

17 Charterhouse Street, London

## **BREEAM Review**

### **Interim (Design stage) – Shell & Core**

On behalf of: Anglo American and De Beers

March 2018

## DOCUMENT CONTROL

Version	Date	Author	Checked by	Status
1.0	6 March 2018	H Mustafa	M Cotton	Final – for issue

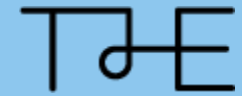
Project reference: TE0245

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# 1. INTRODUCTION

The purpose of this report is to provide review of the BREEAM strategy for the proposed redevelopment of 17 Charterhouse Street, in support of the Section 106 issued by London Borough of Camden (LBoC) in relation to the planning application (ref. 2017/4586/P).

The LBoC have included a requirement for the completion of an '**Energy Efficiency and Renewable Energy and Sustainability Plan**'. The purpose of the plan is to provide a review of the current proposed design against the targets and commitments set out within the planning submission documentation, namely the following key documents:

- Energy Statement for 17 Charterhouse Street (24th November 2017 by Twin and Earth)
- Sustainability Statement for 17 Charterhouse Street (24 November 2017 by Twin and Earth)

As part of the completion of the 'Energy Efficiency and Renewable Energy Sustainability Plan' and as referenced within the Section 106 agreement, it is necessary to demonstrate adherence with the following clause (2.43 (a)):

*"include a design stage Building Research Establishment Environmental Assessment Method (BREEAM) review report completed by a licensed BREEAM assessor in respect of the Property with a target of achieving a **Excellent rating** and attaining at least **86% of the credits in Energy, 100% Water and 46% of the credits in the Materials categories**;"*

The intention of this short report is to provide a summary of the BREEAM performance against the BREEAM credits targeted within the BREEAM Pre-Assessment Report included within the Sustainability Statement dated 24<sup>th</sup> November 2017. Whilst the requirement is to effectively provide a copy of the BREEAM design (interim) certification and report in support of validating the design against the planning submission targets, it is not technically feasible

to do so for the based on the procurement route (see section '2 Limitations' for further details).

The report will therefore focus on validating the credits relating to the Shell & Core works which have been procured under a separate contract from the fit-out works, which are scheduled to be released for tender in approximately July 2018. Where possible, further details have been provided in relation to the proposed strategy for demonstrating compliance during the fit-out design.

## 2. Limitations

Whilst it is appreciated that the agreement requires submission of a "design stage BREEAM review report" – which is translated into the "Design stage (Interim) Certification" – it must be clearly stated that submission of the design (interim) certificate at the present time is **not technically feasible**.

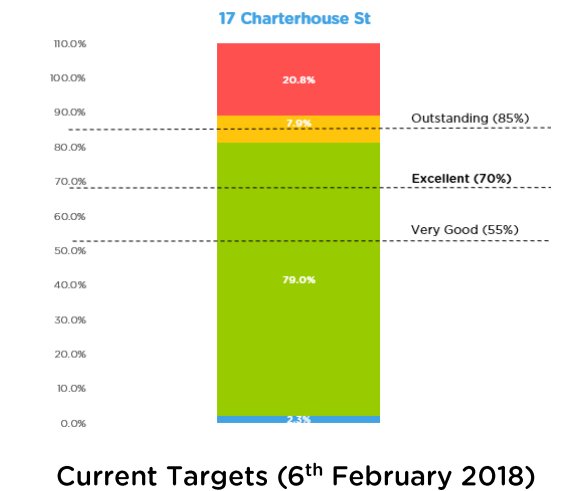
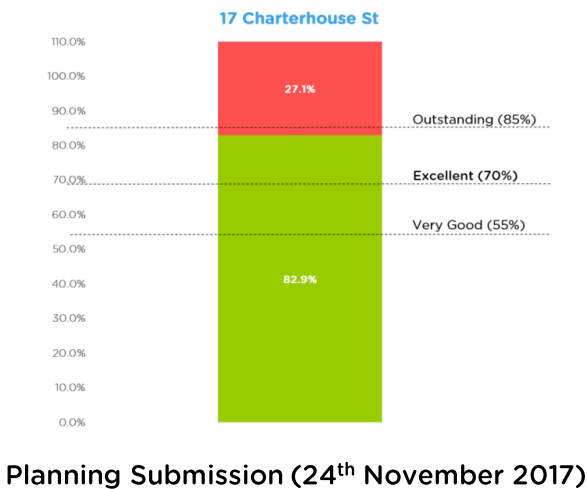
The original programme for 17 Charterhouse Street included a clear demarcation of separation between the 'Shell & Core' and 'Fit-Out' design and contract. The Shell & Core design development is scheduled to run up until the end of March 2018, with the Fit-Out design continuing until the end of June 2018. The majority of key tender packages for the Shell & Core works have been finalised and reviewed by the BREEAM Assessors, Twin&Earth, to ensure compliance.

Subsequently, Twin&Earth have undertaken a review of the shell & core design; however in the majority of instances the credits cannot be fully closed until completion of the fit-out design.

Clarification has been provided by Twin&Earth to LBoC in relation to the above limitations (see Mr Matt Cotton email dated 21<sup>st</sup> February 2018).

### 3. Summary of Results

The following provides a summary of results comparing the BREEAM performance at the planning stage against the current status of design.



- Targeted:** credits which are deemed achievable at this stage.
- Unobtainable:** credits which cannot be achieved due to site or design constraints.
- Potential:** credits which are potential but subject to further design development, as well as technical and cost feasibility.
- Closed:** credits which are closed based on sufficient information.

The current targeted score is 81.3% which whilst slightly below the target submitted to planning, still represents a significantly higher performance above the required target of Excellent (70%).

Significant improvement in the overall Ene 01 Reduction in CO<sub>2</sub> Emissions performance results in a current score of 15 out of 15 credits. Achieving exemplary performance in Wat 01 Water Consumption, with an Innovation credit being achieved is equivalent to a further 1%.

The following un-weighted scores have been achieved at this stage of design for the proposed development in line with Camden Policy:

	Camden Policy target	Planning Submission (24 <sup>th</sup> November 2017)	Current Performance (6 <sup>th</sup> February 2018). Targeted plus closed credits	Current Performance (6 <sup>th</sup> February 2018). Targeted, closed and potential credits
Energy	60%	86%	77%	96%
Water	60%	100%	100%	100%
Materials	40%	46%	46%	62%

Table 1. Summary of performance against BREEAM categories in line with Camden policy

The table above demonstrates that the minimum un-weighted scores within all categories is still being achieved by the current design, inclusive of the shell & core proposals.

All Minimum Standards to achieve BREEAM Excellent remain targeted.

### **3.1 BREEAM Credits Review**

A summary of the performance of the current design against the BREEAM credits has been provided in Appendix A, providing details of where compliance has been demonstrated for the 'components' relating to the Shell & Core, with further details provided as to what is forthcoming for the fit-out design.

## APPENDIX A: BREEAM PERFORMANCE REVIEW

BREEAM DESIGN STAGE ASSESSMENT RESULTS

Project 2020  
BREEAM 2014 Bespoke (NDRFO-NC) Offices  
06.03.2018

Key  
Av = Available  
T=Targeted  
P=Potential  
U=Unobtainable  
C=Closed  
Minimum Requirements

