriate dissemination of information on the buildings post occupancy performance. <u>Suggested design stage evidence:</u> Commitment letter
e1	Aftercare / monitoring: 3 years	1	1	1	1	Confirmed by TP Bureau in the correspondences on 20th June. Operational infrastructure is required to be in place to coordinate collection of occupant satisfaction, energy consumption and water consumption data at quarterly intervals for the first three years of building occupation. Targets are to be set to reduce water and energy consumption and feedback given to the design team for future projects. <u>Suggested design stage evidence:</u> Commitment letter
		21	17	18	21	Standard Management Credit Total
		2	2	2	2	Exemplary Management Credit Total
		16.49	13.73	14.42	16.49	% Management Total (Standard + Exemplary)

Health & Wellbeing						
Hea 01 - Visual Comfort						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Glare control	1	1	1	1	Glare control measures will need to be specified on all applicable windows (exclusively in areas at risk of glare). The strategy shall avoid increasing light energy consumption by being designed to utilise natural light and will not conflict with the lighting control systems. Note: If these are blinds, they shall be required to have a transmittance value of 10% or less. Credit is typically achieved as requirements for the blind's transmittance value is not onerous. Confirmed as targetable by FCH Architects during the pre-assessment meeting. <u>Suggested design stage evidence:</u> - Manufacturers datasheet for any glare control items/architectural specifications - Design drawings showing glare control within the floor plans/elevations
2	Daylighting	3	0	0	1	Not targeted for Scenario 1 and 2. The current layout of rooms within the hotel general area drawings, and local massing surrounding the site, suggests difficulties in sufficient daylight provision. Some functional areas have restricted daylight. Historical constraints may impact on the level of modification possible in glazing. If this credit is undertaken, it would be at large expense and potential risk of failure. The building design shall be required to demonstrate internal 2% average daylight factor across 40% of the floor space with a uniformity ratio of 0.3 for 1 credit, 60% for 2 credits. Alternatively: Two credits where daylighting provision, averaged over all relevant spaces, has improved after refurbishment or fit-

						out by 30% or more and there is a minimum glazing to floor area ratio of either 5% glass to floor area ratio for side windows; OR 2.5% glass to floor area ratio for roof lights; One credit where daylighting provision, averaged over all relevant spaces, has improved after refurbishment or fit-out by 15% or more and there is a minimum glazing to floor area ratio of either: 5% glass to floor area ratio for side windows; OR 2.5% glass to floor area ratio for roof lights The requirement is 80% of floor area to have daylight factor of 2% and minimum point daylight factor of 0.8%. <u>Suggested design stage evidence:</u> Daylighting calculations
3	View out	2	0	0	0	Credit not expected to be achieved within the current fundamental design due to proximity of existing surrounding buildings reducing the length of view out to less than 10m. Functional areas under the scope of "View out" are restricted in outdoor views. For reference, the first credit can be achieved if 80% applicable floor area within 7m of a window, or an atrium with an unobstructed view across 10m externally. A second credit may be possible if a larger 95% of areas comply. FCH Architect <u>Suggested design stage evidence:</u> View out calculations and mark ups on floor plans and elevations
4	Internal and external lighting levels, zoning and control	1	1	1	1	All internal lighting to be high frequency ballasts where fluorescent. Internal lighting lux to meet SLL Code for Lighting 2012. Areas with computer screens to meet CIBSE LG7 sections within the BREEAM manual.

						External lighting to meet BS 5489-1:2013, and BS EN 12464-2:2014. Internal lighting to allow for the following zoning: - Office areas of no more than 4 workplaces per zone (this can be increased with justification). - Workstations adjacent to windows/atria to have individual controls - Dining, restaurant, and cafe areas to have separate zoning of servery and seating areas. - Retail and bar areas for separate zoning of bar/display, and display/counter areas. Credit determined targetable within the pre-assessment workshop MEP <u>Suggested design stage evidence:</u> • Internal and external lighting plans; calculations, specifications and schedule
e1	Daylighting: Exemplary levels	1	0	0	0	Not targeted due to lack of expected performance in daylighting credit.
Hea 02 - Indoor Air Quality						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Indoor air quality (IAQ) plan	1	1	1	1	An indoor air quality plan has been prepared with the objective of facilitating a process to minimise indoor air pollution during design, construction, and occupation. Measures to be put in place shall include removal of contaminants, dilution and control, pre-occupancy flush-out. Typically provided by the contractor as standard practice. This can be provided by the MEP engineers during design stage. <u>Suggested Design Stage evidence:</u> • Indoor air quality plan

2	Ventilation	1	0	1	1	The design shall provide fresh air in accordance with the relevant standards. Intake and exhausts are to be 10m from each other and 20m from external pollution. Filtration to be provided. Any areas of large and unpredictable occupancy shall be required to use CO2 sensors to provide demand-controlled ventilation. MVHR units are suggested across areas which demand them. Important to note where units will be placed, and that natural vent supplied areas are not close to sources of external pollution. Potential for credit to be lost if pollution is closer than 10m. This was discussed in pre-assessment meeting that side grills will be used rather than large risers going through the building. MEP <u>Suggested Design Stage evidence:</u> • Mechanical services drawings and specifications • File note on ventilation strategy
3	Volatile organic compound (VOC) emission levels (products)	1	1	1	1	All decorative paints and varnishes and at least five of the seven remaining product categories (Timbers, suspended ceiling finishes, flooring adhesives, wall coverings (roll form) specified will be required to meet the emission levels criteria for VOCs. FCH Architects <u>Suggested Design Stage evidence:</u> • VOC product specification • Proforma confirmation letter
4	Volatile organic compound (VOC) emission levels (post construction)	1	1	1	1	The Contractor shall undertake post construction testing. Formaldehyde and TVOC (Total volatile organic compound) levels shall be tested to meet BREEAM required levels. Remediation flush out required if the measured levels are exceeded. <u>Suggested Design Stage evidence:</u>

