Preliminary BREEAM Assessment
British Museum SWEC

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Contents:

Preliminary BREEAM Assessment
British Museum SWEC

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Executive Summary

Introduction
Eight Versa, as registered BREEAM assessors, have carried out an assessment of the proposed new SWEC building at the British Museum, Great Russell St, London WC1B 3DG. This assessment is under BREEAM 2018 New Construction 'Office' methodology.

This summary is a pre-assessment of the development and details the anticipated score following the information provided by the design team at a meeting held 8th November 2022 and subsequent discussions.

Project summary
The planning application consists of the fit-out of The South West Energy Centre (SWEC), which is a six floor office building located within The British Museum, in the London Borough of Camden. The scope of the building is fully fitted.

Planning requirement for the new build development is as follows:

- Excellent BREEAM rating

Score summary
The site reviewed currently targets a score of 75.2%, which equates to an Excellent rating.

The action plan on the following pages details the measures required to increase the score to a potential 84.3%, which equates to an Excellent rating.

Eight Versa recommends a safety margin of at least 3-5% to safeguard any rating at formal assessment.

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British Museum SWEC

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Introduction

The BREEAM standard

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's first sustainability rating scheme for the built environment. It sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance.

To date BREEAM has been used to certify over 560,000 building assessments across the building life cycle and is being applied in over 80 countries.

BREEAM is developed, operated and maintained by BRE Global Ltd and the operation and direction of the method is overseen by an independent Sustainability Board, representing a wide cross-section of construction industry stakeholders. Further information about BREEAM, including copies of the BREEAM standards, can be found at www.breeam.org.

Aims of BREEAM

- To mitigate the impacts of buildings on the environment
- To enable buildings to be recognised according to their environmental benefits.
- To provide a credible, environmental label for buildings.
- To stimulate demand for sustainable buildings.

BREEAM New Construction

BREEAM New Construction is a performance-based assessment method and certification scheme for new buildings.

The primary aim of BREEAM New Construction is to mitigate the life cycle impacts of new buildings on the environment in a robust and cost-effective manner. It attempts to quantify and reduce the environmental burdens of buildings by rewarding those designs that take positive steps to minimise their environmental impacts.

Projects are assessed at design and post-construction stages using a system of environmental issues grouped within the following sections:

- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use & Ecology
- Pollution
- Innovation

Preliminary BREEAM Assessment
British Museum SWEC

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Process of the assessment
Under BREEAM New Construction 2018, assessments take place over two phases:

- Design Stage (DS): This is based on the final design for the development and the intentions of the design team. Submission before the completion of RIBA Stage 4.
- Post Construction Stage (PCS): This is based on the built development and requires the BREEAM assessor to carry out a site visit. Submission at RIBA Stage 6.

An interim certificate will be provided following submission of the Design Stage Assessment, with final certification being awarded following the completion of the PCS Assessment.

Ratings
The assessment process results in a rating on a scale of PASS, GOOD, VERY GOOD, EXCELLENT and OUTSTANDING. The rating bands for each are as follows:

Rating	Minimum score required	Performance equivalent to (% of UK new non-domestic buildings)
Pass (P)	30%	<75% (standard good practice)
Good (G)	45%	<50% (intermediate good practice)
Very Good (VG)	55%	<25% (advanced good practice)
Excellent (E)	70%	<10% (best practice)
Outstanding (O)	85%	<1% (innovator)

Mandatory credits
Some credits, or criteria within credits, are mandatory to achieve certain ratings:

BREEAM Issue	P	G	VG	E	O
Man 03: Responsible construction practices	-	-	-	1 credit	2 credits
Man 04: Commissioning & handover	-	-	1 credit[1]	1 credit	1 credit
Man 04: Commissioning & handover	-	-	Criterion 11[2]	Criterion 11	Criterion 11
Man 05: Aftercare	-	-	-	1 credit[3]	1 credit
Ene 01: Reduction of CO2 emissions	-	-	-	4 credits	6 credits
Ene 02: Energy monitoring	-	-	1 credit	1 credit	1 credit
Wat 01: Water consumption	-	1 credit	1 credit	1 credit	2 credits
Wat 02: Water monitoring	-	Criterion 1[4]	Criterion 1	Criterion 1	Criterion 1
Mat 03: Responsible sourcing	Criterion 1[5]	Criterion 1	Criterion 1	Criterion 1	Criterion 1
Wst 01: Construction waste	-	-	-	-	1 credit
Wst 03: Operational waste	-	-	-	1 credit	1 credit

[1] Commissioning – testing schedule and responsibilities must be produced for the site.
[2] A Building User Guide must be developed prior to handover, for distribution to the building occupiers and premises managers.
[3] Complete required commissioning activities over a minimum 12-month period once the building has become occupied.
[4] A water meter must be specified on the mains water supply to each building
[5] All timber and timer-based products used on the project must be legally harvested and traded. Full details for each credit follow later in this document.