AvMANAGEMENT - RequirementsC T P UCamden Interim Review 6th February 2018

MAN 01 - Project Brief and Design	1	<b>One credit-Stakeholder consultation (project delivery)</b> 1. Project delivery stakeholders meet no later than RIBA Stage 2 to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery. 2. Defining the roles and responsibilities for each key phase of the project, including (but not limited to): end user requirements, occupiers budget and technical expertise in maintaining any proposed systems, maintainability and adaptability requirements for training and aftercare support. 3. Demonstrate how the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.  A clear sustainability brief is developed prior to Concept Design which sets out: a. Client requirements e.g. internal environmental conditions required b. Sustainability objectives and targets including target BREEAM rating, business objectives etc. c. Timescales and budget d. List of consultees and professional appointments that may be required e.g. Suitably Qualified Acoustician etc. e. Constraints for the project e.g. technical, legal, physical, environmental.		1			BREEAM Project Brief has been developed and implemented for the shell & core works, with feedback received from all stakeholders. The project brief for the fit-out works is currently in development and will inform the fit-out design and sustainability targets.
	1	<b>One credit-Stakeholder consultation (third party)</b> Similar to the above, but with more onerous consultation content and undertaken by a third party (meaning someone not involved in the design). Consultation must be undertaken by Concept Design, feedback must be incorporated into the proposal and consultation feedback must be given to and received by, all relevant parties no later than detailed Design (RIBA Stage 4).		1			Consultation has successfully been delivered to all relevant third parties during the planning consultation process, with all feedback successfully documented and implemented. Further consultation to be delivered to occupants and facilities management as part of the fit-out concept designs.
	1	<b>One credit-Sustainability Champion (design)</b> 1. A Sustainability Champion (BREEAM AP) is appointed no later than RIBA Stage 1. 2. BREEAM Rating Target is set by the Sustainability champion and agreed by client and design team no later than RIBA Stage 2. 3. The targeted BREEAM rating is achieved.		1			Twin&Earth have been appointed as BREEAM AP. Further AP workshops are scheduled during the early stages of the fit-out design to ensure compliance.
	1	<b>One credit-Sustainability Champion (monitoring)</b> 1. The credit above is achieved. 2. The Sustainability Champion is appointed to monitor and report progress throughout the project. As a minimum must attend key project/design team meetings during the Concept Design, Developed Design and Technical Design stages and reporting during, and prior to, completion of each stage.		1			Twin&Earth have been appointed as BREEAM AP. Further AP workshops are scheduled during the detailed stages of the fit-out design to ensure compliance.
MAN 02 - Life cycle cost and service life planning	2	<b>Two credits-Elemental life cycle cost (LCC)</b> 1. An elemental life cycle cost (LCC) analysis has been carried out, at RIBA Stage 2 together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008. 2. The LCC analysis shows options for basic structure and envelope also covering multiple cash flow scenarios e.g. 20, 30, 50+ years; It must also include a fabric and servicing strategy for the project outlining services component and fit-out options (if applicable) over a 15-year period.		2			An Elemental Life cycle Costing exercise has been completed by the LCC Consultant with the design team and measures focused on reducing life cycle costings have been adopted within the shell and core design. Further decisions in relation to servicing arrangements for the fit-out works to be developed.
	1	<b>One credit-Component level LCC Plan</b> 1. A component level LCC plan has been developed by the end of RIBA Stage 4 in line with PD 156865:2008 and includes: Envelope, Services, Finishes and External spaces. 2. Demonstrate, how the LCC plan has influenced building and systems design/specification to minimise life cycle costs and maximise critical value.		1			An LCC Workshop and Study has been completed for component level, with the following areas considered. - LED lighting vs Improved LED - PV performance and payback options - Green roof options  Further options are to be considered during the fit-out.
	1	<b>One credit-Capital Cost Reporting</b> 1. Report the capital cost for the building in pounds per square metre (£k/ m2 ), via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section. Data will be treated as confidential and will only be used anonymously. Data for Design Stage compliance can be based on predicted capital cost, including contingencies.		1			The Capital Cost of the project will be reported following fit-out costings.
MAN 03 - Responsible construction practices		<b>Pre-requisite</b> All timber and timber based products used on the project is 'Legally harvested and traded timber'.					This is a minimum requirement and therefore the Contractor will be required to ensure that timber is legally sourced.
	1	<b>One credit-Environmental management</b> 1. The principal contractor operates an environmental management system (EMS) covering their main operations (ISO 14001/EMAS) or equivalent standard: or have a structure that is in compliance with BS 8555:2003 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system', and has completed phase audits one to four, as defined in BS 8555. 2. The principal contractor implements best practice on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG61.		1			The appointed Principal Contractor for the shell & core does hold an EMS. The Contractor for the fit-out works will also be required to hold such certification.
	1	<b>One credit-Sustainability Champion</b> 1. A Sustainability Champion (like the contractor's environmental manager) to monitor environmental performance and ensure implementation of relevant measures during the Construction, Handover and Close Out stages 2. Will ideally be site based or will visit the site regularly to carry out spot checks (and record evidence including photos), with the relevant authority to do so and require action to be taken to address shortcomings in compliance, which should be reported at relevant project team meetings. 3. The BREEAM target rating forms a requirement of the principal contractor's contract and the rating is achieved at PC.		1			Contractor will be contractually required to employ a Sustainability Champion during the construction phases in compliance with the credit requirements
	2	<b>Two credits-Considerate construction</b> 1. One credit: a CCS score between 25 and 34 with at least 5 points achieved per section. 2. Two credits: a CCS score between 35 and 39 with at least 7 points achieved per section. <b>1 credit minimum requirement for Excellent rating.</b> <b>2 credits minimum requirement for Outstanding rating.</b>		2			Contractor will be contractually required to register the project with CCS and achieve a CCS score of at least 40 with 7 points in each category.
		<b>EXEMPLARY CRITERIA - Considerate construction</b> A CCS score of 40 or more with at least 7 points achieved per section is achieved.		1			See above action.
	2	<b>Two credits-Monitoring of construction-site impacts</b> 1. One credit: monitoring of water and energy consumption. 2. Two credits: monitoring of transport of construction materials to site and waste from site.		2			Contractor will be contractually required to monitor energy, water and transport during the construction phases in line with the credit requirements.



MAN 04 - Commissioning and handover	1	<b>One credit-Commissioning and testing schedule and responsibilities</b> 1. Commissioning schedule covering commissioning and re-commissioning of building services and control systems and testing and inspecting building fabric. 2. The schedule will identify the appropriate standards such as current Building Regulations, BSRIA and CIBSE guidelines. Specific requirements apply to BMS commissioning. 3. An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, commissioning, testing and, where necessary, re-commissioning activities on behalf of the client. 4. The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and main programme of works.		1			Relevant commissioning requirements have been included within the Stage 4 GDM MEP Specification. Requirements are also to be included within the fit-out specifications.
	1	<b>One credit-Commissioning Building Services</b> 1. The above credit is achieved. 2. A specialist commissioning manager is appointed for complex building systems during the design stage (by either the client or the principal contractor) with responsibility for: - Undertaking design reviews and giving advice on suitability for ease of commissioning. - Providing commissioning management input to construction programming and during installation stages. - Management of commissioning, performance testing and handover/post-handover stages.		1			A commissioning agent has been appointed for the shell & core, however their review will also be required to cover the fit-out proposals.
	1	<b>One credit-Testing and inspection building fabric</b>  1. The commissioning and testing schedule and responsibilities credit is achieved. 2. Projects where the fabric of the building is being upgraded*, the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths is quality assured through completion of a thermographic survey as well as airtightness testing and visual inspection at appropriate times during the refurbishment. A thermographic survey as well as an airtightness test and inspection is undertaken by a Suitably Qualified Professional in accordance with the appropriate standard. The survey must be of 100% of all treated spaces within the assessment zone. 3. Any defects identified are rectified prior to building handover and close out.  *For the purposes of this Bespoke project, the BRE have confirmed that the Criteria 7-8 is not applicable to any areas where the external facades will not be upgraded i.e. Saffron Hill 2003 Extension.			1		Credit currently under review to determine the risk associated with targeting this credit.
	1	<b>One credit-Handover</b> 1. A Building User Guide (BUG) is developed <b>This is a minimum requirement for Excellent and Outstanding ratings.</b> 2. A training schedule is prepared for building occupiers/premises managers, timed appropriately around handover and proposed occupation plans, which includes the following content as a minimum: - The building's design intent - The available aftercare provision and aftercare team main contact(s), including any scheduled seasonal commissioning and post occupancy evaluation - Introduction to, and demonstration of, installed systems and key features, particularly building management systems, controls and their interfaces - Introduction to the Building User Guide and other relevant building documentation, e.g. design data, technical guides, maintenance strategy, operations and maintenance (O&M) manual, commissioning records, log book etc. - Maintenance requirements, including any maintenance contracts and regimes in place.		1			The Principal contractor will be required to deliver a programme of training and handover upon completion of the shell & core works, including delivery of a BUG. Further to this the Principal Contractor is required to implement the same for the fit-out.
MAN 05 - Aftercare	1	<b>One credit-Aftercare support</b> 1.The following will be provided: - A meeting between the aftercare team/individual and the building occupier/management (prior to initial occupation, or as soon as possible thereafter) to introduce the aftercare team and support (BUG and training schedule/content) AND Present key information about the building to ensure it operates as efficiently and effectively as possible. - On-site facilities management training. - Aftercare support for at least the first month of building occupation - on-site attendance on a weekly basis (flexible) to support building users and management. - Aftercare support provision for occupants for at least the first 12 months from occupation (helpline, nominated individual, etc.). 2. Collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is occupied.		1			Anglo American and De Beers have committed to undertake aftercare for a minimum of three years.
	1	<b>One credit-Seasonal commissioning</b> Seasonal commissioning activities will be completed over a minimum 12-month period, once the building becomes substantially occupied (building services testing, interview with occupants ,etc.). The seasonal commissioning must be carried out by the Specialist Commissioning Manager. <b>This is a minimum requirement for Excellent and Outstanding ratings.</b>		1			GDM Stage 4 MEP Specification for the shell and core includes a requirement to undertake seasonal commissioning. Requirements will also be required to apply for the fit-out specification.
	1	<b>One credit-Post occupancy evaluation (POE)</b> 1. A POE is undertaken by the client or building occupant one year after initial building occupation. The POE can be carried out by a team member if evidence is provided that robustly demonstrates the independence of the consultation process. 2. Post occupancy performance information is disseminated internally and externally via case study publicly available (website, publicly available literature, press release etc.) unless confidentiality issues are demonstrated, in which case internal distribution only would be accepted.			1		MCM Workplace team will be commissioning to undertake post-occupancy evaluation.
		<b>EXEMPLARY CRITERIA</b> Provision of the following at quarterly intervals for the first three years of building occupation: - Collection and analysis of occupant satisfaction, energy consumption and water consumption data. - Setting targets for reducing water and energy consumption and monitor progress towards these. - Feedback any 'lessons learned' to the design team and developer. - Provision of the actual annual building energy, water consumption and occupant satisfaction data to BRE.		1			Anglo American and De Beers have committed to undertake aftercare for a minimum of three years.

