C80 solutions
Straightforward Building Compliance

BREEAM Pre-Assessment Report
UK New Construction V6

Proposed Industrial Development
Jubilee Works
Clifton Street
Manchester
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Project: 17402

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Issue/revision	Issue 00 WIP	Revision 01	Issue 02 Draft	Issue 03 For Contract
Remarks				
Date	20/11/2023			
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Project number File reference	17402			

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1 Introduction

C80 SOLUTIONS has been commissioned by PHA Architects to conduct a BREEAM pre-assessment on the proposed new industrial development at Jubilee Works, Clifton Street, Manchester.

The proposed scheme has been subject to a pre-assessment, carried out using the BREEAM UK New Construction V6 methodology. Pre-assessments are normally undertaken for funding, planning or viability purposes and are generally undertaken as early as possible in the design process, before all the design and servicing options have been confirmed. The pre-assessment has been used to evaluate the site location, existing infrastructure and proposed development against the evidential requirements of BREEAM.

The design team has set a target rating of BREEAM Very Good. The BREEAM pre-assessment has been carried out on the current proposed design to determine the BREEAM UKNC V6 rating achievable for the development, confirm the specification required and specifically identify who is responsible for each BREEAM issue to achieve BREEAM certification of Very Good.

The purpose of this report is to provide the design team and principal contractor with information relating to key actions required to achieve a successful certification. The design team should ensure that the design accounts for the BREEAM requirements identified. Where the standard specification and other construction specifications and drawings identify more onerous requirements, they will take precedence.

The implementation of the requirements shall be assessed and evaluated during the design and construction process and finalised on completion of the building by the BREEAM assessor. The principal contractor shall provide all the relevant evidence required for the assessor to review and determine if the evidence provided is sufficient to award each credit.

Disclaimer

This report has been prepared by C80 SOLUTIONS Ltd, using all reasonable skill, care and diligence on behalf of the consultant. The analysis and pre-assessment to which this report relates has been carried out in accordance with the strict quality requirements prescribed by the Building Research Establishment (BRE).

C80 SOLUTIONS Ltd has made use of evidence supplied by the design team. This has been both physical, e.g. documentation such as reports, drawings, plans, correspondence, etc. and verbal commitments from meetings, telephone calls, etc. C80 SOLUTIONS's professional liability is strictly limited to the provision of assessment services against criteria set out by BRE. The consultant accepts no responsibility for misinformation or inaccurate information supplied by any third party as part of this assessment.

This report has been prepared in accordance with the scope of C80 SOLUTIONS's appointment with its client and is subject to the terms of that appointment. It is addressed to and for the sole use of and reliance of C80 SOLUTIONS's client and only for the purposes stated in the report, for which it was prepared and provided. No person other that the client may copy (in whole or part) use or rely on the contents of this report, without prior written permission of the Company Secretary of C80 SOLUTIONS Ltd. Any advice, opinions or recommendations within this report should be read and relied upon only in the context of the document as a whole. The contents of this report are not to be construed as providing legal, business or tax advice or opinion.

If the reader disagrees with any statement or finds any information contained within this document to be inaccurate, C80 SOLUTIONS requests that the author is informed immediately.

2 BREEAM Assessment Methodology

BREEAM (Building Research Establishment's Environmental Assessment Method) New Construction V6 is a voluntary scheme used to assess the environmental life cycle of new non-domestic buildings at the design and construction stages. It covers a range of different building types, including commercial (offices, industrial and retail), public (education, healthcare, prisons and law courts), multi-residential accommodation and a range of 'other' buildings including hotels, museums, community centres conference halls, sports centres, transport hubs and research centres.

BREEAM Assessment criteria include (up to) fifty-one assessment issues, categorised in ten environmental sections of sustainability. Each issue defines a level of performance against which the assessed building demonstrates compliance, using appropriate evidence, in order to achieve the corresponding number of available BREEAM credits.

BREEAM New Construction V6 assessments are generally undertaken in two stages: firstly the design stage, which leads to an Interim BREEAM certified rating; and secondly the post construction stage, which leads to a Final BREEAM certified rating.

The full BREEAM technical guidance is available on request.

The BREEAM rating benchmarks for new construction projects assessed using the 2018 version of BREEAM are as follows.

BREEAM rating	**% Score**
Outstanding	≥ 85
Excellent	≥ 70
Very Good	≥ 55
Good	≥ 45
Pass	≥ 30
Unclassified	< 30

The BREEAM rating benchmarks enable a client and all other stakeholders to compare the performance of a newly constructed building with other BREEAM rated buildings, and the typical sustainability performance of a stock of new non-domestic buildings in the UK. In this respect each BREEAM rating broadly represents performance equivalent to:

BREEAM rating	**% Score**
Outstanding	Less than top 1% of UK new non-domestic buildings (innovator)
Excellent	Top 10% of UK new non-domestic buildings (best practice)
Very Good	Top 25% of UK new non-domestic buildings (advanced good practice)
Good	Top 50% of UK new non-domestic buildings (intermediate good practice)
Pass	Top 75% of UK new non-domestic buildings (standard good practice)
Unclassified	

BREEAM also sets minimum standards of performance in key areas. E.g., management, energy, water, waste, ecology etc. To achieve a particular BREEAM rating, the minimal overall percentage score and the minimum standards applicable to that rating must be complied with.

3 The BREEAM Process

Early awareness and implementation of the BREEAM requirements will enable the project team to adopt a consolidated approach to the environmental and sustainable aspects of a development. The most successful BREEAM projects are those where a BREEAM Assessor is engaged in the early stages to agree a brief that will:

- Suit the users of the building
- Satisfy all regulatory and BREEAM criteria
- Engage all project stakeholders and design team members
- Work on an agreed and realistic budget to keep costs under control.

A **BREEAM AP** is an individual qualified and accredited by BRE as a specialist in built environment sustainability, environmental design and assessment issues. The BREEAM AP is one type of 'sustainability champion' defined and recognised in BREEAM. The role of the BREEAM AP is to facilitate the project team's effort to successfully schedule activities, set priorities and negotiate the trade-offs required to achieve a target BREEAM rating when the design is formally assessed. In recognition of the significant contribution a BREEAM AP can make to the design process, extra credits are given in BREEAM schemes for appointing and using an AP. This is an entirely optional, extra level of consultancy for the BREEAM assessment that is usually only required when looking to achieve highest BREEAM grades and is not currently being recommended for this project.

A licensed **BREEAM Assessor** has a deep level of understanding and competency in the scheme for which they are licensed and monitored by BRE Global Ltd. Their role is to manage the formal assessment process, review evidence submitted by the project team for compliance and apply for certification of that assessment on behalf of the client.

The three key stages in BREEAM are:

Pre-assessment – A pre-assessment workshop takes place to outline the project, identify credit requirements, agree credits targeted, record commitments and agree a predicted score.

Design Stage – Credits are awarded as evidence is received from the project team, and reviewed by the assessor. The assessor will update the report periodically throughout the project and issue to the design team on request. The assessor will submit the Design Stage/ Interim report to BRE for formal approval and certification on receipt of all compliant evidence.

Post-construction Stage – Following practical completion of the project, and receipt of 'as built' evidence from the project team, the assessor will conduct a site visit. The principal contractor will be responsible for the submission of all evidence required to obtain Post-construction Stage/ Final certification. The assessor will submit the Post-construction Stage/ Final report to BRE for formal approval and certification.

4 Overview

C80 SOLUTIONS has been commissioned to provide BREEAM assessment services for a proposed development of 2 new industrial units by PHA Architects on the proposed new industrial development at Jubilee works, Clifton Street, Manchester.

This appointment includes the setting and achievement of BREEAM performance targets for the project and the activity is undertaken during the feasibility stage (Stage 1, Preparation and Brief stage, as defined by the RIBA Plan of Work 2013 or equivalent). The defined BREEAM performance targets are then formally agreed no later than the Concept Design stage (RIBA Stage 2 or equivalent).

The appointment to monitor progress against the agreed BREEAM performance target(s) continues throughout the design process and progress is formally reported to the client and design team. The BREEAM Assessor attends key project/design team meetings during the Concept Design, Developed Design and Technical Design stages, as defined by the RIBA Plan of Work 2013, reporting during, and prior to, completion of each stage. The purpose of this appointment is to establish a realistic baseline for the development from which the design team can explore the options available to enhance its performance.

This pre-assessment sets out the recommended route to Very Good and identifies the most cost effective and low risk credits to target. As the project progresses some credits could be removed or added to the targeted list subject to approval from the developer (see below).

The pre-assessment report is designed to show, based on the information available and commitments provided, how the development is capable of achieving a BREEAM Very Good rating and to detail the next steps of the BREEAM assessment process.

5 Project Description

The site is located East of Manchester City Centre. The site is a former industrial unit, which is to be demolished due to fire damage and the proposed development built in its place, within the same site boundary.

The proposed building will comprise 2 new industrial units, with associated office space, and a total operational GIA of 1,609.53m². The BREEAM assessment will also look at the wider site sustainability, which includes the parking and external areas, including the planted areas.

This pre-assessment considers the proposed development of a store, associated landscaping and car parking. The analysis evaluates the proposed development against BREEAM requirements, and the impact of the existing site location and infrastructure.

It is recommended that in order to comfortably achieve a BREEAM Very Good rating, a score of c.57% should be considered as the minimum target at this early stage in the development of the proposed scheme. This would provide a contingency to allow for unforeseen issues arising between now and the end of construction and also to allow for BRE's QA check of the final BREEAM certification assessment.

The design team advise that the proposed scheme is presently deemed to have reached but not completed RIBA Stage 2 Concept Design.

6 Pre-assessment workshops

A Stage 1 BREEAM pre-assessment workshop with the design team to talk through the BREEAM criteria. The workshop was used to develop a predicted score based on information available at that time. At the BREEAM workshop, all credits were reviewed and classified using a simple scheme to assess the ease, associated cost and likelihood with which they could be achieved by the proposed development. This provides a straightforward method for the design team to assess whether the target rating is achievable, and if so, the most cost-effective options to achieve this rating.

The following members of the design team contributed to the standard store specification BREEAM workshop.

BREEAM Workshop (1) Attendees		
		Client Construction Consultant
		Architecture and Structural Engineering
		Structural Engineering
		MEP

After the workshop the design team was given a period of time to review the commitments made and to respond with any further comments or information. With the target rating agreed, the assessor has completed and issued the pre-assessment report based on the standard store specification.