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British Museum SWEC

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Early-stage considerations

There are a number of key actions that need to be undertaken at RIBA Stages 1, 2 and 4 of the design to achieve BREEAM credits, as required for the project. See summary below:

Credit	RIBA Stage	Requirement	Responsibility
Man 01 Project delivery planning	Stage 2	Project stakeholders must meet to define their roles, responsibilities and contributions for each key phase of the project by the end of RIBA Stage 2.	Project Manager, key design team members
Man 01 BREEAM AP (Concept Design)	Stage 1 Stage 2	Appoint a sustainability champion (BREEAM AP) Agree BREEAM performance target.	Client / Project Manager
Man 02 Elemental level Life Cycle Costing (LCC) options appraisal	Stage 2	An Elemental level Life Cycle Costing analysis must be carried out before the end of RIBA Stage 2.	Specialist Consultant
Man 02 Component level Life Cycle Costing (LCC) options appraisal	Stage 4	A Component level Life Cycle Costing analysis must be carried out before the end of RIBA Stage 4.	Specialist Consultant
Ene 04 Passive Design Analysis	Stage 2	A Passive Design Analysis must be carried out at the early design stages to identify opportunities to implement passive design measures within the building design	Energy Specialist / M&E Consultant
Ene 04 Low Zero Carbon Feasibility Study	Stage 2	A feasibility study must be carried out before the end of RIBA Stage 2 to establish the most appropriate local low or zero carbon (LZC) energy source(s) for the building	Energy Specialist
Tra 01 Transport Assessment and Travel Plan	Stage 2	A site-specific transport assessment and draft travel plan to assess existing local transport and identify improvements to make it more sustainable.	Transport Consultant
Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)	Stage 2 Stage 4	Concept design stage: The options appraisal summary document must be carried out before the end of RIBA Stage 2. An update is required at RIBA Stage 4.	Life Cycle Analysis Consultant
Mat 03 Enabling sustainable procurement	Stage 2 & 4	A sustainable procurement plan must be developed to guide specification to sustainable construction products.	Architect / client
Mat 06 Materials Efficiency	Stage 2 & 4	Materials efficiency must be investigated, and considerations recorded at RIBA stage 2, and each stage thereafter.	Specialist Consultant / Architect / M&E
Wst 01 Pre-demolition audit	Stage 2	Audit of the existing building to maximise recovery of materials before the end of Concept Design.	Demolition contractor
Wst 05 Climate Change Adaptation	Stage 2 & 4	A climate change adaptation strategy appraisal must be carried out for structural and fabric resilience before the end of the Concept Design stage. An update is required at stage 4.	Specialist Consultant / M&E Consultant

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Credit	RIBA Stage	Requirement	Responsibility
Wst 06 Design for disassembly and adaptability	Stage 2 & 4	A building-specific functional adaptation strategy study must be undertaken by the Concept Design, which includes recommendations to facilitate future adaptation. An update is required at stage 4.	Client / Design Team
LE02 Identifying & understanding the risks and opportunities for the project	Stage 1 - 2	A Suitably Qualified Ecologist (SQE) is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions	Client / Project Manager / Ecologist
LE03 Managing negative impacts on ecology	Stage 2 - 4	Roles and responsibilities for managing negative impacts on ecology are clearly defined at an early enough stage to influence the Preparation and Brief or Concept Design	Client / Project Manager / Ecologist

Extra appointment considerations

It should also be considered that there are a number of external consultant reports that will be required to meet some of the BREEAM requirements for the credits that have been targeted.