						Contractor's Preliminary Contract
5	Potential for natural ventilation	1	0	0	0	Credit not targeted due to BREEAM requirement for entire development to have access to potential natural ventilation only systems. Two levels of user control required. <u>Suggested Design Stage evidence:</u> - File note on ventilation strategy - Design drawings
e1	VOC emissions (post construction): Exemplary levels	2	0	0	1	Credit is only targeted in scenario 3 as the stringent level of certification required could easily fail with the introduction of a single non-compliant product. All seven remaining product categories listed in Table 20 meet the testing requirements and emission levels criteria for Volatile Organic Compound (VOC) emissions (listed in the table). For products B F listed in Table 20 , the formaldehyde emission levels have been measured and found to be less than or equal to 0.06mg/m3 air in accordance with the approved testing standards in Table 20. Not targeted for Scenario 1 and 2 due to onerous requirements. Assessor to remain aware of credit in case of potential achievement.
Hea 04 - Thermal comfort						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Thermal modelling	1	1	1	1	A CIBSE AM11 compliant thermal model shall be required to confirm that summer and winter operative temperature ranges in occupied spaces are within the criteria for

						CIBSE Guide A Table 1.5. Air-conditioned buildings are required to provide their PMV and PPD indices to the BRE. MEP <u>Suggested design stage evidence:</u> Thermal comfort report
2	Adaptability - for a projected climate change scenario	1	1	1	1	As per the thermal modelling above but run with future weather files to determine if the building will pass in a projected climate change scenario. If the building fails, passive measures will need to be provided in order to achieve this. MEP <u>Suggested design stage evidence:</u> Thermal comfort report
3	Thermal zoning and controls	1	1	1	1	Thermal modelling analysis to be carried out to confirm that this credit is compliant. Thermal strategy should comply with this credit. The thermal analysis as per credit 1 to inform the temperature control strategy for the building. This strategy is to cover all items specified within the BREEAM guidance. MEP <u>Suggested design stage evidence:</u> Thermal zoning strategy and plans
Hea 05 - Acoustic Performance						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Acoustic performance	4	3	3	3	Please note historical buildings can meet credits using CN10 in cases of substandard performance at PC testing. A Suitably Qualified Acoustician (SQA), KP Acoustics, has been appointed, to confirm that all performance requirements are met as per Approved Document E 2003 edition, with amendments 2004 and 2010 Resistance to the passage of sound. This will be reconfirmed throughout the design stage.

						Remedial works shall be undertaken within areas of non-compliance during pre-completion testing. To achieve one credit, airborne sound insulation values are at least 3dB higher and impact sound insulation values are at least 3dB lower than the performance standards in the relevant Building Regulations or Standards. To achieve three credits, at least 5dB higher and impact sound insulation values are at least 5dB lower than the performance standards. To achieve four credits, at least 8dB higher and impact sound insulation values are at least 8dB lower than the performance standards. Please note: A suitably qualified acoustician (SQA) is one that holds a degree or equivalent in acoustics/sound testing, has 3 years practical experience, and holds a membership with a professional body. <u>Suggested design stage evidence:</u> • CV and/or cover letter demonstrating SQA qualification criteria • Design acoustic report
Hea 06 - Safety and Security						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Security of site and building	1	1	1	1	An SQSS (Suitably qualified security consultant) will need to be appointed and conduct a review of the local areas, existing building, and identify risks to the building. These are to be documented within a SNA, (Security Need Assessment) which measures recommended can then be implemented. To be conducted at RIBA Stage 2. Late appointment can still be justified by the SQSS if their works are not impacted by this. Secured by Design would provide most of the SNA required items and is expected as part of the design stages during pre-assessment discussion. The SQSS

						however will still need to be appointed. <u>Suggested Design Stage evidence:</u> • CV and/or cover letter demonstrating SQSS qualification criteria • SNA minutes/of existing building • Drawings and/or specs confirming any recommendations have been incorporated into the design
		20	12	13	14	Standard Health & Wellbeing Credit Total
		3	0	0	1	Exemplary Health & Wellbeing Credit Total
		19.60	9.96	10.79	12.62	% Health & Wellbeing Total (Standard + Exemplary)
Energy						
Ene 01 - Reduction of energy use and carbon emissions						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Energy performance	15	7	9	10	Option 1 selected: Currently, 7 credits are targeted under Scenario 1 as a safety buffer against energy model changes in the future design stages. This has been modelled by TB+A during the pre-assessment stage. Scenarios 2 and 3 increase these by 1 credit to reflect potential improvement throughout the design stages. As the project will require an Excellent rating against the Reading Council requirements due to floor area appears to be over 1000m², 6 credits need to be achieved at minimum. It was previously agreed that 10 credits can be achieved under Scenario 1 however, subsequent area change within QVS1 has reduced the overall new-built area, and thus new build fabric on-site. Therefore the achieved credits have been reduced to 7 for Scenario 1 in order to provide a safety buffer. This is to be revisited in the design stage. It is expected that either a single model approach using