As the scheme has progressed, site specific analyses have been undertaken and the design team has expanded to include the following members.

BREEAM Workshop (2) Attendees		
		Client Acquisitions Consultant
		Construction Architect
		Planning Consultant
		Transport Assessment and Travel Plan
		FRA and Drainage
		Ecology
		Air Quality
		Ground Investigation
		Acoustician External Noise
		Acoustician Internal Noise
		MEP

Further consultation workshops have taken place with the design team where decisions have a direct and significant impact on the building's sustainability credentials and performance. These consultations have taken place before all the design and servicing options have been confirmed, and reflect the site location, existing infrastructure and proposed development against the evidential requirements of BREEAM.

7 Design Stage and Post-Construction Stage Assessments

This assessment will be monitored by Harry Hinchliffe of C80 Solutions through BREEAM Projects platform, and all evidence required for BREEAM certification must be submitted via this platform.

This enables the design team to issue regular BREEAM trackers to show responsibilities for achieving, information required to award and status of targeted credits.

Substitute Credits

As described above, this pre-assessment sets out the recommended route to Very Good and identifies the most cost effective and low risk credits to target. As the project progresses some credits could be removed or added to the targeted list subject to approval from the design team.

If alternative credits to those specified are proposed, the principal contractor must submit details with the tender giving reasons for each proposed substitution. Substitutions, which have not been notified at tender stage, may not be considered.

For the avoidance of doubt, the principal contractor will be responsible for the submission of all evidence required to obtain Post-construction Stage/ Final certification. The principal contractor will be responsible for all post-construction testing.

8 Target BREEAM rating

A target rating of BREEAM Very Good would place the development nationally within the top 25% of UK new non-domestic buildings.

The Pre-assessment Schedule (pages 13 onwards) shows the current predicted BREEAM score and rating.

The design team have undertaken an exercise to evaluate the measures required to achieve BREEAM Very Good. Potential additional credits over the standard model scheme were costed based on estimates from the various representatives of the design team. The analysis indicates that a predicted score of 55%+ for BREEAM Very Good could be achieved. However, this requires additional consultant reports and analyses and specification items over the standard model store with associated cost uplifts.

There are a number of credits that have been assumed at this stage that should be considered 'at risk', relying on analyses and activities further along the development lifecycle which may be lost if timescales are not adhered to or if actions are not carried out to BREEAM evidential requirements.

There are a number of additional credits not assumed at pre assessment stage which may be gained at a later stage when further evidence is provide or if changes are made to the project.

As the predicted score is only just over the 55% needed for a Very Good rating the 'at risk' and additional credits should not be considered optional at this stage. To give some margin the design team should be aiming to achieve at least 60% in case any credits we have assumed in this pre assessment prove too difficult to achieve.

The pre-assessment schedule, at the end of this document, presents a route by which BREEAM very Good could be achieved.

9 Early actions required to maximise BREEAM score

BREEAM outline at which RIBA stage credits should be addressed and ideally when these should be considered by the project team to achieve the highest possible BREEAM rating at the minimum cost. In certain BREEAM issues, BRE also stipulate the RIBA stage at which consultant appointment, consultation and analysis must have taken place. If these deadlines are missed and advice taken too late, the credit cannot be awarded, and associated credits are also withheld. (See appendix GN37 (p15 onwards) *BREEAM-UK-NC-2018-assessment-timeline-v1.0*).

10 RIBA stage deadlines

RIBA Stage	0	1	2				3	4	5	6	7
	Strategic Definition	**Preparation and Brief**	**Concept Design**				**Developed Design**	**Technical Design**	**Construction**	**Handover and Close Out**	**In Use**
	Strategic or initial project brief	Man 01 – Project Brief	Man 01 – Stakeholder consultation (Project Delivery Planning)	Man 01 – Stakeholder consultation (Interested '3rd' Parties)	Man 01 – BREEAM AP – Concept Design (Pre-requisite for awarding Man 01 BREEAM AP – Developed Design)	Planning	Man 01 – BREEAM AP – Developed Design	Man 01 – Stakeholder Feedback (Interested '3rd' Parties)	LE 05 - Long term ecology management and maintenance	Man 04 - Commissioning and testing programme	Man 05 Aftercare - POE
	Establish Project / Design Programme	Mat 03 – Sustainable Procurement Plan	Man 02 – LCC (Elemental)	Hea 02 Indoor Air Quality Plan	Hea 06 – Security Needs Assessment		Man 04 – Appointment of Commissioning Manager	Man 02 – LCC (Options)		Man 04 – Building user guides (General and Facilities Management)	
		Mat 06 - Material efficiency	ENE 01 – Operational Energy performance	ENE 04 - LZC Feasibility Study	ENE 04 - Passive Design Analysis		Hea 04 – Thermal comfort	Man 02 – LCC (Options)		Man 04 – Thermal performance testing	
		TRA 01 –Transport assessment	Mat 01 – Building LCA ****SUBMIT results to BRE prior to Planning Application****	Mat 03 – Sustainable Procurement Plan	Mat 06 - Material efficiency		Mat 06 - Material efficiency	Mat 01 – Building LCA - Update ****SUBMIT results to BRE prior to Construction****		Man05 Aftercare support – handover meeting	
		LE 02 Identifying &understanding the risks & opportunities for the project. This is a pre-requisite for awarding LE03, LE04 and LE05	Wst01 – Pre-demolition Audit	Wst01 – Construction waste management	Man 01 – Contractual performance targets - BREEAM		Wst06 – Functional Adaptability - recommendations	Mat 06 - Material efficiency		Hea05 – Acoustic performance testing	
			Wst05 – Climate change adaptation strategy	Wst06 – Functional Adaptability - recommendations	TRA 01 – Travel Plan			Wst05 – Climate change adaptation update		ENE 01 – Operational energy performance - implementation	
		LE 03 Managing negative impacts on ecology	Mat 01 – Building LCA (Core building services)	ENE 01 – Regulated Energy performance – reduction of carbon emissions	POL 03 – Surface Water Run-off			Wst06 – Functional Adaptability - implementation		LE05 - Landscape and ecology management plan	
			POL 03 – Reduction of noise pollution								

11 Summary and recommendations

As described above, the BREEAM Assessment criteria include various assessment issues, categorised in ten environmental sections of sustainability. Each issue defines a level of performance against which the assessed building demonstrates compliance, using appropriate evidence, in order to achieve the corresponding number of available BREEAM credits.

The proposed scheme has been subject to a BREEAM pre-assessment and a suggested route to achieve Very Good has been identified.

The design team and principal contractor are required to review the credits associated with their discipline in more detail, noting that the required mandatory credits must be achieved to receive BREEAM certification. All BREEAM requirements will then be incorporated into the relevant contractual, sub-contractual and specification documentation.

It is recommended that all information should be submitted to the BREEAM Assessor as early as possible for certification.

A BREEAM rating of Very Good is considered viable for the site.

12 Pre-assessment Schedule

The following BREEAM 2018 pre-assessment schedule sets out the assumptions.

- BREEAM (Building Research Establishment's Environmental Assessment Method) is an environmental assessment method for buildings. It sets the standard for best practice in sustainable design and is used to describe a building's environmental performance.
- A BREEAM assessment includes ten categories of sustainability including; Management, Health & Wellbeing, Energy, Transport, Water, Materials, Waste, Land Use and Ecology, Pollution and Innovation.
- Credits are awarded in each of the ten categories according to performance. These credits are then added together to produce a single overall score on a scale of Pass, Good, Very Good, Excellent and Outstanding.
- To secure credits, evidence must be issued to the BREEAM Assessor demonstrating compliance with the credit criteria. Typically evidence will be in the form of drawings, specifications, reports, statements, letters etc.
- A BREEAM 2018 assessment is a two stage assessment with a report produced at Design Stage and then Post Construction. Evidence is required at each stage to secure the BREEAM credits.
- Note that included in a BREEAM 2018 assessment are Mandatory Credits which must be achieved to secure a particular rating regardless of the overall score. If the required minimum standards are not met, then the target rating will not be achieved regardless of the overall score.
- A copy of the BREEAM 2018 Technical manual is available from the BREEAM Assessor on request which gives full details of all credits and compliance requirements relevant to this project.
- Full requirement details can also be found within the BREEAM New Construction 2018 Technical manual which is available from: https://www.breeam.com/NC2018/

		Available	Current	Comments
Management				
Man 01	Project brief and design	4	2	
Man 02	Life cycle cost and service planning	4	1	
Man 03	Responsible construction practices	6	4	
Man 04	Commissioning and handover	4	3	
Man 05	Aftercare	3	3	
	Management Totals: (+exemplary)	**21 (+1)**	**13**	
	Management weighting totals:	**11%**	**6.8%**	
Hea 01	Visual comfort	2	2	
Hea 02	Indoor air quality	4	2	
Hea 04	Thermal comfort	3	3	
Hea 05	Acoustic performance	3	0	
Hea 06	Security	1	1	
Hea 07	Safe and healthy surroundings	2	0	
	Health & Wellbeing Totals: (+exemplary)	**17 (+4)**	**8**	
	Health & Wellbeing weighting totals:	**14%**	**6.58%**	
Energy				
Ene 01	Reduction of energy use and carbon emissions	13	6	
Ene 02	Energy monitoring	2	2	
Ene 03	External Lighting	1	1	
Ene 04	Low carbon design	3	2	
Ene 05	Energy Efficient Transportation Systems	0	0	
	Energy Totals: (+exemplary)	**19 (+5)**	**11**	
	Energy weighting totals:	**16%**	**9.26%**	
Transport				
Tra 01	Transport assessment and travel plan	2	2	
Tra 02	Sustainable transport measures	10	4	
	Transport Totals: (+exemplary)	**12**	**6**	
	Transport weighting totals:	**10%**	**5%**	
Water				
Wat 01	Water consumption	5	3	
Wat 02	Water monitoring	1	1	
Wat 03	Water leak detection	2	2	
	Water Totals: (+exemplary)	**8 (+1)**	**6**	
	Water weighting totals:	**7%**	**5.25%**	