These include the following appointments / reports:

- Energy Consultant: Reduction of energy Use and Carbon Emissions (Ene 01), Low Carbon Design (Ene 04) and Thermal Comfort (Hea 04)
- Transport Consultant: (Tra 01): Travel Plan
- Ecologist: Minimising impact on existing site ecology, enhancing site ecology and long term impact on biodiversity (LE 03, LE 04 and LE 05)
- Flood Risk Consultant: Surface Water run off (Pol 03)

Preliminary BREEAM Assessment
British Museum SWEC

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Score Breakdown

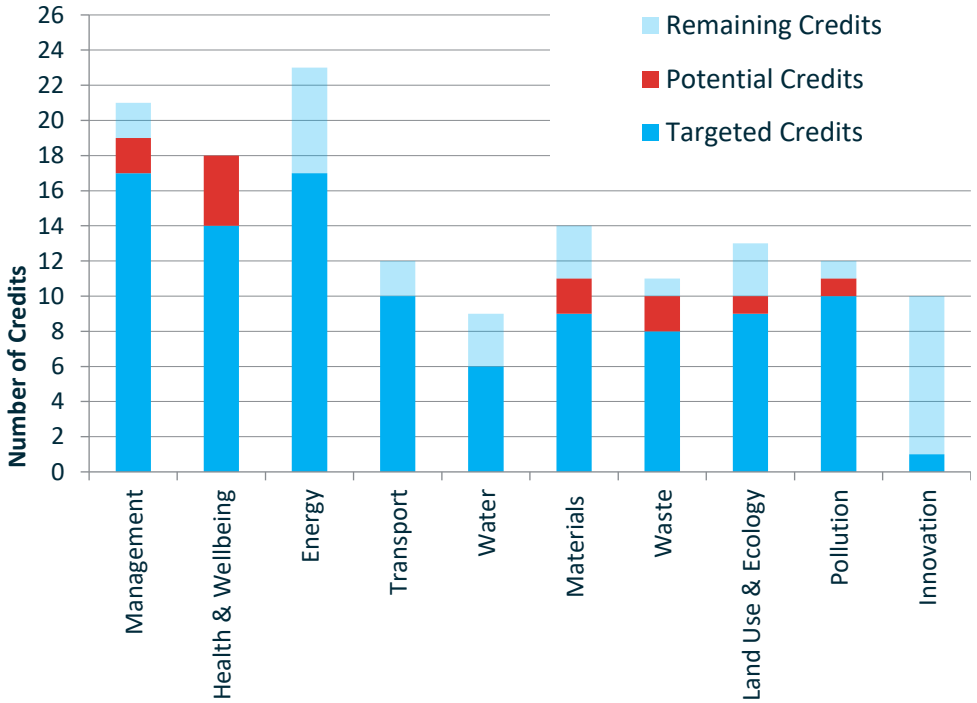
Rating summary

The following summary represents the scheme's preliminary score based on the assumptions in the following pages.

Credit Categories	% Targeted	Weighting	Score
Management	81%	11%	8.90%
Health and Wellbeing	78%	14%	10.88%
Energy	74%	16%	11.82%
Transport	83%	10%	8.33%
Water	67%	7%	4.66%
Materials	64%	15%	9.64%
Waste	73%	6%	4.36%
Land Use and Ecology	69%	13%	9.00%
Pollution	83%	8%	6.66%
Innovation	10%	10%	1.00%
Total Score			**75.20%**
Rating			**Excellent**

Graphics breakdown

The graph below shows the credits currently targeted (dark blue), action credits (red) and remaining credits in each BREEAM section (light blue).



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British Museum SWEC

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Management

Man 01: Project brief and design 3 of 4

Project delivery planning (one credit)
The design team has met to identify roles and responsibilities, as well as contributions for each key phase of the project.

Stakeholder consultation (one credit)
The design team may undertake consultation with the appropriate stakeholders in accordance with BREEAM requirements.

BREEAM AP (two credits)
The design team has confirmed that a BREEAM Accredited Professional (AP) will be involved to monitor and report progress against the established BREEAM targets by attending key project team meetings during all stages of the design and construction. The BREEAM AP attended the initial design team meeting and will continue to attend key meetings, identifying risks and opportunities to achieving each target and provide feedback to the project team.

In total, three out of four credits are currently targeted for this issue.

Man 02: Life cycle cost and service life planning 2 of 4

Elemental life cycle costing (two credits)
An elemental life cycle cost analysis will not be carried out at RIBA stage 2 in accordance with PD 156865-2008.

Component level life cycle options appraisal (one credit)
A component level LCC options appraisal will be carried out by RIBA stage 4 to minimise life cycle costs and maximise value.