						CN6 (RFO2014), or a blended proforma and model approach will be required as the project is registered against a bespoke criteria. Option 1: Whole building energy model For projects that want to gain recognition for improvements made at the whole building level, using whole building energy modelling National Calculation Methodology (NCM) compliant software Option 2: Elemental level energy model For projects where the scope of work is limited to a single or multiple assessment part (from parts 1, 2, 3 and 4) such as partial or minor refurbishment projects and fit-out projects. This option can, however, be used by projects undertaking a full refurbishment (all assessment parts).
e1	Zero regulated carbon / carbon negative	5	0	0	0	Not targeted as the energy strategy does not meet levels required for zero regulated carbon and carbon negative buildings. MEP
Ene 02 - Energy Monitoring						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Sub-metering of major energy consuming systems	1	1	1	1	Energy metering systems shall be installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems using an appropriate energy monitoring and management system. As this is part refurbishment of an existing building, refer to CN7. Please note this is a mandatory requirement to achieve a minimum of Very Good rating. This is likely to be achieved as a matter of standard practice when designing a building to building regulations. The design stage assessor is to review and confirm after design freeze. MEP <u>Suggested design stage evidence:</u> • MEPH Specification covering sub-meters and BMS

						- Design Schematics - Sub metering strategy/file note
Ene 03 - External Lighting						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	External lighting	1	1	1	1	The average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt. All external light fittings are automatically controlled to prevent operation during daylight hours and have presence detection in areas of intermittent pedestrian traffic. MEP <u>Suggested design stage evidence:</u> - MEPH Specification covering external lights - Design Schematics
Ene 04 - Low carbon design						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Passive design - Passive design analysis	1	1	1	1	<i>Hea04 credit 1 must be achieved to proceed.</i> A passive design analysis report has been carried out at RIBA Stage 2 and identifies opportunities for the implementation of passive design solutions and retrofit measures that reduce demands for energy consuming building services. Appropriate measures are to be implemented into the building design and the credit awarded at later design stage. MEP <u>Suggested design stage evidence:</u> Passive design analysis
2	Passive design - Free cooling	1	0	0	0	The passive design analysis, carried out under criterion 2, includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions.

						The building is naturally ventilated utilising any combination of the free cooling strategies listed in CN8. It's expected that areas of the building will require mechanical services to meet thermal comfort. Free cooling technologies are not being specified within the development. MEP.
3	Low and zero carbon technologies - LZC feasibility study	1	1	1	1	A feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by the energy specialist to establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy source(s) for the building/development. A meaningful reduction in emissions has been demonstrated. (See KBCN00027). The results are likely to vary from design changes to the building as RIBA stages progress. As such, credit compliance will be awarded at design stage freeze. MEP <u>Suggested design stage evidence:</u> • Feasibility Study • CV for the energy specialist • Results from a dynamic simulation model demonstrating demand reductions from the specified low zero carbon technology
Ene 05 - Energy Efficient Cold Storage						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Refrigeration energy consumption	1	0	1	1	This credit does not apply to domestic or catering scale white goods, refrigerated display cabinets, walk in fridge and freezers. Cold storage areas are expected. Currently within scenario 2 and 3. The refrigeration system, its controls and components have been designed, installed and commissioned as follows: 1. In accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector¹ (see Other information) and BS EN 378-2

						Refrigeration systems and heat pumps - Safety and environmental requirements. 2. Using robust and tested refrigeration systems/components, normally defined as those included on the Enhanced Capital Allowance (ECA) Energy Technology Product List (ETPL)² or an equivalent list (see CN8 for a list of components). The refrigeration plant will be commissioned to comply with the criteria for commissioning outlined in BREEAM issue Man 04 Commissioning and handover. Cold Storage Designer/MEP
2	Greenhouse gas emissions from energy use	1	0	1	1	The installed refrigeration system demonstrates a saving in greenhouse gas emissions from energy use (CO ₂ eq.) over the course of its operational life.
Ene 06 - Energy Efficient Transportation Systems						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
2	Energy efficient features	2	2	2	2	Lift energy Assessment has been confirmed by TP Bureau on 20th June. Credit 1: An energy efficiency study is undertaken to BS EN ISO 25745 standards against potential lift options. The most efficient lift is to be specified. Credit 2: Each newly specified lift is to contain a standby feature, lighting efficacy of over >55 lamp lumens per circuit watt, and VVVF drive motors. Where the use of regenerative drives is demonstrated to save energy, they are also specified. Lift consultant <u>Suggested design stage evidence:</u> • Transport systems analysis report • Energy Analysis report • Lift specifications