Materials				
Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	7	0	
Mat 02	Mat 02 Environmental impacts from construction products - Environmental Product Declarations (EPD)	1	0	
Mat 03	Responsible sourcing of construction products	4	2	
Mat 05	Designing for durability and resilience	1	1	
Mat 06	Material efficiency	1	1	
	Materials Totals: (+exemplary)	**14 (+4)**	**4**	
	Materials weighting totals:	**15%**	**4.28%**	
Waste				
Wst 01	Construction waste management	5	3	
Wst 02	Use of recycled and sustainably sourced aggregates	1	0	
Wst 03	Operational waste	1	1	
Wst 05	Adaptation to climate change	1	1	
Wst 06	Design for disassembly and adaptability	2	2	
	Waste Totals: (+exemplary)	**10 (+3)**	**7**	
	Waste weighting totals:	**6%**	**4.19%**	
Land Use & Ecology				
LE 01	Site selection	2	1	
LE 02	Identifying and understanding the risks and opportunities for the site	2	2	
LE 03	Managing negative impacts on ecology	3	2	
LE 04	Enhancement of Ecological value	4	2	
LE 05	Long term management and maintenance	2	2	
	Land Use & Ecology Totals: (+exemplary)	**13 (+1)**	**9**	
	Land Use & Ecology weighting totals:	**13%**	**9%**	
Pollution				
Pol 01	Impact of refrigerants	3	3	
Pol 02	Local air quality	2	2	
Pol 03	Flood and surface water management	5	3	
Pol 04	Reduction of night time light pollution	1	1	
Pol 05	Reduction of noise pollution	1	1	
	Pollution Totals: (+exemplary)	**12**	**10**	
	Pollution weighting totals:	**8%**	**6.66%**	
Innovation				
AI	Approved Innovation	1	0	
	Innovation Totals: (+exemplary)	**1**	**0**	
	Innovation weighting totals:	**1**	**0**	
	OVERALL SCORE TOTALS:	**74**	**57.06%**	

*Team to review and advise any amendments

13 Appendix A BREEAM Minimum Standards

To achieve a BREEAM rating, the minimum percentage score (55%) must be achieved and the minimum standards applicable to that rating level (refer to the table below) must be complied with. The 'Very Good' related credits are highlighted, issues which cannot be compromised within the scope of the development.

Minimum BREEAM standards by rating level Minimum standards by BREEAM rating level					
BREEAM Issue	PASS	GOOD	VERY GOOD	EXCELLENT	OUTSTANDING
Man 03: Responsible Construction Practices	None	None	None	One credit (Considerate Construction)	Two credits (Considerate Construction)
Man 04: Commissioning and Handover	None	None	None	Criterion 10 (Building User Guide)	Criterion 10 (Building User Guide)
Man 05: Aftercare	None	None	None	One Credit (Seasonal Commissioning)	One Credit (Seasonal Commissioning)
Ene 01: Reduction of Energy Use and Carbon Emissions	None	None	None	Five credits	Eight credits
Ene 02: Energy Monitoring	None	None	One Credit (First Sub-metering Credit)	One Credit (First Sub-Metering Credit)	One Credit (First Sub-Metering Credit)
Wat 01: Water Consumption	None	One credit	One credit	One credit	Two credits
Wat 02: Water Monitoring	None	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Mat 03: Responsible Sourcing of Materials	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Wst 01: Construction Waste Management	None	None	None	None	One credit
Wst 03: Operational Waste	None	None	None	One credit	One credit

14 Appendix B Main Contractor Responsibilities

The BREEAM New Construction V6 pre-assessment credit spreadsheet contained in Section 12 provides a summary of the key responsibilities and requirements of each BREEAM credit being attempted and should be consulted when assessing the input required from the main contractor and their team. All documentary evidence shall be provided to the BREEAM assessor on request during design, construction and upon practical completion.

The main contractor and their sub-contractors must ensure that all credits targeted within the pre-assessment document are achieved and that their responsibilities relating to the BREEAM elements of the tender documentation package are met in line with the BREEAM criteria.

The following table lists the BREEAM credits targeted by the project team that will require commitment and input from the appointed main contractor and their team. The main contractor responsibilities identified in this section are items which may not be fully covered within the other tender documentation issued by the design team. For full details of those credits requiring input from the main contractor please refer to Appendix A: Main Contractor Responsibilities and Appendix B: BREEAM New Construction V6 manual, Issue 2.0.

It is important to note that it is the responsibility of the main contractor and associated sub-contractors to ensure that each credit targeted by the design team is implemented at the construction phase of the project. Where there is apparent discrepancy within the tender documentation relating to credits targeted within the BREEAM tender report, the main contractor should seek clarification from the design team.

The credits Man04, Ene02, Wat01, Wat02 and Mat03 refer to 'mandatory' issues which must be achieved in order to attain the 'Very Good' rating.

Credit Summary: BREEAM New Construction 2018			Credit title	Actions required to secure the points given in the assessment (Summary Comments)
Management Credits				
Principal Contractor	Man 03	Responsible Construction Practices	Timber Procurement	Ensure all timber and timber based products used on the project are 'Legally harvested and traded timber'.
Principal Contractor			Environmental Management	Operate with an EMS certificate and implement best practice pollution prevention policies and procedures on site in accordance with PPG 6.
Principal Contractor			Considerate Construction	Register with the Considerate Constructors Scheme and achieve a score of not less than 35 with a score of at least 7 within each of the five sections.
Principal Contractor			Monitoring of Construction Site Impacts	Meter, target and record site energy (kWh) and water (m3) consumption resulting from the use of construction plant, equipment (mobile and fixed) and site accommodation, and transport movements and impacts resulting from the delivery and construction materials to site and construction waste from site.
Principal Contractor & Mechanical & Electrical Contractor	Man 04	Commissioning and Handover	Commissioning and Testing Schedule and Responsibilities	Appointment of a commissioning manager to monitor and review/programme/manage the design, pre-commissioning, commissioning and re-commissioning in line with Building Regulations/BSRIA/CIBSE guidelines
Principal Contractor & Mechanical & Electrical Contractor			Commissioning Building Services	Appointment of specialist commissioning agents for the complex systems, including BMS, where relevant.
Principal Contractor			Handover	Compile a fully compliant BREEAM Building User Guide (BUG) relevant to both the general user and non-technical facilities management and produce a schedule of training for relevant building occupiers in line with the BREEAM requirements.

Management Credits				
Principal Contractor & Mechanical & Electrical Contractor	Man 05	Aftercare	Aftercare Support	Provide aftercare training and support for all building occupiers, including introduction to aftercare team and BUG, walk around and training for the facilities manager, weekly site attendance for one month post-handover and longer term aftercare i.e. helpline for 12 months of occupation.
Mechanical & Electrical Contractor			Seasonal Commissioning	Seasonal commissioning is completed over the first year, post-handover.
Health and Wellbeing Credits				
Electrical Contractor	Hea 01	Visual Comfort	Internal and External Lighting Levels, Zoning and Control	Ensure all fluorescent and compact fluorescent lamps are installed with high frequency ballasts/control gear, all internal lighting is designed in accordance with the SLL Code for Lighting 2012 and LG 7 and external lighting in accordance with BS 5489-1: 2013 and BS EN 12464-2: 2014. Ensure zoning of all lighting allows for varying occupancy, with separate occupant control per lighting zone.
Principal Contractor & Mechanical Contractor	Hea 02	Indoor Air Quality	Indoor Air Quality Plan	Production of an Indoor Air Quality plan, which considers: the removal of contaminant sources; dilution and control of contaminant sources; procedures for pre-occupancy flush out; 3rd party testing and analysis and maintaining indoor air quality in use.
Principal Contractor			VOC Emission Level (products)	Ensure all fittings and finishes within the building have low emissions of Volatile Organic Compounds (VOC's) in line with the relevant standards.
Mechanical Contractor	Hea 04	Thermal Comfort	Thermal Modelling	Production of a CIBSE AM11 compliant fully dynamic thermal model in line with CIBSE Guide A & TM52.
Mechanical Contractor			Thermal Zoning and Controls	Production of a temperature control strategy, informed by the thermal modelling, to ensure appropriate occupant controls throughout the building.
Energy Credits				
Principal Contractor	Ene 01	Reduction of Energy Use and Carbon Emissions	Reduction of Energy Use and Carbon Emissions	Carry out energy modelling using approved building energy calculation software to produce a Building Regulations Output document based on the 'As built' stage of analysis.
Mechanical & Electrical Contractor	Ene 02	Energy Metering	Sub-metering of Major Energy Consuming Systems	Installation and labelling of separate sub-meters to enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end use categories.
Mechanical & Electrical Contractor			Sub-metering of High Energy Load and Tenancy Areas	Installation and labelling of separate sub-meters per tenancy/function areas present.
Electrical Contractor	Ene 03	External Lighting	External Lighting	Ensure the average luminous efficacy for external light fittings is not less than 60 lumens per circuit Watt, and is controlled via time clock and photocell with presence detection in areas of intermittent pedestrian traffic.
Principal Contractor	Ene 04	Low Carbon Design	Passive Design Analysis	Ensure the installation of passive design measures in line with the recommendations of the passive design analysis.
Principal Contractor	Ene 06	Energy Efficient Transportation Systems	Energy Consumption	Carry out a transport analysis and a comparison of two energy efficient lifts in accordance with the relevant standards, with the lowest energy consuming lift specified.
Principal Contractor			Energy Efficient Features	Ensure the energy efficient features defined by BREEAM are specified.