Capital cost reporting (one credit)
The design team has committed to report the capital cost for the building in pounds per square metre (£k/m2), via the BREEAM Assessment Scoring and Reporting tool in line with BREEAM requirements.

In total, two out of four credits are currently targeted for this issue.

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Man 03: Responsible construction practices **6 of 6**

Mandatory requirements
At least one credit must be awarded under responsible construction management to achieve an Excellent rating.

Timber (prerequisite)
The contractor will be required to ensure all site timber, such as hoarding, will be legally harvested and traded.

Environmental management (one credit)
The design team will appoint a principal contractor who operates an Environmental Management System for their main operations, certified under ISO14001/ EMAS or an equivalent standard.

BREEAM Accredited Professional (AP) (prerequisite)
The client and the contractor will formally agree performance targets. A BREEAM AP has been involved in the project at an appropriate time and level.

BREEAM AP (site) (one credit)
The BREEAM AP will ensure ongoing compliance with the relevant sustainability performance on site once the contractor is appointed. The BREEAM AP will be involved with the project team undertaking regular spot checks to ensure risks are minimised and monitoring construction progress.

Responsible construction management (two credits + 1 exemplary level credit)
The contractor will be required to complete all the BREEAM required items in the table in Appendix A of this report in order to achieve two credits plus the exemplary level credit.

Monitoring of construction-site impacts (two credits)
The design team has confirmed that the contractor will be required to ensure an individual is responsible for monitoring, recording and reporting the following:

- Energy (kWh) consumption for the site as a result of construction plant, equipment and site accommodation. Total carbon dioxide emissions must be reported.
- Water (m^3) consumption arising from the use of construction plant, equipment and site accommodation.
- Transport resulting from delivery of construction materials to site and removal of construction waste from site:
    - Transportation of materials from the point of supply to the building site:
        i. Materials used in major building elements; and,
        ii. Ground works and landscaping materials.
    - Transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate.
    - The following information will be recorded:
        i. Litres of fuel used;
        ii. Distance travelled (km); and,
        iii. Carbon dioxide emissions ($kgCO_2$ eq).

In total, six of six credits are currently targeted for this issue plus the exemplary level credit.

Preliminary BREEAM Assessment
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Man 04: Commissioning and handover 3 of 4

Mandatory requirements
A Building User Guide must be produced in order to achieve an Excellent rating (even if this credit is not targeted).

Commissioning (two credits)
A member of the design team will be appointed to monitor commissioning in line with best practice (CIBSE, BSRIA and Current Building Regulations), with a specialist commissioning agent appointed for any complex systems.

Testing and inspecting building fabric (one credit)
The design team has confirmed that, although an air tightness test will be carried out as standard, a thermography survey may not be undertaken.

Handover (one credit)
The production of a technical manual and a non-technical building user guide in line with the BREEAM requirements is planned. In addition, a training schedule will be prepared for building occupiers / facilities managers to aid handover and correct use of the building and its services upon occupation.

In total, three of four credits are currently targeted for this issue.

Man 05: Aftercare 3 of 3

Mandatory requirements
Seasonal commissioning must be carried out in order to achieve an Excellent rating.

Aftercare support (one credit)
There will be operational infrastructure and resources in place to provide aftercare support to the building occupier and to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is occupied.

Commissioning implementation (one credit)
Seasonal commissioning activities will be completed over a minimum 12-month period, once the building becomes substantially occupied.

Post occupancy evaluation (one credit)
The client will carry out a post occupancy evaluation (POE) exercise one year after initial building occupation.

In total, three of three credits are currently targeted for this issue.

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Health and Wellbeing

Hea 01: Visual comfort — 3 of 5

Control of glare from sunlight (one credit)
The design team has confirmed that blinds will be utilised on windows to areas at risk of glare.

Daylighting (two credits)
Daylight modelling is being considered and may be included within the design scope.

View out (one credit)
The design team has confirmed that all workstations are to be 8m from a wall that has a window or permanent opening providing an adequate view out for over 95% of the floor area. Windows or openings will comprise at least 20% of the surrounding wall area.