Av HEALTH & WELLBEING - Requirements

C T P U

Comments

HEA 01 - Visual Comfort	1	<b>One credit-Glare control</b> 1. Designing out glare out of all relevant building areas (workstations, projector screens etc.) through building form and layout and/or building design measures. Measures include: low eaves, occupant controlled blinds - transmittance value is < 0.1 (10%), external shading. 2. The strategy must avoid increasing lighting energy consumption, by taking daylight access into consideration and ensuring that the use or location of shading does not conflict with the operation of lighting control systems.		1			The proposed strategy for glare control consists of blinds, which are to be included within the fit-out specification.
	3	<b>Up to three credits - Daylighting (Refurbishment)</b> Up to <b>three</b> credits are awarded on a sliding scale depending on the percentage of relevant building areas that comply with one of the following daylighting criteria: a. The relevant building areas meet good practice daylight factor(s) and other criterion as outlined in Table 12 and Table 13 : OR b. When 80% of the occupied areas achieve an Average Daylight Factor (ADF) ≥2% AND one of the following: A uniformity ratio of at least 0.3 or a minimum point daylight factor of at least 0.3 times the above ADF. Glazed roofs, such as atria, must achieve a uniformity ratio of at least 0.7 or a minimum point daylight factor of at least 0.7 times the ADF. <b>Two credits</b> 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: a. 5% glass to floor area ratio for side windows; OR b. 2.5% glass to floor area ratio for roof lights; <b>One credit</b> where daylighting provision, averaged over all relevant spaces, has improved after refurbishment or fit-out by 15% or more, including a or b above. <b>Upto 2 credits-Daylighting (New build)</b> ROUTE 1 <b>One credit</b> When 60% of the occupied areas achieve an Average Daylight Factor (ADF) ≥2% <b>Two Credits</b> When 80% of the occupied areas achieve an Average Daylight Factor (ADF) ≥2% AND one of the following: A uniformity ratio of at least 0.3 or a minimum point daylight factor of at least 0.3 times the above ADF. Glazed roofs, such as atria, must achieve a uniformity ratio of at least 0.7 or a minimum point daylight factor of at least 0.7 times the ADF. OR ROUTE 2 When 80% of the other occupied areas achieve an average daylight illuminance of a least 300 lux for 2000 hours per year and a minimum daylight illuminance at worst lit point of at least 90 lux for 2000 hours per year.		2	1	Daylighting remains as a potential subject to sample modelling, with further details being required from the fit-out layouts and specification.	
		<b>EXEMPLARY CRITERIA-Daylighting</b> One additional credit can be achieved for meeting the Exemplary Performance daylight levels established by BREEAM.				1	Credit requirements for Exemplary Performance are onerous and therefore compliance has been deemed unobtainable at this stage.
	2	<b>Upto Two credits-View out</b> 1. <b>One credit</b> where <b>80%</b> of the floor area in <b>each</b> relevant building areas (areas with workstations/benches or where close work will be undertaken or visual aids will be used) is within 7m of a wall with an adequate view out. OR 2. <b>Two credits</b> where <b>95%</b> of the floor area in <b>each</b> relevant building areas (areas with workstations/benches or where close work will be undertaken or visual aids will be used) is within 7m of a wall with an adequate view out. 3. The window/opening is ≥ 20% of the surrounding wall area. Where the room depth >7m, compliance is only possible where the %window/opening ≥ values in table 1.0 of BS 8206.			1	1	Achievability of this credit is subject to the fit-out layouts.
	1	<b>One credit-Internal and external lighting levels, zoning and control</b> <b>INTERNAL LIGHTING</b> - All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts. - Illuminance levels in accordance with the SLL Code for Lighting 2012 and any other relevant industry standard. - Compliance with CIBSE LG7 for areas where computer screens are regularly used <b>EXTERNAL LIGHTING</b> Must be specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places. <b>ZONING AND OCCUPANT CONTROL</b> - Independent occupant control of areas including -but not limited to-: office zones of no more than four workplaces, workstations adjacent to windows/atria, presentation and audience areas in seminar and lecture rooms, zoning of seating areas, circulation space and lectern area in auditoria, servery and seating/dining areas in dining restaurant and café areas, bar and seating areas in bar areas.		1			The GDM MEP Specification for the shell and core has been designed in compliance with the relevant lighting codes, with occupant control provided for workstations of four. Further detailed design for lighting to be developed around the fit-out specification.
	1	<b>One credit-Indoor air quality (IAQ) plan</b> An indoor air quality plan has been produced which considers: a. Removal of contaminant sources b. Dilution and control of contaminant sources c. Procedures for pre-occupancy flush out d. Protection of Heating Ventilation and Air Conditioning (HVAC) systems from sources of pollution during refurbishment/fit-out works e.g. dust e. Procedures for protecting the indoor air quality of areas outside of the refurbishment or fit-out zone that may be affected by the refurbishment/fit-out works f. Procedures for identifying and implementing third party testing and analysis required to ascertain that the contaminant sources have been removed effectively before occupancy g. Commitments for maintaining indoor air quality in-use, e.g. maintenance and cleaning of the HVAC system, ductwork and filters.		1			RSK have been commissioned to develop an indoor air quality plan covering the shell & core and fit-out works.