Transport Credits				
Principal Contractor & Electrical Contractor	Tra 03	Cyclist Facilities	Cycle Storage	Ensure the installation of 1 no. compliant cycle storage space per 10 building occupants (staff). Ensure lighting of cycle racks is in accordance with the criteria defined in BREEAM issue Hea 01 and is controlled to avoid 'out-of-hours' use and operation during daylight hours.
Principal Contractor	Tra 05	Travel Plan	Travel Plan	Ensure the installation of any physical recommendations made by the Travel Plan.
Water Credits				
Principal Contractor & Mechanical Contractor	Wat 01	Water Consumption	Water Consumption	Ensure the installation of low water use WC's, urinals, taps (wash hand basin and kitchen), showers and domestic/commercial scale appliances.
Mechanical Contractor	Wat 02	Water Monitoring	Water Monitoring	Ensure the installation of a pulsed-output water meter on the mains incoming water supply. Any water consuming plant or building areas responsible for 10% or more of the building's total water demand shall be fitted with separate sub-meters.
Mechanical Contractor	Wat 03	Water Leak Detection and Prevention	Leak Detection System	Ensure the installation of a BREEAM compliant water leak detection system covering the mains water supply within the building and between the building and the site boundary.
Mechanical Contractor			Flow Control Devices	Ensure the installation of flow control devices i.e. solenoid valves connected to PIR detectors, covering the cold water supply to each WC area/facility.
Materials Credits				
Principal Contractor	Mat 01	Life Cycle Impacts	Life Cycle Impacts	Ensure that building elements are BRE Green Guide A/A+ rated, in line with the architectural preliminaries.
Principal Contractor	Mat 03	Responsible Sourcing of Materials	Timber Procurement	Ensure all timber and timber based products used on the project are 'Legally harvested and traded timber'.
Principal Contractor			Sustainable Procurement Plan	Production of a Sustainable Procurement Plan, which provides a clear framework for the responsible sourcing of materials covering the minimum content as defined by BREEAM.
Principal Contractor			Responsible Sourcing of Materials	Ensure materials used to construct the main building elements are sourced from manufacturers with appropriate EMS certification.
Principal Contractor & Mechanical Contractor	Mat 04	Insulation	Insulation	Ensure that insulation products used for the external walls, ground floor, roof and building services are BRE Green Guide A/A+ rated.
Principal Contractor	Mat 05	Designing for Durability and Resilience	Protecting Vulnerable Parts of the Building from Damage	Ensure the implementation of the durability/protection measures against vulnerable areas (internally and externally) of the development.
Principal Contractor			Protecting Exposed Parts of the Building from Material Degradation	Ensure the implementation of protection measures to limit material degradation.
Waste Credits				
Principal Contractor	Wst 01	Construction Waste Management	Construction Resource Efficiency	Produce a BREEAM Site Waste Management Plan and ensure that construction waste generated is restricted to ≤11.1 tonnes / 13.3m3 per 100m2 gross internal floor area.
Principal Contractor			Diversion of Resources from Landfill	Ensure at least 80% (by weight) or 70% (by volume) of non-hazardous construction waste is diverted from landfill.

Waste Credits				
Principal Contractor & Mechanical Contractor	Wst 03	Operational Waste	Operational Waste	Ensure the installation of a recyclable waste storage area, in addition to the general waste storage area, of at least 10m2 for buildings ≥5000m2 net floor area. All facilities must be labelled and adequately sized. Ensure the installation of a compactor/baler and/or composting vessel with water outlet, where appropriate.
Land Use and Ecology Credits				
Principal Contractor	LE 02	Ecological Value of Site and Protection of Ecological Features	Protection of Ecological Features	Appointment of a 'Suitably Qualified Ecologist' to conduct a site survey prior to the commencement of activities on site. Ensure the protection of any ecological features identified in the ecologist's report.
Principal Contractor	LE 03	Minimising Impact on Existing Site Ecology	Change in Ecological Value	Appointment of a 'Suitably Qualified Ecologist' to conduct a site survey prior to the commencement of activities on site. Ensure planting is carried out on site in line with the proposed planting scheme and recommendations made by the ecologist.
Principal Contractor	LE 04	Enhancing Site Ecology	Ecologist's Report and Recommendations	Appointment of a 'Suitably Qualified Ecologist' to conduct a site survey prior to the commencement of activities on site. Ensure that the ecologist's recommendations are implemented in the landscaping scheme and any ecological features are protected.
Principal Contractor	LE 05	Long Term Impact on Biodiversity	Long Term Impact on Biodiversity	Appointment of a 'Suitably Qualified Ecologist' to conduct a site survey prior to the commencement of activities on site. Ensure that the additional biodiversity criteria are implemented on site as recommended by the ecologist.
Pollution Credits				
Principal Contractor	Pol 03	Surface Water Run-Off	Surface Water Run-Off and Prevention of Flooding	Ensure the installation of attenuation measures as per the drainage design and Flood Risk Assessment.
Electrical Contractor	Pol 04	Reduction of Night Time Light Pollution	Reduction of Night Time Light Pollution	Ensure the installation of external lighting in accordance with the Table 2 of the ILP Guidance notes, and automatic control to enable lighting to automatically switch off between 23.00hr and 07.00hr.
Principal Contractor	Pol 05	Reduction of Noise Pollution	Reduction of Noise Pollution	Appointment of a 'Suitably Qualified Acoustician' to carry out a noise impact assessment in line with BS 7445, with attenuation measures installed where necessary.
Innovation Credits				
Exemplary Credits				

MANAGEMENT

MAN 03: Responsible Construction Practices

Timber Procurement

The main contractor shall procure 'Legally harvested and traded timber' during construction, including formwork, site hoardings and other temporary site timber used for the purpose of facilitating construction.

BREEAM follows the UK Government's definition of legally sourced timer, as outlined in the Central Point of Expertise on Timber (CPET) 5th Edition report on the UK Government's Timber Procurement Policy. Further information in the UK Government's Timber Procurement Policy and compliant responsible sourcing certification schemes is available from the CPET (Central Point of Expertise on Timber) website: www.cpet.org.uk/

Manufacturer's details and timber certification shall be provided in order to demonstrate compliance.

Environmental Management

The main contractor shall operate an Environmental Management System covering their main operations. The EMS must be either:-

- Third party certified, to ISO14001/EMAS or equivalent standard;

OR

- The structure of the EMS is in compliance with British Standard 8555 2003 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system', and completed phase audits one to four, as defined in BS 8555.

The main contractor shall take all appropriate measures to avoid nuisance arising from dust or fumes, or any other airborne pollutants and watercourse pollutants, and shall adopt best practice prevention policies and procedures on site in accordance with Pollution Prevention Guidelines, Working at construction and demolition site: PPG 6.

The main contractor shall disseminate all best practice above to all relevant site operatives through induction and tool-box talks during site activities.

Considerate Construction

The main contractor shall register with and achieve formal certification under the Considerate Constructors Scheme (CCS).

Credits are awarded as follows:

- One credit where the contractor has achieved a CCS Code of Considerate Practice score of not less than 35 with a minimum of 7 achieved in each of the 5 sections.

The scope of the CCS assessment will cover the whole of the construction works including any site clearance and demolition.

Credits will be based on the final visit and subsequent Monitor's Site Report and certified CCS score.

Utility Consumption

Energy and Water Consumption

Monthly measurements of energy consumption per fuel type (kWh) from the use of construction plant, equipment (mobile and fixed) and site accommodation shall be recorded and displayed on site. The total energy consumption must be reported per fuel type (total kWh and kWh/£100k project value) and carbon dioxide emissions (total kgCO2eq, and kgCO2eq/£100k project value).

Monthly measurements of water consumption (m3) from the use of construction plant, equipment (mobile and fixed) and site accommodation shall be recorded and displayed on site. The total net water consumption must be reported, minus any recycled water use.

Appropriate target levels of monthly energy and water consumption are set. These should be set using 'Constructing Excellence' KPI benchmarks.

As a minimum monitoring will include checking the meters and displaying some form of graphical analysis in the site office to show consumption over the project duration and how actual consumption compares to the targets set.

The design/site management team will nominate an individual who will be responsible for the monitoring and collection of data throughout the build programme.

The data must be produced in an acceptable format for the BREEAM assessor to include within the BREEAM scoring and reporting tool.

Transport of Construction Materials and Waste

Transport movements and impacts resulting from the delivery of construction materials from the factory gate to the building site, including any transport, intermediate storage and distribution are recorded at least monthly during the entire construction period.

The monitoring must cover the materials used in major building elements (i.e. those defined in BREEAM issue Mat 01 Life Cycle Impacts), including insulation materials, and ground works and landscaping materials.

Transport movements and impacts resulting from the removal of construction waste from the construction gate to waste disposal processing/recovery centre gate are recorded at least monthly during the entire construction period.

The monitoring must cover the construction waste groups outlined in the project's waste management plan.

The following information must be reported separately for both materials and waste and provided in an acceptable format for the BREEAM assessor to include within the BREEAM scoring and reporting tool:

- Total number of deliveries
- Total distance travelled for all deliveries (km)
- Total energy consumption (litres of fuel) from all deliveries
- Total greenhouse gas emissions (kgCO2eq) from all deliveries

MAN 04: Commissioning and Handover

Commissioning and Testing Schedule and Responsibilities

The main contractor shall produce a schedule of commissioning that identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and testing and inspecting fabric.

The schedule will identify the appropriate standards that all commissioning activities will be conducted in accordance with, such as current Building Regulations, BSRIA and CIBSE guidelines and/or other appropriate standards, where applicable.

Where a Building Management System (BMS) is specified, the following commissioning procedures shall be carried out:

1. Commissioning of air and water systems when all control devices are installed, wired and functional;
2. In addition to air and water flow results, commissioning results include physical measurements of room temperatures, off coil temperatures and other key parameters as appropriate;
3. The BMS/controls installation should be running in auto with satisfactory internal conditions prior to handover;
4. All BMS schematics and graphics are fully installed and functional to user interface before handover.
5. The occupier or facilities team is fully trained in the operation of the system.

A commissioning manager shall be appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning. The commissioning manager can be a person from the contractor or sub-contractor organisation provided they are not involved in the general installation works.

All building services shall be included in the commissioning schedule and commissioning shall be accounted for within the budget and main programme of works, allowing for the required time to complete all commissioning and testing activities prior to handover.

Commissioning Building Services

The main contractor shall appoint a specialist commissioning manager for complex systems such as:

- Air conditioning and comfort cooling;
- Mechanical ventilation, displacement ventilation and complex passive ventilation;
- Building management systems (BMS);
- Renewable energy sources;
- Microbiological safety cabinets and fumes cupboards;
- Cold storage enclosures and refrigeration plant.

The scope of their responsibility shall include:

a. Undertaking design reviews and giving advice on suitability for ease of commissioning;
b. Providing commissioning managing input to construction programming and during installation stages;
c. Management of commissioning, performance testing and handover/post-handover stages.

The commissioning manager is responsible for witnessing the commissioning of the complex systems.

Handover

Building User Information

The main contractor shall produce a Building User Guide for the building that is relevant to the non-technical building user and appropriate to the stakeholder(s) that will occupy the building. The list below indicates the type of information that should be included to meet the needs of the Facilities Management (FM) Team/Building Manager and the general users (staff). Note that the list is not exhaustive as the content of the guide will be specific to the building type.

The Building User Guide will be compiled by the main contractor as a standalone document, separate to the O&M manuals.

The Building User Guide will take the following format including each of the 12 section headings:

1. Overview of the building and its environmental strategy

The energy/water/waste efficiency strategy and how users should engage with/deliver the strategy. This should give owners and occupiers information on energy efficient features and strategies relating to the building, and also provide an overview of the reasons for their use, e.g. economic and environmental savings.