Ene 08 - Energy Efficient Equipment						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Energy efficient equipment	2	2	2	2	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. Identify the systems and/or processes that use a significant proportion of the total annual unregulated energy consumption of the development and its operation. Demonstrate a meaningful reduction in the total annual unregulated energy consumption of the building. MEP/Client <u>Suggested Design Stage evidence:</u> • Total energy load calculation and breakdown of unregulated energy consuming systems/operations • List of Equipment specified and their specifications/datasheets. Example categories include small power/plug in equipment; kitchen and catering; and IT intensive operating areas. 90% of the total unregulated energy load is to be accounted for.
		26	15	19	20	Standard Energy Credit Total
		5	0	0	0	Exemplary Energy Credit Total
		23.20	10.5	13.30	14	% Energy Total (Standard + Exemplary)
Transport						
Tra 01 - Sustainable transport solutions						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Sustainable transport solutions	5	5	5	5	A preliminary check suggested full credits can be achieved due to the proximity to multiple bus stops, Reading station, coaches, and the new Elizabeth line connection. Assessor

						<u>Suggested design stage evidence:</u> • PTAL report
Tra 02 - Proximity to amenities						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Proximity to local amenities	1	1	1	1	The building is located within proximity of and accessible to at least 2 local amenities such as food outlets, access to cash, and recreation/leisure facility for fitness/sports. Assessor <u>Suggested design stage evidence:</u> • Location map showing distances from assessed building to the amenities • Evidence to confirm safe pedestrian routes
Tra 03 - Cyclist facilities						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Cycle storage	1	0	1	1	According to the Draft Travel Plan by Mode Transport, a maximum of 20 staff on site at any one time is expected, therefore 4 cycle parking spaces will be provided. In order to finalise the credit, the building type under Transport Issue needs to be clarified to identify the cycle storage that needs to be supplied. Please refer to CN19 which confirms transient visitors for building such as hotels confirms cyclist facilities are only required for staff. Cycles are to be secured within spaces or rack(s). They are to be covered overhead and set in or fixed to a permanent structure (building or hardstanding). The distance between each cycle rack, and cycle racks and other obstructions should allow easy access and storage. The storage facility or entrance to the facility is to be in a prominent site location that is viewable or overlooked or signposted. The cycle storage facility has adequate lighting The

						lighting must be controlled to avoid out-of-hours use and operation during daylight hours, where there is sufficient daylight in or around the facility. <u>Suggested design stage evidence:</u> • Confirmation of building users (students and staffs) of entire building if cycle storage spaces are shared/otherwise, the occupancy for the assessed building. • Floor plans denoting allocated BREEAM compliant cycle spaces and facilities • Confirmation/documentation demonstrating that criteria for compliant cycle storage
2	Cyclist facilities	1	0	1	1	A credit can be awarded when two of the following are provided in line with BREEAM requirements: • Adequate drying space • Lockers • Showers • Changing facilities The Draft Travel Plan states that the lockers and changing facilities will be provided. Therefore 1 credit can be awarded at later design stage, pending any potential design changes.
Tra 05 - Travel Plan						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Travel plan	1	1	1	1	A site specific draft travel plan has been prepared as part of the design stage works which is applicable to all building users. The report has been produced within the correct RIBA stage to address the BREEAM appointment time requirements. Design stage assessor to reference and confirm credit. Transport measures will need to be confirmed via the client. <u>Suggested design stage evidence:</u>

						- Travel plan and travel statement/assessment, as applicable - Letter of commitment
		9	7	9	9	Standard Transport Credit Total
		0	0	0	0	Exemplary Transport Credit Total
		7.29	5.67	7.29	7.29	% Transport Total (Standard + Exemplary)
Water						
Wat 01 - Water Consumption						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Water consumption	5	2	2	2	Low flow sanitary fittings should be specified to achieve 2 credits. The specification of low flow sanitary fittings should be able to demonstrate at least a 25% improvement over the BREEAM baseline for water consumption. FCH Architects/MEP It is not expected that further credits can be achieved without significant restriction on showers, which may impair customer satisfaction. <u>Suggested design stage evidence:</u> - Sanitary-ware schedule and specifications showing flow rates and number of fittings - Product datasheets - Floor plans - Area schedule
e1	Water consumption: Exemplary levels	1	0	0	0	Development does not have any features such as rainwater harvesting or greywater systems which allow for this credit to be achieved. The site size may not allow for these types of systems to be implemented.

Wat 02 - Water Monitoring						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
Pre-req	Pre-requisite (Good to Outstanding ONLY)		✓	✓	✓	The specification of a water meter on the mains water supply to each building. Any rating beyond Pass requires a mains water meter as a mandatory requirement.
1	Water monitoring	1	1	1	1	Mandatory for Very Good: Water-consuming plant or building areas, consuming 10% or more of the buildings total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area. Each meter (main and sub) has a connection to an appropriate utility monitoring and management system. MEP <u>Suggested design stage evidence:</u> • Annotated water schematics • Sub metering strategy and/or specification • BMS Specification
Wat 03 - Leak Detection						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Leak detection system	1	1	1	1	A leak detection system capable of detecting a major water leak on the mains water supply between the building and utility water meter is installed and meets BRE requirements 1a-1e. MEP <u>Suggested design stage evidence:</u> • Annotated water schematic • Specifications • Product details (Manufacturer datasheet)