HEA 02 - Indoor air quality	1	<b>One credit-Ventilation</b> 1. Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation. 2. The building's air intakes and exhausts are over 10m apart and intakes are over 20m from sources of external pollution (unless relative position is designed in accordance with BS EN 13779:2007 Annex A2). 3. In naturally ventilated buildings/spaces: openable windows/ventilators are over 10m from sources of external pollution. 4. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3.  Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO2) or air quality sensors specified and: a. In mechanically ventilated buildings/spaces: sensor(s) are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space. b. In naturally ventilated buildings/spaces: sensors either have the ability to alert the building owner or manager when CO2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows/roof vents.		1			The GDM shell and core MEP specification and design demonstrates that the ventilation strategy for the shell and core is compliant. Further detailed design for local ventilation control including CO2 sensors for areas with large and unpredictable occupancy to be developed.
	1	<b>One credit-Volatile organic compound (VOC) emission levels (products)</b>				1	Credit not sought.
	1	<b>One credit-Volatile organic compound (VOC) emission levels (post construction)</b> 1. Formaldehyde and total volatile organic compound (TVOC) concentration level are measured post construction (but pre-occupancy) and comply with BREEAM maximum levels. 2. If levels are not met, the project team confirms the measures that have, or will be taken, in accordance with the IAQ plan, to reduce the levels to within these limits.		1			Post-construction VOCs testing can only be committed to contractually once the fit-out tender is released.
		<b>EXEMPLARY CRITERIA - VOC</b> <b>One credit</b> 1. All seven product categories meet the testing requirements and emission levels criteria. 2. Tested product formaldehyde emission levels are ≥ 0.06mg/m3 air. Two credits 1. As above plus tested product formaldehyde emission levels are ≥ 0.01mg/m3 air.				2	Credit not sought.
	1	<b>One credit-Adaptability - Potential for natural ventilation</b> 1. Room depths are designed in accordance with CIBSE AM10 (section 2.4) and the openable window area in each occupied space is equivalent to 5% of the gross internal floor area of that room/floor plate. OR Cross ventilation is demonstrated via CIBSE AM10 design tools. For a strategy which does not rely on openable windows, or which has occupied spaces with a plan depth greater than 15m, the design must demonstrate (in accordance with criterion 13.a.i. above) that the ventilation strategy can provide adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates. 2. The natural ventilation strategy is capable of providing at least two levels of user-control on the supply of fresh air.				1	Credit not sought.
HEA 04 - Thermal comfort	1	<b>One credit-Thermal modelling</b> 1. Thermal modelling is carried out using CIBSE AM11 compliant software. 2. The modelling demonstrates compliance with CIBSE Guide A summer and winter operative temperatures for A/C buildings or compliance with CIBSE Guide A winter temperature and compliance with CIBSE TM52 for summer temperatures. 3. For air conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.		1			Twin&Earth have been commissioned to undertake thermal comfort modelling although this will only be feasible once the fit-out design and layouts have been determined.
	1	<b>One credit-Adaptability - for a projected climate change scenario</b> 1. The above credit is achieved. 2.The thermal modelling demonstrates compliance with the requirements of the thermal comfort credit for a projected climate change environment. 3. Where criteria 2 is not met, the project team demonstrates how the building has been adapted, or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements . 4. For air conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.		1			Twin&Earth have been commissioned to undertake thermal comfort modelling although this will only be feasible once the fit-out design and layouts have been determined.
	1	<b>One credit-Thermal zoning and controls</b> 1. The thermal comfort credit is achieved. 2. The thermal modelling analysis has informed the temperature control strategy for the building and its users. 3. The strategy for proposed heating/cooling system(s) has addressed the following: - Zones within the building and how the building services could efficiently and appropriately heat or cool these areas (for example different requirements for the central and perimeter areas). - Degree of occupant control (based on discussions with the end user or alternatively design guidance, case studies, feedback) considers: User knowledge of building services, Occupancy type, patterns and room functions, How the user is likely to operate or interact with the system(s), The user expectations and degree of individual control, How the proposed systems will interact with each other and how this may affect the thermal comfort of the building occupants and The need or otherwise for an accessible building user actuated manual override for any automatic systems.		1			Twin&Earth have been commissioned to undertake thermal comfort modelling although this will only be feasible once the fit-out design and layouts have been determined. Zoning and controllability based on the fit-out will be determined once the specification is known.
HEA 05 - Acoustic performance	3	<b>Acoustic Performance - 3 credits</b> A suitable qualified acoustician is appointed during the design stages to develop an acoustic strategy in line with the BREEAM requirements. A programme of pre-completion acoustic testing is undertaken to confirm the acoustic levels, and where necessary, remediation is undertaken. <b>One credit-Sound Insulation</b> The sound insulation between acoustically sensitive rooms and other occupied areas complies with the performance criteria given in Section 7 of BS 8233:2014 - summary of key limits below. Pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures established by BREEAM. <b>One credit-Internal indoor ambient noise levels</b> Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014. A programme of acoustic measurements is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures established by BREEAM. <b>One credit-Reverberation</b> Achieve reverberation times compliant with Section 2 of APS. In addition, or alternatively, if relevant to the assessed building: classrooms, seminar rooms and lecture theatres achieve reverberation times compliant with section 2 of APS.		3			Sandy Brown have developed a Stage 3 Acoustic Report which fully addresses the acoustic principles of BS 8233 for indoor ambient noise, sound insulation and reverberation. This includes the shell & core and full fit-out requirements. Further Acoustic Report will be developed to validate the fit-out proposals.
HEA 06 - Safety and Security	1	<b>One credit-Security of site and building</b> 1. A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) and develops a set of recommendations no later than RIBA Stage 2. 2. The recommendations are implemented.		1			A security consultant has undertaken a security needs assessment including a series of recommendations. The fit-out specification will include some of the security measures relating to operational infrastructure to uphold security.