Staff - Information on the operation of innovative features such as automatic blinds, lighting systems etc., and guidance on the impacts of strategies covering window opening and the use of blinds, lighting and heating controls;

- Details of water saving features and their use and benefits, e.g. aerating taps, low flush toilets, leak detection, metering etc.

FM Team - As above, plus information on air tightness and solar gain (e.g. the impact of leaving windows/doors open in an air conditioned office, or use of blinds in winter with respect to solar gain);

- Energy targets and benchmarks for the building type, information on monitoring such as the metering and sub-metering strategy, and how to read record and present meter readings;

- Water use: details of main components (including controls) and operation. Recommendations for system maintenance and its importance, e.g. risk of legionella.

2. Building services overview and access to controls

Staff - Information on heating, cooling and ventilation in the building and how these can be adjusted, e.g. thermostat location and use, implications of covering heating outlets with files, bags etc., and use of lifts and security systems.

FM Team - As above, plus a non-technical summary of the operation and maintenance of the building systems (including BMS) and overview of controls.

3. Pre-arrival information for visitors e.g. access and security procedures/provisions

Information on the security and access arrangements for visitors to the facility, this might include company policies and procedures, accessible and non-accessible areas etc.

4. Provision and access to shared facilities

As above, including details of the shared facilities available.

5. Safety and Emergency Strategy

Staff - Include information on the location of fire exits, muster points, alarm systems and firefighting systems.

FM Team - As above, plus details of location and nature of emergency and firefighting systems, nearest emergency services, location of first aid equipment, non-technical details of the fire alarm system and sprinkler systems.

6. Building related operational procedures specific to building type/operation

Staff - Information for the general building users on features specific to the facility environment, this might include company policy information on use of the building and other appropriate information on the operational procedures within the facility.

FM Team - This section might include the above, plus information on specific features installed to the facility and more detailed information on the operational interaction with the building services and systems.

7. Building related incident reporting/feedback arrangements

Staff - Information on reporting methods, procedures and contact personnel relating to feedback from staff regarding building related incidents.

FM Team - As above, plus details of building operation/services related incidents and external personnel contact details and company procedures for reporting building related incidents.

8. Building related training and information links

Details of the proposed content and suggested suppliers of any training and/or demonstrations in the use of the building's services, features and facilities that will be needed. This could include:

Staff - General training in the use of any innovative/energy saving features and any other related training relevant to the use of the building.

FM Team - As above, plus details of comprehensive training in services, systems, emergency procedures and setting up, adjusting, and fine tuning, the systems within the building.

9. Provision and access to transport facilities

Staff - Details of car parking and cycling provision; local public transport information, maps and timetables; information on alternative methods of transport to the workplace e.g. car sharing schemes; local 'green' transport facilities.

FM Team - As above, plus information on conditions of access, and appropriate use of car parking and cycling facilities e.g. number of spaces provided, site maintenance of cyclist facilities, pedestrian and car parking areas.

10. Provision of and access to local amenities

Staff - Information on the location of local amenities e.g. shops and local services and how to access them appropriately.

FM Team - As above, plus information on local services and supply chains used in the operation of the facility, recycling, including recyclable building/fit out components, waste storage and collection procedures.

11. Re-fit/refurbishment and maintenance arrangements/considerations

Staff - An explanation of the impact of re-positioning of furniture and the implications of layout change i.e. may cover grilles/outlets, implications of layout change, e.g. installation of screens, higher density occupation etc.

FM Team - As above, plus environmental recommendations for consideration in any refit. Relevant issues covered in BREEAM should be highlighted, e.g. the use of natural ventilation, use of Green Guide 'A' rated materials, re-use of other materials etc., the potential impact of increasing occupancy and any provision made in the original design to accommodate future changes.

12. Links, references and relevant contact details

Staff - This should include links to other information including websites, publications and organisations. In particular, the 'Carbon Trust' programme should be referenced and links provided to its website also details of good practice guidance. Contact details of FM/manager, maintenance team, and/or help desk facility, and details of any building user groups if relevant.

FM Team - Energy saving links and references plus contact details of services manufacturer's details, mechanical and electrical sub-contractors (if appropriate).

Training Schedule

The main contractor must allow for and conduct a schedule of training identified for relevant building occupiers/premises managers, timed appropriately around handover and proposed occupation plans, which includes the following as a minimum:

a. The building's design intent;

b. The available aftercare provision and aftercare team main contact(s), including any scheduled seasonal commissioning and post occupancy evaluation;

c. Introduction to, and demonstration of, installed systems and key features, particularly building management systems, controls and their interfaces;

d. Introduction to the Building User Guide and other relevant documentation e.g. design data, technical guides, maintenance strategy, operations and maintenance (O&M) manual, commissioning records, log book etc.;

e. Maintenance requirements, including any maintenance contracts and regimes in place.

MAN 05: Aftercare

Aftercare Support

The main contractor shall provide aftercare support to all building occupiers, which includes the following as a minimum:

a. A meeting (programmed to occur prior to initial operation, or as soon as possible thereafter) to:

    i. Introduce the aftercare team (or individual) to the aftercare support available, including the Building User Guide (where existing) and training schedule/content;

    ii. Present key information about how the building operates including the design intent and how to use the building to ensure it operates efficiently and effectively as possible.

b. Onsite training for the facilities management, including a walk around of the building and introduction to and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands;

c. Initial aftercare provision for at least the first month of building occupation e.g. on site attendance on a weekly basis to support building users and management;

d. Longer term aftercare support provision for occupants for at least the first 12 months from occupation e.g. a helpline, nominated individual or other appropriate system to support building users and management.

The main contractor shall allow for the collection of energy and water consumption data for at least 12 months after occupation, to analyse the actual values and the expected values to feed into the commissioning and seasonal commissioning process with a view of adjusting systems if they are not operating as expected/designed.

Seasonal Commissioning

The following seasonal commissioning responsibilities shall be completed over a minimum 12 month period, once the building becomes occupied:

<u>Complex systems – Specialist Commissioning Manager</u>

a. Testing of all building services under full load conditions, i.e. heating equipment in mid-winter, cooling/ventilation equipment in mid-summer, and under part load conditions (spring/autumn);

b. Where applicable, testing should also be carried out during periods of extreme (high or low) occupancy;

c. Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems;

d. Re-commissioning of the systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the O&M manuals.

Simple systems (naturally ventilated) – external consultant/facilities manager

a. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback;
b. Take all reasonable steps to re-commission systems following the review to take account of deficiencies identified and incorporate any relevant revisions in operation procedures into the O&M manuals.

HEA 02: Indoor Air Quality

Indoor Air Quality Plan

The main contractor shall produce an Indoor Air Quality (IAQ) plan, which considers:

a. Removal of contaminant sources;
b. Dilution and control of contaminant sources;
c. Procedures for pre-occupancy flush out;
d. 3rd party testing and analysis;
e. Maintaining indoor air quality in use.

Volatile Organic Compounds (VOC) Emission Levels (products)

The main contractor shall ensure that all finishes and fittings within the building have low emissions of Volatile Organic Compounds (VOCs), as confirmed by the product datasheets or manufacturer(s) in line with the architectural specification.

The main contractor shall obtain confirmation from the manufacturer(s) that all finishes and fittings have been tested against and meet the relevant standards outlined in the table below for VOC

Ref	Product	Requirements
A	**Paints and Varnishes**	
	Performance requirements	VOC content limit
	Compliant performance standard(s)	EU Directive 2004/42/CE ('Paints Directive)
	Compliant testing standard(s)	BS EN ISO 11890-2: 2013 – Paints and varnishes – Determination of VOC content, Part 2 – Gas Chromatographic method
	Manufacturer also to confirm	Paints to be fungal and algal resistant in wet areas e.g. bathrooms, kitchens, utility rooms
B	**Wood panels (including particle board, fibreboard including MDF, OSB, cement bonded particle board, plywood, solid wood panel and acoustic board)**	
	Option 1	
	Performance requirements	Formaldehyde E1 class
	Compliant performance standard(s)	BS EN 13986: 2004 Wood-based panels for use in construction – Characteristics evaluation of conformity and marking
	Compliant testing standard(s)	BS EN 717-1: 2004 Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method
	Manufacturer also to confirm	The absence of prohibited wood preservatives/biocides
	Option 2	
	Performance requirements	Formaldehyde level of 0.1 mg/m3
	Compliant testing standard(s)	1. BS EN ISO 16000-9:2006 Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method, OR 2. Standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources using environmental chambers, version 1.1 - Emission testing method for California Specification 01350, Californian Department for Public Health, 2010. Note: For either method the resultant emission/surface area obtained from the chamber test method must be extrapolated to predict what the emissions would be in a theoretical model room (as detailed in the standard) and this extrapolated emission rate compared with the required formaldehyde level of 0.1mg/m3.
	Manufacturer also to confirm	The absence of prohibited wood preservatives/biocides

Ref	Product	Requirements
C	**Timber structures (e.g. glue laminated timber)**	
	Option 1	
	requirements	Formaldehyde E1 class
	Compliant performance standard(s)	BS EN 14080: 2005 Timber structures – Glues laminated timber requirements
	Compliant testing standard(s)	BS EN 717-1: 2004 Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2
	Compliant testing standard(s)	As category B Option 2
D	**Wood flooring (e.g. parquet)**	
	Option 1	
	Performance requirements	Formaldehyde E1 class
	Compliant performance standard(s)	BS EN 14342: 2005 + A1: 2008 Wood flooring – Characteristics, evaluation of conformity and marking
	Compliant testing standard(s)	BS EN 717-1: 2004 Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2
	Compliant testing standard(s)	As category B Option 2
E	**Resilient textile and laminated floor coverings (e.g. vinyl. Linoleum, cork, rubber, carpet, laminated wood flooring)**	
	Option 1	
	Performance requirements	Formaldehyde E1 class
	Compliant performance standard(s)	BS EN 14041: 2006 Resilient, textile and laminate floor coverings – Essential characteristics
	Compliant testing standard(s)	BS EN 717-1: 2004 Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2
	Compliant testing standard(s)	As category B Option 2
F	**Suspended ceiling tiles**	
	Option 1	
	Performance requirements	Formaldehyde E1 class
	Compliant performance standard(s)	BS EN 13964: 2004 + A1: 2006 Suspended ceilings – Requirements and test methods
	Compliant testing standard(s)	BS EN 717-1: 2004 Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2
	Compliant testing standard(s)	As category B Option 2
G	**Flooring adhesives**	
	Performance requirements	Carcinogenic or sensitising volatile substances are substantially absent
	Compliant performance standard(s)	BS EN 13999-1:2013 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 1: General procedure