2	Flow control devices	1	1	1	1	Flow control devices that regulate the supply of water to each WC area/facility according to demand are installed (and therefore minimise water leaks and wastage from sanitary fitting networks). The system must be designed to avoid any risk of scalding from shut off. The credit and criteria is applicable to buildings with guest bedrooms with en-suite facilities, e.g. hotel rooms, and communal WC areas/facilities, e.g. communal WC facilities in hotels/hostels and care homes. MEP <u>Suggested design stage evidence:</u> • Annotated water schematic • Specifications • Product details (Manufacturer datasheet)
Wat 04 - Water Efficient Equipment						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Water efficient equipment	1	1	1	1	Identify all water demands from uses other than (WCs, urinals, taps (wash-hand basins and, where specified, kitchen taps and waste disposal unit), showers, baths, dishwashers (domestic and commercial-sized, washing machines (domestic and commercial or industrial sized)) that could be realistically mitigated or reduced. Potential for planted areas to be irrigated or watered via watering can. Where this credit is not suitable, it can be scoped out of assessment. FCH Architects/ MEP <u>Suggested Design Stage Evidence:</u> • Letter or calculation sheet • Regularly compliance is demonstrated through use of a signed letter, stating that irrigation has not been used

	9	6	6	6	Standard Water Credit Total	
	1	0	0	0	Exemplary Water Credit Total	
	8.29	4.86	4.86	4.86	% Water Total (Standard + Exemplary)	
Materials						
Mat 01 - Life Cycle Impacts						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Life cycle impacts	6	3	3	6	Currently only 3 credits are targeted for Scenario 1 and 2 as the additional appointment and cost uplift associated with LCA would be problematic to the development budget. Correspondence received to confirm this on the 20th of June. Targeted: The internal walls and partitions, and floor finishes specified as part of the refurbishment are matched against the greenguide. Potential for Scenario 3: The project uses a life cycle assessment (LCA) tool or undertakes a building information model life cycle assessment (BIM LCA) to measure the life cycle environmental impact of the refurbishment or fit-out works. Where the design team can demonstrate how the LCA has benefited the building in terms of measuring and reducing its environmental impact. Possible extra 3 credits and 1 exemplary can be scored with further analysis and information. <u>Suggested design stage evidence:</u> • BREEAM UK RFO2014 Mat01 calculator • Schedule of finishes and specifications • Green guide ratings for specified internal floor finishes (including access floors), internal wall and partitions • Reflective statement from architect • OR LCA report

e1	Green Guide to Specification - Exemplary performance	1	0	0	1	Potential to achieve if a greater detailed level LCA is undertaken incorporating a larger scope than the Greenguide method.
Mat 03 - Responsible Sourcing of Materials						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
Pre-req	Pre-requisite		✓	✓	✓	All timber and timber-based products will be legally harvested and traded timber as per the UK government requirements. Contractor preliminaries to ensure contractor adherence. As this is a UK legal procurement requirement, it is likely to be achieved as standard practice. Please note this is a mandatory requirement to achieve BREEAM certification. <u>Suggested design stage evidence:</u> - Contractors Preliminary Contract - Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
1	Sustainable Procurement Plan	1	1	1	1	A sustainable procurement plan must be in place before Concept Design (RIBA Stage 2) and be used by the design team to guide specification towards sustainable construction products. It must include sustainability aims, objectives and strategic targets to guide procurement activities; include a requirement for assessing the potential to procure construction products locally; and include details of procedures in place to check and verify the effective implementation. <u>Suggested design stage evidence:</u> Contractors Preliminary Contract

						Confirmation letter from Client to confirm the prelim contract has been issued and accepted.
2	Responsible sourcing of materials (RSM)	3	1	1	1	One credit can be awarded where at least three of the material types listed in Table 53 'Material categories' has been responsibly sourced from one of the responsible sourcing schemes recognised by BREEAM as detailed in Guidance Note 18. If applicable building materials (Table 53 in Technical Manual) are responsibly sourced in accordance with the BREEAM Methodology, further credits could be awarded. FCH Architects/Contractor Prelims <u>Suggested design stage evidence:</u> - BREEAM contractor preliminaries - Documentary evidence detailing how the tool has been completed (i.e. Certificates, specifications) - Completed Mat03 calculator tool - Material specification and schedules
e1	Exemplary performance: Responsible sourcing	1	0	0	0	Unlikely to be achieved due to the onerous requirements this would place on procurement of materials. Many products are expected to lack clear or in-date EMS certification.
Mat 04 - Insulation						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Embodied impact	1	1	1	1	Any new building insulation specified within the fit-out scope of works shall be reviewed against the Green Guide rating and an insulation index calculated. One credit is achieved when the insulation index of at least 2.5 is achieved - calculated using the Mat 04 calculator. FCH Architects/MEP <u>Suggested design stage evidence:</u> - Specification documents/schedule with insulation product details and thermal conductivity - Insulation datasheet

						Completed MAT04 calculator
Mat 05 - Designing for durability and resilience						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Protecting vulnerable parts of the building from damage & protecting exposed parts of the building from material degradation	1	1	1	1	The building shall incorporate suitable durability and protection measures or design features/solutions to prevent damage to vulnerable areas. This includes protection from high pedestrian traffic in main entrances, public areas, and thoroughfares, and protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor, and kitchen areas. Environmental factors have been identified that are relevant to the site location and materials assessed to identify impacts of material degradation effects including an assessment to grade the severity of any degradation effects. Design and specification measures have been developed to repair and protect existing elements according to the severity of any degradation affects, to limit degradation. Where it is not feasible to implement measures to limit material degradation for existing elements, justification should be provided. FCH Architect/MEP/Structural <u>Suggested design stage evidence:</u> - Specification document - Sketch/mark up/drawings showing vulnerable areas and proposed protective measures - File note describing implemented measures