Av

ENERGY - Requirements

C T P U

Comments

ENE O1 - Reduction of energy use and carbon emissions	15	<b>Up to 15 credits</b> achieved depending on the energy performance of the building. <b>5 credits minimum requirement for Excellent rating.</b> <b>8 credits minimum requirement for Outstanding rating.</b>		15			Twin and Earth have completed energy modelling which confirms that 15 out of 15 credits are achieved by adopting CN6 for the extension areas as per the Bespoke Appendix Approach. The modelling is subject to inputs of the fit-out including any further cooling required for SER and MER rooms.
		<b>EXEMPLARY CRITERIA</b> <b>Up to four credits - Zero regulated carbon</b> An equivalent percentage of the building's modelled 'regulated' operational energy consumption, is generated by carbon neutral on-site or near-site sources and used to meet energy demand from 'unregulated' building systems or processes. <b>Five credits - Carbon negative</b> The building is 'carbon negative' in terms of its total modelled operational energy consumption, including regulated and unregulated energy.				5	Innovation credits are not considered feasible unless all credits in Ene O1 have been achieved.
ENE O2 - Energy monitoring	2	<b>One credit-Sub-metering of major energy consuming systems</b> 1.Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel. 2. Buildings with a total useful floor area > 1,000m2 are metered using an appropriate energy monitoring and management system (BMS or equivalent). 3. The end energy consuming uses are identifiable to the building users (labelling or data outputs).  The BMS specifications must include the following requirements:  The system should meet the definition of an AM&T (automatic monitoring and targeting), as required for any product to be included on the Energy Technology List :  a) One or more meters or transducers that measure energy use for metering purposes. b) Some means of automatically capturing, retrieving & storing energy metering data electronically, for example: Automatic Metering Reading (AMR) equipment. c) Software that enables the analysis of energy metering data and the key factors that influence energy use, and the production of reports on energy consumption.  <b>This credit is a minimum requirement for Very Good, Excellent and Outstanding rating.</b>  <b>One credit - Sub-metering of high energy load and tenancy areas</b> 5. An accessible energy monitoring and management system or separate accessible energy sub-meters with pulsed or other open protocol communication outputs to enable future connection to an energy monitoring and management system are provided, covering a significant majority of the energy supply to tenanted areas or, in the case of single occupancy buildings, relevant function areas or departments within the building/unit.  1. Office areas (metering by floor plate) 2. Catering 3. Gym		2			GDM MEP Specification for the shell and core includes for full submetering compliance via a BMS. Submetering extends to the following: a. Space heating b. Domestic hot water heating - Toilets hot water (POU) c. Humidification* d. Cooling* e. Ventilation, i.e. fans (major)* f. Pumps g. Lighting h. Small power i. Renewable or low carbon systems (separately) - ASHP + PV j. Controls k. Other major energy consuming systems/plant, where appropriate.: Kitchen, Gym, Restaurant, lifts  Submetering is also split by floor for all systems, as well as separate metering for catering areas. Further submetering will need to be provided for the fit-out in relation to high energy load areas, e.g. catering and restaurant.
ENE O3 - Ext. lighting	1	<b>One credit-External lighting</b> The average initial luminous efficacy of the external light fittings is > 60 luminaire lumens per circuit Watt. All external light fittings are automatically controlled (timer or photocell).		1			An external lighting consultant has been appointed with responsibility of ensuring compliance with the BREEAM requirements.
ENE O4 - Low carbon design	1	<b>One credit-Passive design analysis</b> 1. The thermal comfort credit has been achieved. 2. A passive design analysis is undertaken no later than RIBA Stage 2 or equivalent) 3. total heating, cooling, mechanical ventilation and lighting load reductions result on at least 5% of overall building energy demand and/or CO2 emissions savings.		1			Twin & Earth have undertaken a passive design analysis during Stage 2 which considers: Site location, Site weather, Microclimate, Building layout, Building orientation, Building form, Building fabric etc. The primary passive measure is Shading which itself contributes to 7.6% energy reduction, equivalent to 10.1% carbon reduction against Part L.  NOTE: To achieve this credit, a thermal comfort study must be carried out and the thermal comfort criteria achieved (Hea O4) which is subject to the fit-out design.
	1	<b>One credit-Free cooling</b> 1. The above credit has been achieved. 2. The passive design analysis reviews opportunities for the implementation of free cooling solutions. 3. Free cooling is provided. Free cooling includes: Night time cooling, Ground coupled air cooling, Displacement ventilation, Ground water cooling, Surface water cooling, Evaporative cooling, direct or indirect, Desiccant dehumidification and evaporative cooling using waste heat, Absorption cooling using waste heat and natural ventilation.				1	Credit not sought.
	1	<b>One credit-Low zero carbon feasibility study</b> 1. A feasibility study is carried out by an energy specialist no later than RIBA Stage 2. 2. LZC technologies are specified in line with the recommendations of the report and result on at least 5% of overall building energy demand and/or CO2 emissions savings.		1			Twin & Earth have been appointed to undertake the LZC feasibility for the scheme which considers a range of LZC technologies and includes an LCA of the most feasible technology. The current energy strategy incorporates ASHP and PV which should contribute to at least 5% reduction in energy as required by BREEAM. This proposed strategy has been included within the GDM MEP Specification, although the PV is currently part of an on-going design development.
ENE O6 - Energy efficient transportation systems	1	<b>One credit-Energy consumption</b> 1. An analysis of the transportation demand and usage patterns for the building has been carried out to determine the optimum number and size of lifts, escalators and/or moving walks. 2. The energy consumption has been calculated in accordance with BS EN ISO 25745 for one of the following: At least two types of system, An arrangement of systems or A system strategy which is 'fit for purpose'. 3. Regenerative drives are specified where they save more energy than the additional standby energy used to support the drives (usually for high travel and high intensity use). 4. The transportation system with the lowest energy consumption is specified.			1		The Lift Consultancy confirmed that all requirements were technically feasible subject to confirmation of upgrade to the Diamond Lift and Vehicle Lift. The credit remains as potential until a costing decision has been made.
	2	<b>Two credits-Energy efficient features</b> 1. The first credit is achieved. For each newly specified lift, the following three energy efficient features are specified and for existing lifts, at least two of the following energy efficient features are specified: 2. Standby condition during off-peak periods, energy efficient lift car lighting and display lighting (> 55 lamp lumens/circuit Watt) and variable speed, variable-voltage, and variable-frequency (VVVF) controllers are specified. 3. Regenerative drives are specified is demonstrated to save energy. NOTE: other criteria apply to escalators which must be considered if specified.			2		
ENE 8 - Energy efficient equipment	2	<b>Two credits-Energy efficient equipment</b> 1. Identify which of the following is the highest unregulated building energy demand: Small power & plug-in equipment, Swimming pool, Communal laundry facilities with commercial sized appliances, Data centres, IT-intensive operating areas, Residential areas with domestic scale appliances (individual and communal facilities), Healthcare and Kitchen and catering facilities. 2. Specify the energy efficiency measures established by BREEAM for that energy consumption and achieve a meaningful reduction.  Small Power & Plug-In Equipment The following equipment has been awarded an Energy Star rating OR has been procured in accordance with the Government Buying Standards: 1. Office equipment 2. Other small powered equipment 3. Supplementary electric heating.  Data Centre (SER and MER) 1. Design is in accordance with the 'Best practices for the EU Code of Conduct on Data Centres' principles with the data centre achieving at least the 'Expected minimum practice' level (as defined in the Code of Conduct). 2. Temperature set points are not less than 24°C, as measured at the inlet of the equipment in the rack.  Kitchen and Catering The project has incorporated at least two-thirds of the energy efficiency measures outlined in the section summaries of each of the following sections of CIBSE Guide TM50			2		Potential credit subject to review of the catering consultant and IT Procurement.



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TRANSPORT - Requirements

C T P U

Comments

TRA 01 - Public transport accessibility	5	<p><b>Up to three credits- Accessibility to public transport</b> Achieved depending on the Accessibility Index of the site.</p> <p><b>Upto two credits - Alternative Measures</b> One credit is achieved where 2 alternative transport measures are achieved Two credits are achieved where 4 alternative transport measures are achieved</p> <p><b>Alternative Measures:</b> B - Where two credits under BREEAM issue Tra O3 have been achieved and the number of compliant cycle storage spaces provided is 10% greater than is required within 'TraO3 Cyclist facilities', thus providing extra capacity for future growth and allowing more building users to cycle as a result. C - Where two credits under BREEAM issue Tra O3 have been achieved and three or more types of compliant cycle facilities that are required within Tra O3 Cyclist facilities are to be provided, which includes the following facilities: showers, changing facilities, lockers and drying spaces. D - Where at least 5% of the car parking spaces provided for the building users include electrical charging points, with a minimum of two spaces being provided. F - Where the building has digital information points providing details on alternative transport options; this could include bus times, car sharing and cycle routes. These information points must be well positioned and accessible to all building users G - Where on-site facilities have been provided that reduce the need to travel (taking into account the activities being undertaken in the building), for example the specification of video conferencing systems or where the appropriate amenities are available on-site. A - Dedicated Bus Service E - Where priority spaces for car sharers are provided for at least 5% of the total car parking capacity for the building, with a minimum of two spaces being provided. H - Where negotiations with local bus companies have resulted in an increase of the local service provision in the building's local area that results in improving the existing Accessibility Index (AI) for the building by at least one point. I - Where another alternative measure has been implemented that is not listed above, which has been approved by BRE Global. Any additional approved measures will be listed on the assessor FAQs and added to this list over time as and when BRE Global re-issue the technical manual.</p>		5			Whilst the site has a high accessibility index, this credit also required the specification of IT infrastructure within meeting rooms, and live digital display for transport within communal areas. This is subject to the fit-out specification.
TRA 02 - Proximity to amenities	1	<p><b>One credit-Proximity to amenities</b> The following amenities must be found within 500m of the building entrance: At least 2 of the following: food outlet, access to cash, access to a recreation/leisure facility for fitness/sports At least one of the following: access to an outdoor open space, publicly available postal facility, community facility, pharmacy, GP and child care facility or school.</p>	1				The credit is closed based on the sites accessibility to local amenities.
TRA 03 - Cyclist facilities	1	<p><b>One credit-Cycle store</b> Compliant, safe, covered and accessible cycle storage will be provided with a minimum of 1 cycle space per 10 building users.</p> <p>The following sliding scale of compliance can be adopted: 1. For buildings with more than 200 users but less than 300, the unit of measure can be increased by a ratio of 1.5. 2. For buildings with more than 300 users but less than 400, the unit of measure can be increased by a ratio of 2. 3. For buildings with more than 400 users, the unit of measure can be increased by a ratio of 2.5.</p> <p>For sites where at least 50% of the available BREEAM credits for Public transport accessibility (Tra 01) have been awarded (rounded to the nearest whole credit), the number of compliant cycle spaces required in Table - 1 can be reduced by 50%.</p>		1			Cycle storage space has been suitably allocated within the shell and core works however the fit-out of the space is still to be developed.
	1	<p><b>One credit-Cyclist facilities</b> At least two of the following types of compliant cyclist facilities are provided - Showers - 1 per 10 cycle racks - Changing facilities (Toilet/shower cubicles cannot be counted as changing facilities) - Lockers - 1 per cycle rack - Dedicated drying space</p>		1			Cycle storage space has been suitably allocated within the shell and core works however the fit-out of the space is still to be developed.
TRA 04 - Maximum car parking capacity	2	<p><b>Two credits-Car parking capacity</b> For offices with AI &lt;4, one credit achieved when no more that 1 car parking space per 3 building users is provided and two credits for less than 1 per 4.</p>	2				MCM basement drawings demonstrate that only 10 car parking spaces are provided, therefore the credits are achieved.
TRA 05 - Travel plan	1	<p><b>One credit-Travel plan</b> Achieved when a BREEAM compliant site specific travel plan is developed and the recommendations are implemented. It must be noted that the Tenant may need to review/alter/extend the travel plan developed by the Landlord.</p>		1			<p>i-Transport have issued a compliant Transport Assessment and TP. This includes: - 10 car parking spaces (4 DDA + 4 electric charging points) - 100 cycle storage spaces</p> <p>The TA confirms that the proposed site will not have a significant impact on existing transport infrastructure, and that the TP was based on the existing travel plan and best practice which remains relevant therefore demonstrates Client involvement.</p> <p>This credit is subject to the fit-out specification of the cycle spaces.</p>