Ref	Product	Requirements
G (continued)	**Flooring adhesives**	
	Compliant testing standard(s)	1. BS EN 13999-1:2013 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 1: General procedure 2. BS EN 13999-2:2013 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 2: Determination of volatile organic compounds 3. BS EN 13999-3:2007+A1:2009 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 3: Determination of volatile aldehydes 4. BS EN 13999-4:2007+A1:2009 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 4: Determination of volatile diisocyanates
H	**Wall coverings**	
	Performance requirements	- Vinyl chloride monomer (VCM) content - Formaldehyde level - Migration of heavy metals
	Compliant performance standard(s)	1. BS EN 233:1999 Wallcoverings in roll form - Specification for finished wallpapers, wall vinyls and plastic wall coverings 2. BS EN 234:1997 Wallcoverings in roll form - Specification for wallcoverings for subsequent decoration 3. BS EN 259-1:2001 Wallcoverings in roll form - Heavy duty wallcoverings - Part 1: Specifications
	Compliant testing standard(s)	BS EN 12149:1998 – Wall coverings in roll form. Determination of migration of heavy metals and certain other elements, of vinyl chloride monomer and of formaldehyde release
Relevant standards - VOCs	All standards outlined in the table above are standards recognised across Europe and internationally for VOC content and testing. In instances where a product is not assessed against the listed European or International standard, it is acceptable to use an alternative, nationally recognised, standard provided the following is met as a minimum: 1. The performance level requirements required by the alternative standard are equivalent to or better than those specified in the standards in the table above. For example, if a material containing formaldehyde has been added to the floor covering product as part of the production process, then the E1 emission measured for formaldehyde must be less than 0.124mg/m3 (as required by BS EN 14041:2004). 2. Where an alternative standard omits evaluation of a particular material, it is only acceptable to use the alternative standard in instances where the product does not contain that particular material.	
Products with no formaldehyde containing materials	For some floor coverings and wood-based panels, the requirement for formaldehyde testing (referred to in the above criteria) does not apply to "floor coverings to which no formaldehyde-containing materials were added during production or post-production processing", or in the case of EN 13986:2004, wood-based panels. As such, if a product manufacturer confirms that they have made a declaration of formaldehyde class E1 without testing (in writing or via a company product fact sheet or literature) then the product in question meets the BREEAM requirement relevant to formaldehyde testing. A declaration of E1 without testing is effectively confirmation from the manufacturer that formaldehyde emissions comply with the emission level requirements of the relevant standard(s) and therefore, evidence confirming the actual emission level(s) via testing will not be required by the assessor to demonstrate compliance with that particular requirement.	

ENERGY

ENE 01: Reduction of Energy Use and Carbon Emissions

Building energy modelling shall be compliant with the National Calculation Method (NCM) and carried out by an Accredited Energy Assessor using approved building energy calculation software to produce a Building Regulation Output document, resulting in a performance improvement better than the notional building level (as defined by the 2013 version of the Building Regulations, Part L2a).

Note that the draft BRUKL and EPC certificates confirm that an achievement of 6 No.(+4) BREEAM credits. The Main Contractor shall ensure that the energy modelling and subsequent final BRUKL and EPC certificates achieve the equivalent, or better, of the 6 No. credits allocated.

A copy of the Building Regulations Output document from the approved software reflecting the 'As built' stage of analysis shall be provided.

ENE 02: Energy Monitoring

The main contractor shall ensure that each energy sub-meter is labelled with the end consuming use prior to the assessor's final site inspection.

ENE 04: Low Carbon Design

Passive Design

The passive design measures recommended in the passive design analysis shall be installed on site.

The passive design measures result in a meaningful reduction in the total building energy demand of at least 5%.

Low and Zero Carbon Technologies

The low and zero carbon technologies recommended in the LZC feasibility study shall be installed on site.

The installed low and zero carbon technologies result in a meaningful reduction in the total carbon dioxide (CO2) emissions of at least 5%.

ENE 06: Energy Efficient Transportation Systems

Energy Consumption

The main contractor shall carry out an analysis of the transportation demand and usage patterns for the building to determine the optimum number and size of lift(s) required, including counterbalancing ratio.

The energy consumption shall be calculated in accordance with BS EN ISO 25745 Energy performance of lifts, escalators and moving walks, Part 2: Energy calculation and classification for lifts (elevators) and/or Part 3 – Energy calculation and classification for escalators and moving walks, for one of the following:

i. At least two types of system (for each transportation type required), OR;

ii. An arrangement of systems (e.g. for lifts, hydraulic, traction, machine room-less lift (MRL)), OR;

iii. A system strategy which is 'fit for purpose'.

The lift strategy with the lowest energy consumption shall be specified.

Energy Efficient Features

For each lift the following three energy efficient features shall be specified:

a. The lifts operate in stand-by condition during off-peak periods. For example, the power side of the lift controller and other operating equipment such as lift car lighting, user displays and ventilation fans switch off when the lift has been idle for a prescribed length of time;

b. The lift car lighting and display lighting provides an average lamp efficacy (across all fittings in the car) of >55 lamp lumens/circuit Watt;

c. The lift car uses a drive controller capable of variable-speed, variable-voltage, and variable-frequency (VVVF) control of the driver.

Where the use of regenerative drives is demonstrated to save energy, they are specified.

TRANSPORT

TRA 03: Cyclist Facilities

Cycle Storage

The main contractor shall ensure adequate cyclist storage facilities are installed, as follows:

- 1 no. compliant cycle storage space per 10 building occupants (staff).

Compliant cycle storage spaces are defined as those that meet the following:

a. Cycles can be secured within spaces in rack(s).They are covered overhead and the cycle racks are set in or fixed to a permanent structure (building or hard-standing). Alternatively the cycle storage may be located in a locked structure fixed to or part of a permanent structure with appropriate surveillance.

b. The distance between each cycle rack, and cycle racks and other obstructions, e.g. a wall, allows for appropriate access to the cycle storage space, to enable bikes to be easily stored and accessed.

c. The storage facility or entrance to the facility is in a prominent site location that is viewable/overlooked from either an occupied building or a main access to a building.

d. The cycle storage facility has adequate lighting, this could be demonstrated with the lighting criteria defined in BREEAM issue Hea 01 Visual comfort. 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.

TRA 05: Travel Plan

The main contractor shall implement and install any physical recommendations outlined in the Travel Plan.

WATER

WAT 01: Water Consumption

The main contractor shall ensure the installation of low water consuming sanitary ware to ensure at least a 25% improvement on potable water consumption (litres/person/day).

The efficiency of the following 'domestic scale' water consuming components shall be accounted for:

- WC's
- Urinals
- Taps (wash hand basins, kitchen taps and pre-rinse nozzles)
- Showers
- Dishwashers

Water consumption figures shall be collected from manufacturers' product information to determine the consumption of each type and specification of domestic and commercial scale water consuming component required, as follows:

- WCs: actual maximum or, where dual flush, effective flush volume in litres/use;
- Urinals: flush volume in litres/use for single use flush urinals. For cistern fed systems, the flushing frequency/hour and cistern capacity in litres;
- Taps: flow rate of each tap, at full flow rate in litres per minute measured at a dynamic pressure of 3±0.2 bar (0.3±0.02 MPa) for high pressure (type 1) taps, or at a dynamic pressure of 0.1±0.02 bar (0.01±0.002 MPa) for low pressure (type 2) taps (BS EN 200:2008, sanitary tapware, single taps and combination taps for supply systems of type 1 and 2 general specifications) including any reductions achieved with flow restrictions;
- Kitchen taps: maximum flow rate litres/min;
- Showers: flow rate of each shower at the outlet using cold water (T 30 C), in litres per minute measured at a dynamic pressure of 3±0.2 bar (0.3±0.02 MPa) for high pressure (Type 1) supply systems, or at a dynamic pressure of 0.1±0.05 bar (0.01±0.005 MPa) for low pressure (Type 2) supply systems (BS EN 1112:2008, Sanitary tapware. Shower outlets for sanitary tapware for water supply systems type 1 and 2. General technical specifications);
- Dishwashers: litres/cycle for domestic applications and/or appliances.

The maximum levels for each sanitary fitting shall be as follows:

- WC's – maximum effective flush volume of 3.75 litre (dual flush)
- Urinals – 3 litres/bowl/hour (2 or more urinals), or 4 litres/bowl/hour (1 urinal only)
- Wash hand basin taps – 3.5 litres/min
- Kitchen tap – 5 litres/min (kitchenette), or 6.3 litres/min (pre-rinse nozzles only)
- Showers – 8 litres/min
- Dishwashers – 11 litres/cycle (domestic sized).

WAT 02: Water Monitoring

The main contractor shall ensure the installation of a water meter on the mains incoming supply to the building. The water meter(s) shall have a pulsed output to enable connection to a BMS (or future connection) for the monitoring of water consumption.

Any water consuming plant or building areas consuming 10% or more of the building's total water demand shall be fitted with water sub-meters.

WAT 03: Water Leak Detection

Leak Detection System

A leak detection system shall be installed which is capable of detecting a major leak on the mains water supply within the building and between the building and the utilities water meter.

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.

Flow Control Devices

In addition, the main contractor shall ensure the installation of flow control devices that regulate the supply of water to each WC area/facility according to demand.

The following could be considered as types of flow control devices:

a. A time controller, i.e. an automatic time switch device to switch off the water supply after a predetermined interval A programmed time controller, i.e. an automatic time switch device to switch water on and/or off at predetermined times;

b. A volume controller, i.e. an automatic control device to turn off the water supply once the maximum pre-set volume is reached;

c. A presence detector and controller, i.e. an automatic device detecting occupancy or movement in an area to switch water on and turn it off when the presence is removed;

d. A central control unit, i.e. a dedicated computer-based control unit for an overall managed water control system, utilising some or all of the types of control elements listed above.

MATERIALS

MAT 01: Life Cycle Impacts

All materials within the following building elements shall have an A or A+ rating as defined in the latest edition of the BRE 'Green Guide to Specification':

- External walls
- Roof

See http://www.thegreenguide.org.uk

New users can register and access this free facility online.