Mat 06 - Material efficiency						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Material efficiency	1	1	1	1	To achieve this credit, opportunities need to be identified and measures investigated and implemented within the refurbishment works to optimise and reduce the use of materials through building design, procurement, refurbishment, maintenance, and end of life. This is required to be carried out by the design/construction team at each of the RIBA Stages 1 to 5. The design team has set targets for Stage 1 and 2, therefore it has been targeted for Scenario 1. FCH Architect/MEP/Structural/Contractor <u>Suggested design stage evidence</u> • File note describing opportunities and strategies to optimise the use of material • Design specifications and drawings • BREEAM Contractor Preliminaries
		13	8	8	11	Standard Materials Credit Total
		2	0	0	1	Exemplary Materials Credit Total
		17.21	9.36	9.36	13.87	% Materials Total (Standard + Exemplary)
Waste						
Wst 01 - Construction Waste Management						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Pre-refurbishment audit	1	1	1	1	A pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition will be required. This aims, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. This must be carried out at Concept Design stage (RIBA Stage 2) by a competent person, prior to demolition works.

						To be undertaken either when prior to demolition contractor appointment, or via the demolition contractor. <u>Suggested design stage evidence:</u> • Pre-demolition audit
2	Reuse and direct recycling of materials	2	1	2	2	The contractor will either directly re-use on/off site or send back to the manufacturer for closed loop recycling applicable waste categories such as composite materials; new and used metal/plaster boards etc. one credit can be awarded for achieving 50%. It is recommended the contractor is encouraged to achieve 75% or more for two credits. At this stage, the second credit is in the final scenario for risk management. This will be confirmed via the tendering process. Please note that wastes sent to a Material Recovery facility, much like typical refuse, will not qualify as the re-use is not direct (i.e. Open loop recycling). Contractor <u>Suggested design stage evidence:</u> • Pre-demolition audit • BREEAM contractor's preliminaries • Wst01 tool. • SWMP
3	Construction resource efficiency	3	2	2	2	The principal contractor shall be required to develop and implement a resource management plan covering the waste arising from the project with the aim of minimizing waste. The non-hazardous waste produced during construction shall be targeted to be This will be confirmed via the tendering process. Contractor <u>Suggested design stage evidence:</u> • SWMP

						BREEAM contractor's preliminaries
4	Diversion of resources from landfill	1	1	1	1	One credit should be achieved where 90% of fit-out waste (tonnage) is diverted from landfill. This will be confirmed via the tendering process. Contractor <u>Suggested design stage evidence:</u> - SWMP - BREEAM contractor's preliminaries
e1	Resource efficiency / Diversion of waste from landfill: Exemplary performance	1	0	0	0	Category not expected to be achieved due to onerous requirements of the exemplary level and how this restricts the contractor programme and works.
Wst 02 - Recycled Aggregates						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Recycled aggregates	1	0	0	1	Not targeted for Scenario 1 and 2. Potential for Scenario 3 due to the large scale constraints this credit would place on procurement of aggregates. Pre-requisite - A pre-demolition audit of any existing buildings, structures, or hard surfaces in accordance with Wst01 is required to be completed during RIBA Stage 2. Project Sustainable Aggregate Points (1 credit) - The Contractor could be requested to identify all aggregate uses, types, and the quantity in tonnes on the project. The region in which the aggregate source is located and the distance in kilometres travelled shall be recorded. The Project Sustainable Aggregate points will then need to be calculated and if > 3.5 would qualify for a credit.
e1	Recycled aggregates: Exemplary performance	1	0	0	0	Exemplary levels of achievement are not expected to be met. Procurement and the requirement percentage of secondary or recycled aggregate is likely to be difficult or costly.

Wst 03 - Operational Waste						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Operational waste	1	1	1	1	Dedicated space(s) is provided for the segregation and storage of operational recyclable waste. This must be clearly labelled, accessible to building occupants or facilities operators and of a capacity appropriate to the building type, size. It is expected the minimum sizing requirement will be met, as the BREEAM requirements are not onerous. Where the consistent generation in volume of the appropriate operational waste streams is likely to exist, e.g. large amounts of packaging or compostable waste generated by the buildings use and operation, the following facilities are provided: Static waste compactor(s) or baler(s); situated in a service area or dedicated waste management space. Vessel(s) for composting suitable organic waste resulting from the buildings daily operation and use; OR adequate space(s) for storing segregated food waste and compostable organic material prior to collection and delivery to an alternative composting facility. Where organic waste is to be stored/composted on-site, a water outlet is provided adjacent to or within the facility for cleaning and hygiene purposes. FCH Architects <u>Suggested design stage evidence:</u> • Waste strategy • Floor plans showing waste store and bins • Details of signage • Letter of confirmation, if required by assessor