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WATER - Requirements

C T P U

Comments

WAT 01 - Water consumption	5	<b>Up to five credits-Water consumption</b> Achieved for reducing the water consumption on site via water efficient fittings and/or water recycling systems. The water consumption (L/person/day) is calculated based on the following 'domestic scale' water-consuming components: WCs, Urinals, Taps, Showers, Baths, Dishwashers (domestic and commercial sized) and Washing machines (domestic and commercial or industrial sized).  Any greywater systems must be specified and installed in compliance with BS 8525-1:2010 Greywater Systems - Part 1 Code of Practice. Any rainwater systems must be specified and installed in compliance with BS 8515:2009 Rainwater Harvesting Systems - Code of practice. <b>One credit minimum requirement for Very Good and Excellent ratings.</b> <b>Two credits minimum requirement for Outstanding rating.</b>		5			<p>GDM MEP Specification confirms that greywater + rainwater harvesting have been specified with the inclusion of a blue roof. GDM have completed preliminary calculations which demonstrates that based on a typical W/C flush arrangements and the catering and sanitaryware performance below, that 5 + 1 innovation credit can be achieved.</p> <p>The credits can only be closed following the detailed design of the catering areas and shower block.</p>
		<b>EXEMPLARY CRITERIA</b> One credit when a 65% water reduction over the BREEAM base case is achieved.		1			As above.
WAT 02 - Water monitoring	1	<b>One credit-Water monitoring</b> 1. A water meter on the mains water supply to each building is specified. <b>This is a minimum requirement for Good rating and above.</b> 2. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area. 3. Each meter (main and sub) has a pulsed output and is connected to the BMS is present.		1			<p>GDM Specification for the shell and core includes for full water submetering of the mains incoming supply, as well as separate water monitoring for the shower block and catering areas. This credit will be closed once the fit-out design is finalised to ensure that all areas consuming water are specified with submetering.</p>
WAT 03 - Major leak detection	1	<b>One credit-Water leak detection system</b> A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be: a. A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks is installed. b. Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. d. Programmable to suit the owner/occupiers' water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.	1				<p>A compliant water leak detection system has been specified.</p>
	1	<b>One credit-Flow control device</b> A time controller, a programmed time controller, a volume controller, a presence detector and controller or a central control unit is installed to regulate the supply of water to each WC area/facility according to demand.	1				<p>GDM MEP Specification for the shell and core includes for flow control devices to all WC areas.</p>
WAT 04 - Water efficient equipment	1	<b>One credit-Water efficient equipment</b> 1. The design team has identified all unregulated water demands that could be realistically mitigated or reduced (typically irrigation and/or process water). 2. System(s) or processes have been identified to achieve a meaningful reduction of the unregulated water demand.		1			<p>GDM Specification for the shell and core includes rainwater and greywater harvesting which will feed a CAT 5 tank which will be utilised for irrigation. A landscape architect has been appointed who is undertaking a detailed design to ensure that the final irrigation strategy captures a compliant source of potable water.</p>

Av

MATERIALS - Requirements

C T P U

Comments

MAT 01 - Life cycle impacts	6	<p><b>Mat 01 Life Cycle Impact of Materials - Upto 6 credits available</b> Credits are therefore awarded on an area-weighted basis, comparing the new construction and refurbishment areas as defined within the BREEAM bespoke application.</p> <p><b>Refurbishment Areas</b> <b>Upto 6 credits - Project Life cycle assessment study (Refurbishment) (Option 1)</b> Upto 6 credits are available where an LCA is undertaken for the refurbishment portions and maximum credits are achieved for the environmental performance of materials which considers new vs. retained, and where new EPDs are specified.</p> <p><b>Up to four credits-Life cycle Impact (Refurbishment) (Option 2)</b> Where an assessment calculation is undertaken for the refurbishment portion to determine the percentage of new vs. reused building elements, where merit is given to the re-use of materials in-situ. For newly specified elements within the refurbishment zone, credits are awarded on the basis of product EPDs.</p> <p><b>New Build Areas</b> <b>Up to six credits-Life cycle Impact (New Construction)</b> Achieved for using materials with an A/A+ rating in the Green Guide to Specification for main materials including: external walls, windows, roof, upper floor slab, internal walls and floor finishes/coverings.</p>		1	1	4	Credit under review as requires input from the fit-out works.
		<p><b>EXEMPLARY CRITERIA-Life cycle impact</b> Additional credits can be achieved for the environmental performance of the building materials where they go beyond compliance. This requires that EPDs are specified for the majority of all new building and refurbishment areas which can provide extremely onerous.</p>				2	Credit not targeted.
MAT 03 - Responsible sourcing of materials		<p><b>Pre-requisite</b> All timber and timber based products used on the project is 'Legally harvested and traded timber' (see <a href="#">This is a minimum requirement for achieving any BREEAM rating.</a></p>					Legally sourced timber is a minimum requirement and therefore compliance will be achieved by the contractor.
	1	<p><b>One credit - Sustainable procurement plan</b> The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan covering: 1. Risks and opportunities are identified against a broad range of social, environmental and economic issues. BS 8902:2009 guidance. 2. Aims, objectives and targets to guide sustainable procurement activities. 3. The strategic assessment of sustainably sourced materials available locally and nationally. There should be a policy to procure materials locally where possible. 4. Procedures are in place to check and verify that the plan is being implemented/adhered to (KPI's).</p>		1			The Principal Contractor for the shell and core works will be required to operate a sustainable procurement plan. This credit will be closed following the requirement for this to be part of the fit-out contract.
	3	<p><b>Up to three credits-Responsible sourcing of materials (RSM)</b> Credits can be achieved by ensuring that materials are responsibly sourced (BES 6001 certification, EMS/ISO14001 certification etc.). Availability of responsible sourcing certification should be checked with the manufacturer prior to procurement.</p>		1	1	1	Credit under review as requires input from the fit-out works.
		<p><b>EXEMPLARY CRITERIA-Responsible sourcing of materials (RSM)</b> When high levels of responsible sourcing (achievement of 70% of the available points) are achieved.</p>				1	Responsible sourcing of 70% of the materials is an onerous requirements and compliance cannot be guaranteed at this stage.
MAT 04 - Insulation	1	<p><b>One credit - Embodied impact</b> Insulation specified for Building envelope and building services has an Insulation index no lower than 2.5. The Insulation Index is a parameter created by the BRE to measure Embodied Impact of materials which depends on the thermal properties of the insulation, the amount of insulation and the Green Guide rating of the product. Materials selected should have low thermal conductivity and a Green Guide rating of A or A+.</p>		1			Credit under review as requires input from the fit-out works.
MAT 05 - Designing for durability and resilience	1	<p><b>Protecting vulnerable parts of the building for damage</b> Measures to prevent damage to vulnerable parts of the internal and external building and landscaping elements are specified including: - Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). - Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. - Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building façade for all car parking areas and within 2m for all delivery areas.</p>		1			Credit under review as requires input from the fit-out works.
		<p><b>Protecting exposed parts of the building from material degradation</b> Measures prevent from environmental factors and biological factors are implemented to prevent degradation from: Corrosion, dimensional change, fading/discolouration, rotting, leaching, blistering, melting, salt crystallisation and abrasion.</p>					
MAT 06 - Material efficiency	1	<p><b>One credit-Material efficiency</b> 1. Opportunities have been identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life. Example measures are: reusing existing demolition/strip-out materials, procuring materials with higher levels of recycled content, off-site manufacture or use of pre-assembled service pods. 2. Review is carried out by the design/construction team in consultation with the relevant parties at: Preparation and Brief, Concept Design, Developed Design, Technical Design and Construction.</p>		1			A material efficiency study has been considered during each RIBA stage, with input required from the fit-out to complete the credit.