In this respect, the main contractor must not deviate from the constructions and materials specified in the NBS.

MAT 03: Responsible Sourcing of Materials

Timber Procurement

The main contractor shall procure 'Legally harvested and traded timber' during construction, including formwork, site hoardings and other temporary site timber used for the purpose of facilitating construction.

BREEAM follows the UK Government's definition of legally sourced timer, as outlined in the Central Point of Expertise on Timber (CPET) 5th Edition report on the UK Government's Timber Procurement Policy. Further information in the UK Government's Timber Procurement Policy and compliant responsible sourcing certification schemes is available from the CPET (Central Point of Expertise on Timber) website: www.cpet.org.uk/

Manufacturer's details and timber certification shall be provided in order to demonstrate compliance.

Sustainable Procurement Plan

The main contractor shall source materials for the project in accordance with a documented sustainable procurement plan.

The sustainable procurement plan shall set out a clear framework for the responsible sourcing of materials to guide the specification and procurement of construction materials throughout the project. The plan shall be prepared at either organisational level or be site/project specific for the purpose of the BREEAM assessment, and shall cover the following as a minimum:

1. Risks and opportunities are identified against a broad range of social, environmental and economic issues. BS 8902: 2009 Responsible sourcing sector certification schemes for construction products – Specification can be used as a guide to identify these issues.
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 where possible.
4. Procedures are in place to check and verify the sustainable procurement plan is being implemented/adhered to on individual projects. These could include setting out measurement criteria, methodology and performance indicators to assess progress and demonstrate success.

Responsible Sourcing of Materials

In order to fulfil the requirements of BREEAM for the project, the main contractor will ensure that the materials in the following building elements will be procured from 'responsible' sources where possible:

1. Ceiling (including ceiling finishes)
2. Door/window
3. Floor (including floor finishes)
4. Insulation
5. Internal partition/internal walls (including finishes)
6. Roof (including roof finishes)
7. Structure (primary and secondary)
8. External wall (e.g. cladding, lining, render, including finishes)
9. Building service
10. Hard landscaping
11. Other

Any material type within a location/use category defined above, other than ceiling and internal partitions/internal walls, which clearly accounts for less than 1m3 per 1000m2 of gross internal floor area can be excluded. Fixings, adhesives, many finishing material (but not all) and ironmongery would fall below this threshold.

Any material type within ceiling and internal partitions/internal walls location/use categories which clearly account for less than 0.33m3 per 1000m2 of gross internal floor area can be excluded.

The following applicable materials comprising the building elements listed above shall be responsibly sourced where possible.

1. Timber/timber based products (TBP)
2. Concrete/cementitious (plaster, mortar, screed etc.)
3. Metal
4. Stone/aggregate
5. Clay-based (pavers, blocks, bricks, roof tiles etc.)
6. Gypsum
7. Glass
8. Plastic, polymer, resin, paint, chemicals and bituminous
9. Animal fibre/skin, cellulose fibre
10. Other

All applicable materials shall be covered by appropriate and compliant BREEAM recognised environmental management or Responsible Sourcing Certification (RSC) Schemes that have as a minimum demonstrated compliance with the mandatory requirements and evaluation criteria as defined by BREEAM.

For materials that demonstrate responsible sourcing, the following certification schemes comply with BREEAM:

- BRE Global, BES 6001 – Framework Standard for Responsible Sourcing
- CARES Sustainable Construction Steel (SCS) Scheme
- Eco-reinforcement
- Forest Stewardship Council (FSC)
- Programme for the Endorsement of Forest Certification (PEFC)
- Sustainable Forestry Initiative (SFI)

Independently certified Environmental Management Systems (EMS) are also recognised to a limited degree as they partially comply with BREEAM's evaluation criteria for RSC schemes. These include:

- ISO 14001
- EMAS (Eco Management and Audit Scheme)

The main contractor shall ensure that the EMS certificate for each material covers both the Key Process and Supply Chain, as defined in the table below:

Key Process – The final major aspects of processing that are carried out for the product/material in question. There may be a single process or multiple processes requiring assessment, depending on the end product.

Supply Chain EMS – Supply chain EMS covers all the major aspects of processing and extraction involved in the supply chain for the end product. Note that recycled materials are not required to demonstrate a Supply Chain EMS. If the EMS certification is provided for the Key Processes for recycled materials, this is assumed by default.

Material Category	Key Process	Key Supply Chain Processes
Timber/timber based		
Virgin timber	Timber from certified sources	Timber from certified sources
Wood panel and wood based composite products such as Oriented Strand Board, plywood, HPL, chipboard/particle, glulam, LVL, etc.	Wood products, including those with recycled content, can only use the timber certification route	
Concrete/Cementitious		
In-situ concrete (including ready mix and cementitious mortars and renders)	Ready mix concrete plant	Cement production Aggregate extraction and production
Precast concrete and other concrete products (including blocks, cladding, precast flooring, concrete or cementitious roof tiles)	Concrete product manufacture	Cement production Aggregate extraction and production
Plasterboard and plaster	Plasterboard or plaster manufacture	Gypsum extraction Synthetic gypsum (from flue gas desulphurisation) by default (recycled content)
Cement Bonded Particle Board	Due to the significant cement content, in addition to requiring timber certification, the key supply chain process must also be considered to obtain the relevant point score Timber from certified sources	Cement production Timber from certified sources
Metals		
Metals (steel, aluminium, etc.)	Metal product manufacture – e.g. cladding production, steel section production	Metal production: Steel: electric arc furnace or Basic oxygen furnace process Aluminium: ingot production Copper: ingot or cathode production
Stone		
Dressed or building stone (including slate)	Stone product manufacture	Stone extraction
Clay-based		
Brick (including clay tiles and other ceramics)	Product manufacture	Clay extraction
Glass		
Glass	Glass production	Sand extraction Soda ash production or extraction
Plastic, polymer, resin, paint, chemicals and bituminous		
Plastics and rubbers (including polymeric renders, EPDM, TPO, PVC and VET roofing membranes)	Plastic/rubber product manufacture	Main polymer production
Resin-based composites and materials (including GRP and polymeric render but excluding timber based composites)	Composite product manufacture	Glass fibre production (or other principle matrix material) Polymer production
Bituminous materials, such as roofing membranes and asphalt	Product manufacture	Bitumen production Aggregate extraction and production
Insulation		
Foam insulation	Insulation manufacture	Principal polymer production e.g. polystyrene, MDI, phenolic resin or equivalent
Stone wool, glass & cellular glass insulation made using <50% recycled input	Product manufacture	Any quarried or mined material over 20% of input
Wool	Product manufacture	Wool scouring
Products using >50% recycled content, except those using timber	Product manufacture	Recycled content by default
Timber-based insulation materials including those using recycled timber	Product manufacture	Recycled timber by default, all other timber from one of the recognised timber certification schemes in BREEAM issue Mat 03
Other renewable-based insulation materials using agricultural by-products (e.g. straw)	Product manufacture	By-product manufacture by default

Material Category	Key Process	Key Supply Chain Processes
Other		
Other mineral-based materials, including fibre cement and calcium silicate	Product manufacture	Cement production Lime production Other mineral extraction and production
Products with 100% recycled content	Product manufacture	Recycled input by default
Product with lower % of recycled content	Product manufacture	Supply chain process/processes for any virgin material in the relevant product type above. Recycled input by default
Any other product	Key process is likely to be product manufacture	1 or 2 main inputs with significant production or extraction impacts should be identified
Excluded products: insulation, fixings, adhesives, additives	n/a	n/a
NOTE: where cement and aggregate, or dry mix concrete are mixed on site (i.e. not concrete previously certified as pre-cast concrete products or wet ready mix concrete), certification must cover the manufacture of the cement and primary process, and the extraction of the aggregate and limestone used to make cement as the supply chain process.		

MAT 05: Designing for Durability and Resilience

Protecting Vulnerable Parts of the Building from Damage

The main contractor shall ensure that all durability measures outlined in the design, both externally and internally, are installed.

Compliant durability measures include:

- Bollards/barriers/raised kerbs to delivery and vehicle drop-off areas;
- Robust external wall construction up to 2m high;
- Corridor walls specified to Severe Duty (SD) as per BS 5234-2;
- Protection rails to walls of corridors, where necessary;
- Kick plates/impact protection (from trolleys etc.) on doors;
- Hard-wearing and easily washable floor finishes in heavily used areas (including circulation areas, such as main entrance, corridors, public areas, etc.);
- Designing out the risk without the need for additional materials specification to protect vulnerable areas.

Protecting Exposed Parts of the Building from Material Degradation

The main contractor shall ensure that all protection measures outlined in the design, to limit material degradation due to environmental factors, are installed.

WASTE

WST 01: Construction Waste Management

A Resource Management Plan (RMP) shall be developed covering the non-hazardous waste related to on-site construction and dedicated off site manufacture or fabrication (including demolition and excavation waste), which covers the following:

1. The target benchmark for resource efficiency (m3 or tonnes of non-hazardous waste per 100m2);
2. Procedures and commitments for minimizing non-hazardous waste in line with the benchmark;
3. Procedures for minimizing hazardous waste;
4. A waste minimization target and details of waste minimization actions to be undertaken;
5. Procedures for estimating, monitoring, measuring and reporting hazardous and non-hazardous site waste. If waste data is obtained from licensed external waste contractors, the data must be reliable and verifiable e.g. by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms;
6. Procedures for sorting, reusing and recycling construction waste into defined waste groups (see below) either on site or through a licensed external contractor;
7. Procedures for reviewing and updating the plan;
8. The name or job title of the individual responsible for implementing the above;
9. The final total amount of non-hazardous construction waste (at practical completion);
10. The final resource efficiency (at practical completion).

The main contractor shall ensure that the amount of non-hazardous construction waste generated by the building's construction phase (excluding demolition and excavation waste) does not exceed 11.1 tonnes, or 13.3m3 per 100m2 of the gross internal floor area.

Diversion of Resources from Landfill

At least 80% (by weight) or 70% (by volume) of non-hazardous waste shall be diverted from landfill. Actions to avoid waste being disposed of in landfill include:

- Reusing the material on site (in-situ or for new applications);
- Reusing the material on other sites;
- Community reuse and recycling;
- Salvaging or reclaiming the material for reuse;
- Returning the material to the supplier via a 'take-back' scheme;
- Recovery of the material from site by an approved waste management contractor and recycled or sent for energy recovery.