Wst 05 - Adaptation to climate change						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Adaptation to climate change structural and fabric resilience	1	1	1	1	Developing a climate change adaptation strategy at Stage 2 covering a structural and fabric resilience specific risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. FCH Architects/MEP <u>Suggested design stage evidence:</u> Climate change adaptation strategy appraisal
e1	Responding to adaptation to climate change	1	0	0	0	Credit not expected to be met as 3 credits are required in Wat 01. All of the following credits will need to have been achieved to demonstrate a holistic approach to the design and construction of the building's life cycle to mitigate against the impacts of climate change: - Hea 04 Thermal comfort - Ene 01 Reduction of energy use and carbon emissions - Ene 04 Low carbon design - Wat 01 Water consumption - Mat 05 Designing for durability and resilience - Pol 03 Flood and surface water management
Wst 06 - Functional adaptability						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Functional adaptability	1	0	1	1	A building-specific functional adaption strategy study is required to be undertaken by the client and design team by Concept design which includes recommendations for measures to be incorporated to facilitate future adaption. Before RIBA Stage 4, the functional adaptation measures are required to be adopted in the design in accordance with the recommendations at RIBA Stage 2. All omissions

						should be justified in writing to the assessor. FCH Architect/MEP <u>Suggested design stage evidence:</u> - Floor plans with marked up elements showing how the design can be changed - File note at Stages 2 and 4 showing which measures have been identified, and which measures were implemented/omitted
		11	7	9	10	Standard Waste Credit Total
		3	0	0	0	Exemplary Waste Credit Total
		11.36	5.32	6.84	7.60	% Waste Total (Standard + Exemplary)
Pollution						
Pol 01 - Impact of Refrigerants						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Impact of refrigerants	3	1	1	2	All systems (with electric compressors) must comply with the requirements of EN 378:2016 and EN 378-2:2016 and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice. MEP Credit 1 - Impact of refrigerant Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) of 1000 kgCO2e/kW cooling/heating capacity. Possible second credit if the (DELCO2e) of 100 kgCO2e/kW cooling/heating capacity or refrigerant is <10GWP. MEP Credit 2 - Leak detection(Possible) Where systems using refrigerants have a permanent automated refrigerant leak detection system installed; OR where an inbuilt automated diagnostic procedure for detecting leakage is installed. In all instances a robust and tested refrigerant leak detection system must be installed and must be capable of

						continuously monitoring for leaks. The system must be capable of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident. MEP Condensers will be present. Currently 410a specified with a preference to not include pump down as these typically have large CAPEX, and VRF units are expected to be too small for practical implementation. Potential for R32 refrigerant to be used, or hermetical sealed units to allow a second credit. <u>Suggested design stage evidence:</u> • MEP specification • DELC calculation • Refrigerant datasheet
Pol 02 - NOx emissions						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	NOx emission levels for heating and hot water	3	0	0	1	Not targeted for Scenario 1 and 2. Potential for Scenario 3. This credit uses traditional grid NOx factors within the BREEAM RFO 2014 scheme. As such, the specification of any heat pump makes the credit unlikely to be met. The requirement for low CO2 heat must take precedence over the now misaligned BREEAM NOx credit requirements. It is expected a heat pump is to be specified for heating and hot water, with a gas boiler booster for DWH. There is small potential for a credit to be achieved after undertaking a NOx calculation averaged across each system. MEP Where the plant installed to meet the buildings delivered heating and hot water demand has, under normal operating conditions, a NO_x emission level (measured on a dry basis at 0% excess O₂) as follows: • NO_xEmission levels for heating and hot water 40 mg/kWh

						<u>Suggested design stage evidence:</u> - Boiler/CHP/Heat Emitter/Cooling/Heater schedules - Drawings showing quantity of each item of heating/hot water/cooling equipment - Datasheets and/or manufacturer emails confirming NOx emissions for each piece of equipment OR Letter or calculation sheet calculating the NOx emissions for the development.
Pol 03 - Surface Water Run Off						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Flood resilience	2	1	2	2	A BREEAM compliant FRA (Flood Risk Assessment) has been undertaken that covers different sources of flooding such as fluvial, tidal, surface water, ground water, sewers and any artificial sources to be provided to determine risk zone of site. The content of the FRA should be based on historic trends but should also account for predicted changes to the climate which may impact on the flood risk to the site in the future. Prerequisite – a draft site flood risk assessment (FRA) has been carried out by JM Enviro Limited in July 2022. Flood resilience: An FRA report has been produced as part of the planning application. This early stage report shows some mitigation measures to ensure the site flood risk remains low. The main body of the report suggests an overall low flood risk. The design stage assessor is to confirm compliance with the drainage engineer and award credit as appropriate. <u>Suggested design stage evidence:</u> - Flood Risk Assessment report - Letter of confirmation

2	Surface water run-off	2	1	2	2	Assessor at design stage to check whether there is no change in impermeable surface. It is likely this credit can be achieved. A blue roof has been specified at this stage to contribute towards achieving a second credit and addressing run-off requirements at planning stage. This assessment was confirmed on 20th June. Two credits are targeted for Scenario 2 and 3. For two credits: 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. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place. Calculations include an allowance for climate change. <u>Suggested design stage evidence:</u> • Drainage report • Design drawings showing impermeable areas of the site draining to the watercourse for the pre- and post-development scenarios
3	Minimising watercourse pollution	1	0	1	1	Not targeted. Potential for Scenario 2 and Scenario 3. Calculations are carried out (59_631_Queen Victoria Street_Energy & Sustainability Statement_210205) to show that there will be no discharge from the developed site for rainwater depths of up to 5mm and (if necessary) measures will be implemented to prevent watercourse pollution. This needs to be confirmed again at a later design stage. <u>Suggested design stage evidence:</u> • Calculation of the 5mm rainfall event from the relevant areas • Calculation results for the pre and post refurbishment volume of run-off