Av

WASTE - Requirements

C T P U

Comments

WST 01 - Construction waste management	1	<p><b>Pre-Refurbishment Audit</b></p> <p>1. A pre-refurbishment audit is carried out at the Concept Design Stage (equivalent to RIBA stage 2) prior to strip-out or demolition works by a competent person (see Relevant Definitions) who is independent of the project.</p> <p>2. Actual waste arising and waste management routes used should be compared with those forecast from the audit and barriers to achieving targets should be investigated.</p> <p>3. The audit must be referenced in the resource management plan and cover: Identification and quantification of the key materials where present on the project, Potential applications and any related issues for the reuse and recycling of the key materials in accordance with the waste hierarchy, Identification of local reproprocessors or recyclers, Identification of overall recycling rate for all key materials, Identification of reuse targets where appropriate and Identification of overall landfill diversion rate for all key materials.</p>		1			A Pre-Refurbishment Audit has been completed by Active and will be reference within the Resource Management Plan during the shell and core. The plan will also need to be included within the fit-out works with results from the shell and core also included.
	3	<p><b>Up to three credits - Construction resource efficiency</b></p> <p>1. A Resource Management Plan (RMP) has been developed covering the non-hazardous waste related to on-site construction and dedicated off-site manufacture or fabrication (including demolition and excavation waste) generated by the building's design and construction.</p> <p>2. Where construction waste related to on-site construction and dedicated off-site manufacture/fabrication (excluding demolition and excavation waste) meets or is lower than the following:</p> <ul style="list-style-type: none"><li>- One credit ≤11.7m3 or ≤5.02 tonnes</li><li>- Two credits ≤5.1m3 or ≤2.26tonnes</li><li>- Three credits ≤2.36 or ≤0.96tonnes</li></ul> <p>3. Where existing buildings on the site will be demolished a pre-demolition audit of any existing buildings, structures or hard surfaces is completed and referenced in the RMP.</p> <p>1 credit minimum requirement for Outstanding rating.</p>		2		1	Requirements for waste have been included within the Demolition and Principal Contractor's requirements however this also needs to be assessed during the fit-out.
	2	<p><b>Two credits - Reuse and direct recycling of materials (Refurbishment areas only)</b></p> <p>Credits are achieved when waste materials are either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling.</p> <p>One credit is achieved when 50% of the materials achieve comply with the above and 2 credits when compliance is achieved for 75% of the materials.</p>				2	Credits not sought.
	1	<p><b>One credit - Diversion of resources from landfill</b></p> <p>1. The following percentages of non-hazardous construction (on-site and off-site manufacture/fabrication in a dedicated facility), demolition, strip out and excavation waste (where applicable) generated by the project have been diverted from landfill:</p> <ul style="list-style-type: none"><li>- <b>One credit:</b> 81% by volume or 87% by weight of the construction waste and 87% by volume or 93% by weight of the demolition waste.</li></ul>		1			Requirements for waste have been included within the Demolition and Principal Contractor's requirements however this also needs to be assessed during the fit-out.
		<p><b>EXEMPLARY CRITERIA</b></p> <p>When the above targets are increased as follows:</p> <ul style="list-style-type: none"><li>- ≤1.44m3 or ≤0.62tonnes</li><li>- 92% by volume or 95% by weight of the construction waste, 92% by volume or 96% by weight of the demolition waste and 95% by volume or 95% by weight of the excavation waste are diverted from landfill.</li></ul>				1	Credits not sought.
WST 02 - Recycled aggregates	1	<p><b>One credit-Recycled aggregates</b></p> <p>1. At least 25% (by weight or volume) of the high grade aggregate specified is recycled or secondary aggregate. In addition to this, there are minimum % for each application that must be met.</p> <p>2. The recycled or secondary aggregates must be either: Construction, demolition and excavation waste obtained on-site or off-site or secondary aggregates obtained from a non-construction post-consumer industrial by product source.</p> <p>Application and Recycled / Secondary Content</p> <ul style="list-style-type: none"><li>- Structural frame 15%</li><li>- Bitumen or hydraulically bound base, binder, and surface courses for paved areas &amp; roads 30%</li><li>- Building foundations 20%</li><li>- Concrete road surfaces 15%</li><li>- Pipe bedding 100%</li><li>- Granular fill and capping 100%</li></ul>				1	Credits not sought.
		<p><b>EXEMPLARY CRITERIA-Recycled aggregates</b></p> <p>1. In addition to the above, the total high grade recycled aggregate specified is 35% (by weight or volume) and the contributing recycled or secondary aggregate are not be transported more than 30 km by road transport.</p>				1	This credit has not been sought as it is deemed onerous.
WST 03 - Operational waste	1	<p><b>One credit-Operational waste</b></p> <p>1. A dedicated, clearly labelled, and accessible area is provided for the storage of recyclable materials compliant with the following size:</p> <ul style="list-style-type: none"><li>- At least 2m2 per 1000m2 of net floor area for buildings &lt; 5000m</li><li>- A minimum of 10m2 for buildings ≥5000m2</li><li>- An additional 2m2 per 1000m2 of net floor area where catering is provided (with an additional minimum of 10m2 for buildings ≥5000m2).</li></ul> <p>The net floor area should be rounded up to the nearest 1000m</p> <p>2. Where the consistent generation in volume of the appropriate operational waste streams is likely to exist, the following facilities are provided:</p> <ul style="list-style-type: none"><li>- Static waste compactor(s) or baler(s);</li><li>- Vessel(s) for composting OR adequate space(s) for storing segregated food waste and compostable organic material.</li><li>- Where organic waste is to be stored/composted on-site, a water outlet is provided adjacent to or within the facility.</li></ul> <p>This credit is a minlimum requirement for Excellent and Outstanding ratings.</p>		1			Operational waste strategy will be developed during the fit-out stages along with the catering consultant.
WST 04 - Speculative floor and ceiling finishes	1	<p><b>One credit-Speculative floor and ceiling finishes</b></p> <p>For tenanted areas (where the future occupant is not known), prior to full fit-out works, carpets, other floor finishes and ceiling finishes have been installed in a show area only.</p> <p>In a building developed for a specific occupant, that occupant has selected (or agreed to) the specified floor and ceiling finishes.</p>	1				As this is an occupant fit-out this credit will be achieved.



WST 05 - Adaptation to climate change	1	<b>One credit-Adaptation to climate change – structural and fabric resilience</b> Conduct a climate change adaptation strategy appraisal for structural and fabric resilience no later than RIBA Stage 2 or equivalent. The strategy should be based on an iterative risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages: Hazard identification, Hazard assessment, Risk estimation, Risk evaluation and Risk management.		1			Credit has been sought and will be closed upon final façade specification.
		<b>EXEMPLARY CRITERIA</b> In addition to the above, the following credits have been achieved: - HEA 04 thermal comfort credit - At least 8 credits under ENE 01 - The passive design credit of ENE 04 - A minimum of 3 credits under WAT 01 - Material degradation credit of MAT 05 - One flood risk credit and two surface run-off credits under POL 03		1			On the basis that all the relevant credits have been achieved (see adjacent) the credit has been achieved.
WST 06 - Functional adaptability	1	<b>One credit-Functional adaptability</b> 1. A building-specific functional adaptation strategy study has been undertaken by the client and design team no later than RIBA Stage 2, which includes recommendations for measures to be incorporated to facilitate future adaptation. the strategy should consider: - The potential for major refurbishment, including replacing the façade. - Replacement of all major plant within the life of the building - Adaptability of the internal environment to accommodate changes in working practices. - Adaptability to change in-use. - Accessibility to local services. 2. Measures are adopted no later than RIBA Stage 4 unless unfeasibility is demonstrated.		1			Functional adaptability is largely based on the internal design and therefore this credit is subject to the fit-out design.