Waste materials will be sorted into separate key waste groups (according to the waste streams generated by the scope of the works) either onsite or offsite through a licensed contractor for recovery.

The following table lists the compliant construction waste groups:

European Waste Catalogue	Key Group	Examples
170102	Bricks	Bricks
170101	Concrete	Pipes, kerb stones, paving slabs, concrete rubble, precast and in situ
170604	Insulation	Glass fibre, mineral wool, foamed plastic
1501	Packaging	Paint pots, pallets, cardboard, cable drums, wrapping bands, polythene sheets
170201	Timber	Softwood, hardwood, boards products such as plywood, chipboard, medium density fibreboard (MDF)
1602	Electrical and electronic equipment	Electrical & electronic TVs, fridges, air-conditioning units, lamps equipment
200301	Canteen/office	Office waste, canteen waste, vegetation
1301	Oils	Hydraulic oil, engine oil, lubricating oil
1703	Asphalt and tar	Bitumen, coal tars, asphalt
170103	Tiles and ceramics	Ceramic tiles, clay roof tiles, ceramic sanitary ware
1701	Inert	Mixed rubble/excavation material, glass
1704	Metals	Radiators, cables, wires, bars, sheet
170802	Gypsum	Plasterboard, render, plaster, cement, fibre cement sheets, mortar
170203	Plastics	Pipes, cladding, frames, non-packaging sheet
200307	Furniture	Tables, chairs, desks, sofas
1705	Soils	Soils, clays, sand, gravel, natural stone
Most relevant EWC	Liquids	Non-hazardous paints, thinners, timber treatments
Most relevant EWC	Hazardous	Defined in the Hazardous Waste List (HWL) of the European Waste Catalogue (EWC)
Most relevant EWC	Floor coverings (soft)	Carpets, vinyl flooring
Most relevant EWC	Architectural Features	Roof tiles, reclaimed bricks, fireplaces
170904 (Mixed)	Mixed/other	Efforts should be made to categorise waste into the above categories where possible

WST 03: Operational Waste

The main contractor shall install a dedicated recyclable waste storage area that is sized appropriately based on the estimated recyclable waste streams and volumes generated by the proposed building.

This shall be in addition to the general waste storage area.

Both the general and recyclable waste storage areas must be clearly labelled, of capacity appropriate to the building type, size, and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates and accessible to all building occupants/facilities operators.

The recyclable waste storage area must be a minimum of 2m2 per every 1000m2 for buildings <5000m2 net floor area.

Where the development is likely to produce a consistent generation in volume of operational waste streams such as large amounts of packaging and/or compostable waste, the main contractor shall also install a static waste compactor(s) or baler(s) and/or vessel for composting suitable organic waste.

Where organic waste is to be stored/composted on site, a water outlet shall be installed adjacent to or within the facility for cleaning and hygiene purposes.

LAND USE AND ECOLOGY

In relation to the following credits under this section, the Main Contractor is to appoint a 'Suitably Qualified Ecologist' (SQE) prior to the commencement of activities on site to carry out a Phase 1 Habitat Survey and compile an Ecology Report in line with the BREEAM requirements outlined below.

The Ecologist must have the following qualifications/experience:

- Holds a degree or equivalent qualification (e.g. N/SVQ level 5) in ecology or a related subject. Depending on the ecological content (minimum 60%), the following degrees may be considered relevant: Ecology, Biological Sciences, Zoology, Botany, Countryside Management, Environmental Sciences, Marine and Freshwater Management, Earth Sciences, Agriculture, Forestry, Geography, Landscape Management;
- Is a practising ecologist, with a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting ecology in relation to construction and the building environment, including acting in an advisory capacity to provide recommendations for ecological protection, enhancement and mitigation measures. Examples of relevant experience are: ecological impact assessments, Preliminary Ecological Appraisals (PEA); Phase 2 habitat and fauna surveys and habitat creation;
- Is covered by a professional code of conduct and subject to peer review. Full members of the following organisations, who meet the above criteria, are deemed Suitably Qualified Ecologists for the purpose of BREEAM:
    a. Chartered Institute of Water and Environment Management (CIWEM)
    b. Chartered Institute of Ecology and Environmental Management (CIEEM)
    c. Institute of Environmental Management and Assessment (IEMA)
    d. Landscape Institute (LI)
    e. The Institution of Environmental Sciences (IES);

Where a Suitably Qualified Ecologist is verifying an ecology report produced by an ecologist who does not meet the SQE criteria, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to:

a. Represent sound industry practice
b. Report and recommend correctly, truthfully and objectively
c. Be appropriate given the local site conditions and scope of works proposed
d. Avoid invalid, biased and exaggerated statements.

Additionally, written confirmation from the third party verifier that they comply with the SQE definition is required.

LE 02: Ecological Value of Site and Protection of Ecological Features

Protection of Ecological Features

The main contractor shall ensure that all existing features of ecological value surrounding the construction zone and site boundary area are adequately protected from damage during clearance, site preparation and construction activities in line with BS 42020: 2013. These include as a minimum:

1. Trees determined to be of value using one of the following measures:
    a. More than 10 years old (or where age is unknown the trunk diameter is over 100 mm)
    b. Tree of significant ecological value (as defined by BS 5837: 2012 and confirmed by the Suitably Qualified Ecologist or qualified arboriculturalist);
2. Hedges and natural areas requiring protection;
3. Watercourses and wetland areas;
4. Nesting or roosting opportunities for birds and bats within the building.

In all cases, the main contractor is required to construct ecological protection prior to any preliminary site construction or preparation works (e.g. clearing of the site or erection of temporary site facilities).

LE 03: Mitigating Impact on Existing Site Ecology

The main contractor shall ensure that planting is carried out on site in line with the proposed planting scheme and recommendations made by the ecologist to ensure that the ecological value of the site remains unchanged or is improved.

LE 04: Enhancing Site Ecology

Ecologist's Report and Recommendations

The main contractor shall ensure that the recommendations of the ecology report for the enhancement and protection of site ecology are implemented on site and that any ecological features are protected.

General recommendations for enhancing and protecting the ecological value of the site are to include, and go beyond, compliance criteria for all current UK and EU legislation relating to protected species and habitats.

Ecological recommendations are defined as measures adopted to enhance the ecology of the site. This may involve specific recommendations relating to the timing of works on site and may include:

1. The planting of locally appropriate native species or non-native species with a known attraction or benefit to local wildlife;
2. The adoption of horticultural good practice (e.g. no, or low, use of residual pesticides);
3. The installation of bird, bat and/or insect boxes at appropriate locations on the site;
4. Development of a full Biodiversity Management Plan including avoiding clearance/works at key times of the year (e.g. breeding seasons);
5. The proper integration, design and maintenance of Sustainable Drainage Systems (SUDS) (such as rain gardens), green roofs, green walls, community orchards, community allotments etc.

LE 05: Long Term Impact on Biodiversity

The main contractor shall ensure that a landscape and habitat management plan appropriate to the site is produced covering at least the first five years after project completion in accordance with BS 42020: 2013 Section 11.1. This shall be handed over to the building owner/occupants for use by the grounds maintenance staff and includes:

a. Description and evaluation of features to be managed;

b. Ecological trends and constraints on site that could influence management;

c. Aims and objectives of management;

d. Appropriate management options for achieving aims and objectives;

e. Prescriptions for management actions;

f. Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five year period);

g. Body or organisation personnel responsible for implementation of the plan;

h. Monitoring and remedial measures (see BS 42020: 2013 Section 11.2);

i. Funding resources and mechanisms to ensure sustainable long term delivery of the proposed management.

In addition, the main contractor shall adhere to the additional biodiversity measures during the construction phase of the project, as identified by the ecologist.

Ref	Additional measures for the improvement of long term biodiversity
1	The principal contractor nominates a Biodiversity Champion with the authority to site activities and ensure that detrimental impacts on site biodiversity are minimised in line with the recommendations of a Suitably Qualified Ecologist.
2	The principal contractor trains the site workforce on how to protect site ecology during the project. Specific training must be carried out for the entire site workforce to ensure they are aware of how to avoid damaging site ecology during operations on-site. Training should be based on the findings and recommendations for protection of ecological features highlighted within a report prepared by a Suitably Qualified Ecologist.
3	The principal contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of the construction process. The requirement commits the principal contractor to make such records available where publicly requested.
4	Where a new ecologically valuable habitat appropriate to the local area is created. This includes a habitat that supports nationally, regionally or locally important biodiversity, and/or which is nationally, regionally or locally important itself; including any UK Biodiversity Action Plan (UK BAP) priority habitats, Local Biodiversity Action Plan (LBAP) habitats, those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans. Local biodiversity expertise should be sought during the Preparation and Brief (RIBA Stage 1 or equivalent) to help identify species of local biodiversity importance on-site and ensure that the proposals support local priorities.
5	Where flora and/or fauna habitats exist on-site, the contractor programmes site works to minimise disturbance to wildlife. For example, site preparation, ground works, and soft landscape works have been, or will be, scheduled at an appropriate time of year to minimise disturbance to wildlife. Timing of works may have a significant impact on, for example, breeding birds, flowering plants, seed germination, amphibians etc. Actions such as phased clearance of vegetation may help to mitigate ecological impacts. This additional requirement will be achieved where a clear plan has been produced detailing how activities will be timed to avoid any impact on site biodiversity in line with the recommendations of a Suitably Qualified Ecologist.

POLLUTION

POL 03: Surface Water Run-Off

The main contractor shall implement and install/connect to any attenuation/pollution prevention measures as specified by the site specific drainage design and Flood Risk Assessment to ensure that the risk and impact of localised flooding on and off-site is minimised.

POL 05: Reduction of Noise Pollution

The main contractor shall appoint a 'Suitably Qualified Acoustician' to carry out a noise impact assessment in compliance with BS 7445 to measure/determine the following noise levels:

a. Existing background noise levels at the nearest or most exposed noise sensitive development to the proposed development or at a location where background noise conditions can be argued to be similar;

b. The rating noise level resulting from the new noise source.

The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise sensitive development, is a difference no greater than +5dB during the day (0700 hr to 2300 hr) and +3dB at night (2300 hr to 0700 hr) compared to the background noise level.

Where the noise source from the proposed site/building is greater than the levels described above, the main contractor shall install measures to attenuate the noise at its source to a level where it will comply with the above criteria.

15 Appendix D – BREEAM New Construction 2018 Manual, Issue 2.0

Available on request