						Calculation results for the pre and post refurbishment peak rate of run-off
e1	Exemplary performance - Surface water run-off	1	0	0	0	Credit not targeted as no discharge would be permitted during rainfall events.
Pol 04 - Reduction of Night-time Light Pollution						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Reduction of night-time light pollution	1	1	1	1	Any external lighting (except for safety and security lighting) shall be designed to be automatically switched off between 23:00 and 07:00. Safety and security lighting design shall comply with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. Any illuminated advertisements shall be designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements. MEP
Pol 05 - Noise Attenuation						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Reduction of noise pollution	1	1	1	1	KP Acoustics have been appointed. A BS7445 noise impact assessment has been carried out by the SQA to determine existing background noise at the nearest or most exposed development to the proposed site or a location where background conditions are similar, and the rating noise level resulting from the new source. At this stage, the planning requirement can be met. However, the plant specification is still subject to change, and the credit is to be awarded during the design stage after the plant schedule and any attenuation is finalised. <u>Suggested design stage evidence:</u> SQA CV
		13	5	8	10	Standard Pollution Credit Total
		1	0	0	0	Exemplary Pollution Credit Total

		13.09	4.65	7.44	9.30	% Pollution Total (Standard + Exemplary)
Innovation						
AI - Approved Innovation						
	Credit	Available	Scenario 1	Scenario 2	Scenario 3	Comments
1	Innovation application approved by BRE Global	1	0	0	0	
		0	0	0	0	Standard Innovation Credit Total
		1	0	0	0	Exemplary Innovation Credit Total
		1	0	0	0	% Innovation Total (Standard + Exemplary)

Appendix C – Energy performance data for the proposed building at every improvement step

New build

	Total gas consumption in kWh/m ²	Total regulated Electricity consumption in kWh/m ²	Total energy	Carbon in kg CO ₂ /m ²		Total Carbon in tons	
				Part L	SAP 10.2	Part L	SAP 10.2
Building before passive design	241.9	18.7	248.8	61.9	53.3	59.1	50.9
Building after passive design	231.0	18.7	238.5	59.6	51.1	56.9	48.8
Building after active design	229.6	10.7	229.5	55.2	49.7	52.7	47.4
Building after VRF and HP	38.6	79.5	112.8	49.6	18.9	47.4	18.1
Building after PV	38.6	50.7	85.3	34.3	15.0	32.8	14.3

Refurbishment/Extensions

	Total gas consumption in kWh/m ²	Total regulated Electricity consumption in kWh/m ²	Total energy	Carbon in kg CO ₂ /m ²		Total Carbon in tons	
				Part L	SAP 10.2	Part L	SAP 10.2
Building before passive design	237.4	30.6	553.9	67.2	54.0	138.8	111.6
Building after passive design	232.1	30.8	543.4	66.1	52.9	136.7	109.4
Building after active design	230.9	19.5	517.5	60.0	51.1	124.0	105.7
Building after VRF and HP	38.6	78.0	241.0	48.8	18.7	100.9	38.7

Appendix D – Excerpts from BRUKL document

BRUKL Output Document

 HM Government

Compliance with England Building Regulations Part L 2013

Project name

QVS 1 New build Green

As designed

Date: Tue Jul 05 11:03:21 2022

Administrative information

Building Details

Address: 1-15 Queen Victoria Street & 145-148 Friar Street, Reading, RG1 1SY

Certification tool

Calculation engine: Apache
Calculation engine version: 7.0.15
Interface to calculation engine: IES Virtual Environment
Interface to calculation engine version: 7.0.15
BRUKL compliance check version: v5.6.b.0

Certifier details

Name: TBA
Telephone number: Phone
Address: 3 Park Place, Cardiff, CF10 3DP

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	54.2
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	54.2
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	33.4
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 _{Limit}	U _{Calc}	U _{Calc}	Surface where the maximum value occurs*
Wall**	0.35	0.15	0.15	02000007:Surf[2]
Floor	0.25	-	-	UNKNOWN
Roof	0.25	0.1	0.1	03000008:Surf[0]
Windows*** roof windows, and rooflights	2.2	1.3	1.3	02000007:Surf[0]
Personnel doors	2.2	-	-	No Personnel doors in building
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_{Limit} = Limiting area-weighted average U-values [W/(m²K)]

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

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

* 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

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Energy Consumption by End Use [kWh/m ²]		
	Actual	Notional
Heating	7.64	23.21
Cooling	0.45	1.7
Auxiliary	5.81	4.03
Lighting	4.26	8.58
Hot water	100	96.99
Equipment*	9.3	9.3
TOTAL**	118.16	134.51

* 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/m ²]		
	Actual	Notional
Photovoltaic systems	28.79	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO ₂ Emissions Summary		
	Actual	Notional
Heating + cooling demand [MJ/m ²]	68.74	180
Primary energy* [kWh/m ²]	283.31	315.35
Total emissions [kg/m ²]	33.4	54.2

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

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