Av LAND USE AND ECOLOGY - Requirements

C T P U

LE 02 - Ecological value of site and protection of	1	<b>One credit-Protection of Ecological Features</b> 1. All existing features of ecological value (see Relevant definitions) within and surrounding the refurbishment or fit-out zone and site boundary area are adequately protected from damage during clearance, site preparation and refurbishment or fit-out activities in line with BS42020: 2013. 2. In all cases, the principal contractor is required to construct ecological protection recommended by the suitably Qualified Ecologist (SQE), prior to any preliminary site refurbishment or fit-out or preparation works (e.g. erection of temporary site facilities).	1				The Ecology Consultancy were appointed at stage 2 and have provided a preliminary ecology report with a series of recommendations for green roofs, biodiverse / biosolar roofs, planting.  Birds nesting has been identified as having potential for breeding.  The site has been defined as being of "low ecological value".
LE 04 - Enhancing site ecology	1	<b>One credit-Ecologist's report and recommendations</b> A suitably qualified ecologist (SQE) is appointed no later than RIBA Stage 1 an Ecology Report based on a site visit/survey by the SQE is developed no later than RIBA Stage 2 and the recommendations are implemented.		1			The Ecology Consultancy were appointed at stage 2 and have provided a preliminary ecology report with a series of recommendations for green roofs, biodiverse / biosolar roofs, planting.  Townshend Architect have been appointed to develop the design for the following ecological features which are not part of the shell and core: - Green roof - Biodiverse / biosolar roofs - Planting - Bird nests
LE 05 - Long term impact on biodiversity	2	<b>Up to two credits-Long term impact on biodiversity</b> 1. A Suitably Qualified Ecologist (SQE) is appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the design and construction process. 2.A landscape and habitat management plan, is produced covering at least the first five years after project completion in accordance with BS 42020:2013 Section 11.1. 3.Where in addition to the above the below is implemented (2 measures - 1 point; 4 measures - 2 points). - The contractor nominates a Biodiversity Champion. - The contractor trains the site workforce on how to protect site ecology during the project. - The contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of the construction process. - Where a new ecologically valuable habitat appropriate to the local area is created. - Where flora and/or fauna habitats exist on-site, the contractor programmes site works to minimise disturbance to wildlife.		2			A 5 year landscape and habitat management plan will be developed once the landscape and planting strategy has been developed which overlaps with the shell and core and fit-out packages.

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POLLUTION Requirements

C T P U

Comments

POL 01 - Impact of refrigerants		<p><b>Pre-requisite</b></p> <p>All systems (with electric compressors) comply with the requirements of BS EN 378:2008 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.</p>					GDM Stage 4 specification for the shell and core chillers includes compliance with this standard.
	2	<p><b>Up two credits - Impact of refrigerant</b></p> <p>- Two credits - the Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) ≤ 100 kgCO2e /kW cooling/heating capacity or if GWP ≤10.</p> <p>- One credit - the DELCO2e ≤ 1000 kgCO2e /kW cooling/heating capacity.</p>		1		1	Pol 01 calculations have been completed by CoolCom which confirms that 1 credit can be achieved for the proposed systems in the shell&core. The requirement also applies to any cooling refrigerants specified as part of the fit-out.
	1	<p><b>One credit-Leak detection</b></p> <p>1. A permanent automated refrigerant leak detection system or an in-built automated diagnostic procedure for detecting leakage is installed.</p> <p>2. The system must be capable of continuously monitoring for leaks and of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident.</p> <p>• The system must be capable of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident</p> <p>• An automated permanently installed multi-point sensing system, designed to continuously monitor the atmosphere in the vicinity of refrigeration equipment and, in the event of detection, raise an alarm. The system may be aspirated or have multiple sensor heads linked to a central alarm unit or BMS. Various sensor types are available including infra-red, semi-conductor or electro-chemical.</p>		1			GDM Specification includes a leak detection system for the shell and core. Further leak detection may be required for the fit-out works MER and SER rooms.
POL 02 - NOx emissions	3	<p><b>Up to three credits-NOx emissions</b></p> <p>Where NOx emissions associated to heating and hot water demand under normal operating conditions are as follows:</p> <p>- One credit ≤100 mg/kWh</p> <p>- Two credits ≤70mg/kWh</p> <p>- Three credits ≤40mg/kWh</p>				3	Credits not sought.
POL 03 - Surface water run-off	2	<p><b>Up to two credits-Flood resilience</b></p> <p><b>Two credits - Low flood risk</b></p> <p>1. A site-specific flood risk assessment (FRA) confirms low annual probability of flooding from all sources.</p> <p><b>One credit - Medium/high flood risk</b></p> <p>2. A site specific FRA confirms medium or high annual probability of flooding the is not in a functional floodplain and one of the following is achieved:</p> <p>- The ground level of the building and access to both the building and the site, are designed at least 600mm above the design flood level</p> <p>- The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2011.</p>		2			According to the EA flood risk map, the building is in an area of low flood risk. The credits are subject to a detailed FRA which is being undertaken by Ramboll.
	2	<p><b>Two credits - Surface water run-off</b></p> <p><b>One credit - neutral impact on surface water</b></p> <p>7. There is no increase in the impermeable surfaces as a result of the refurbishment works; <b>OR</b></p> <p>8. If there is an increase in the impermeable surface as a result of the refurbishment works then the following must be met:</p> <p>a. <b>Hard standing areas</b> - where there is an extension or increase in the hardstanding areas and hence an increase in the total impermeable area as a result of the refurbishment works, the hardstanding area must be permeable or be provided with on-site SuDS to allow full infiltration of the additional volume, to achieve the same end result. The permeable hardstanding must include all pavements and public rights of way, car parks, driveways and non-adoptable roads, but exclude footpaths that cross soft landscaped areas which will drain onto a naturally permeable surface.</p> <p>b. <b>Building extension</b> - where there is an increase in building footprint, extending onto any previously permeable surfaces, the additional run-off caused by the area of the new extension must be managed on-site using an appropriate SuDS technique for rainfall depths up to 5mm.</p> <p><b>Two credits - reducing run-off</b></p> <p>9. An Appropriate Consultant (see Pol 03 Flood risk management and reducing surface water run-off) has been used to design an appropriate drainage strategy for the site.</p> <p>10. Either of the following criteria are met:</p> <p>a. There is a decrease in the impermeable area by 50% or more, from the pre-existing impermeable hard surfaces; <b>OR</b></p> <p>b. Where run-off as a result of the refurbishment is managed on-site using source control achieving the following requirements:</p> <p>i. The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event has been reduced by 50% from the existing site.</p> <p>ii. The total volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration has been reduced by 50%.</p> <p>iii. An allowance for climate change must be included for all of the above calculations; this should be made in accordance with current best practice planning guidance.</p>		2			<p>Planning requires that there is a 50% reduction in discharge from the site as well as considering climate change scenario for a 6 hour 1 in 100 year flood event. Blue roof calculations have been completed as part of the planning.</p> <p>GDM drawings have been provided for a blue roof strategy although this is currently being revised based on planning feedback. This includes removal of blue roof at roof terrace on level 5.</p>
	1	<p><b>One credit-Minimising watercourse pollution</b></p> <p>1. There is no discharge from the developed site for rainfall up to 5mm.</p> <p>2. Low risk source of watercourse pollution areas have appropriate SuDS techniques.</p> <p>3. High risk areas have petrol and oil separators.</p> <p>4. A means of containment is fitted to the site drainage system for chemical/liquid gas storage areas.</p> <p>5. All water pollution prevention systems have been designed and installed in accordance with Pollution Prevention Guideline 3 (PPG 3). For vehicle washing areas systems comply with Pollution Prevention Guidelines 13</p> <p>6. A comprehensive and up-to date drainage plan is developed.</p> <p>7. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.</p> <p>8. All external storage and delivery areas designed and detailed in accordance with the current best practice planning guidance.</p>		1			This credit is currently under review by Ramboll.

POL 04 - Reduction of night time light pollution	1	<b>One credit - Reduction of night time light pollution</b> 1. External lighting complies with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2011. 2. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. 3. Safety or security lighting used between 23:00 and 07:00, complies with the lower levels of lighting in Table 2 of the ILP's Guidance notes. 4. Illuminated advertisements comply with ILE Technical Report 5 – The Brightness of Illuminated Advertisements. - N/A		1			External lighting consultant is currently developing the external lighting specification which overlaps with the shell and core and fit out design.
POL 05 - Reduction of noise pollution	1	<b>One credit-Reduction of noise pollution</b> 1. The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development (within 800m radius), is no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level. The noise impact assessment must be undertaken by a suitably qualified acoustic consultant and must have been developed in compliance with BS 7445.		1			A Noise impact assessment has been completed by Sandy Brown which confirms that the shell and core will be compliant. Further report needed to capture the fit out works and any further systems.

Av INNOVATION Requirements

T P U

Comments

Innovation	1	Additional credits are available for Approved Innovations not currently recognised by an existing BREEAM issue.					1	No approved innovation credits targeted.