Internal and external lighting levels, zoning and controls (one credit)
The design team has confirmed the following will be met for the scheme:

- All fluorescent and compact fluorescent lamps will be fitted with high frequency ballasts;
- Internal lighting will provide illuminance levels in accordance with the SLL Code of Lighting 2012 (and any other relevant industry standard);
- For areas where computer screens are regularly used the lighting design will comply with the appropriate sections of CIBSE Lighting Guide 7;
- All external lighting will provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately;
- Internal lighting will be appropriately zoned to allow for occupant control within relevant building areas in accordance with the BREEAM criteria;
- External lighting will be specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting – Lighting of workplaces – Part 2: Outdoor workplaces);

In total, three of five credits are currently targeted for this issue.

Hea 02: Indoor air quality — 3 of 4

Indoor air quality plan (prerequisite)
A formalised Indoor Air Quality plan will be produced for the development and implemented to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building.

Ventilation (one credit)
The design team have confirmed that the building will be designed to minimise indoor concentration and recirculation of pollutants by providing fresh air into the building in accordance with the relevant standard for ventilation.

Emissions from construction products (two credits)
The design team has confirmed that at least three of the product types listed in the BREEAM 2018 manual table 5.11 will meet the emission limits, testing requirements and any additional requirements in line with requirements. One out of two credits are targeted.

Post-construction indoor air quality measurement (one credit)
The design team will undertake air quality testing to measure VOC and formaldehyde concentration levels at post-construction stage.

In total, three of four credits are currently targeted for this issue.

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Hea 04: Thermal comfort 3 of 3

Thermal modelling (one credit)
Thermal modelling, in line with CIBSE AM11, will be undertaken for the development using full dynamic thermal analysis software. Summer and winter operative temperature ranges in occupied spaces will be in accordance with the criteria set out in CIBSE Guide A Environmental design.

Design for future thermal comfort (one credit)
The design team has confirmed that the thermal modelling will include an allowance for a projected climate change environment.

Thermal zoning and controls (one credit)
The thermal modelling analysis will inform the thermal comfort strategy. The heating and cooling are to be zoned and controlled appropriately for the building type and its users' requirements.

In total, three of three credits are currently targeted for this issue.

Hea 05: Acoustic performance 3 of 3

The design team has confirmed that acoustic testing will take place to confirm compliance with the acoustic principles of:

- Sound insulation
- Indoor ambient noise level
- Room acoustics

The above will be confirmed via a programme of pre-completion testing, carried out by a compliant test body.

In total, three of three credits are currently targeted for this issue.

Hea 06: Security 0 of 1

Security of site and building (one credit)
It is not expected that a suitably qualified security consultant will be consulted during the planning process to produce a Security Needs Assessment.

This credit is not currently targeted.

Hea 07: Safe and healthy surroundings 2 of 2

Safe access (one credit)
The design team have confirmed that there will be separate access routes for pedestrians, cyclists and vehicles.

Outside space (one credit)
The design team has confirmed the provision of an outside amenity area for building users will be provided.

In total, two out of two credits are currently targeted for this issue.

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Energy

Ene 01: Reduction of CO_2 emissions — 8 of 13

Mandatory requirements
At least four credits must be achieved in order to secure an Excellent rating.

Energy performance (nine credits)
An energy assessment will be undertaken at design stage, based on Part L 2013 standards. Based on the building services and fabric specified, it is assumed that four of the available nine credits under this issue will be achieved.

Please note that the BREEAM guidance requests a copy of the Building Regulations Output (BRUKL Output Document) based on the design stage and an as-built copy of the document for the post construction stage.

Prediction of operational energy consumption (Pre-requisite)
To achieve the following operational energy credits, the passive design analysis must be carried out in concept design stage.

Prediction of operational energy consumption (four credits)
It is confirmed that relevant members of the design team will hold a design workshop focusing on operational energy performance.

Eight of thirteen credits are targeted for this issue.

Ene 02: Energy monitoring — 2 of 2

Mandatory requirements
The minimum requirement for sub-metering of end-use categories must be met in order to achieve an Excellent rating.

Sub-metering of end-use categories (one credit)
Pulsed sub-meters will be provided to ensure the following are met:

1. Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems.
2. The systems in smaller buildings are metered either with an energy monitoring and management system or with separate accessible energy sub-meters with pulsed or other open protocol communication outputs, to enable future connection to an energy monitoring and management system.
3. The end energy consuming uses are identifiable to the building users, for example through labelling or data outputs.

Sub-metering of high energy load & tenancy areas (one credit)
The design team has confirmed that there will be sub-metering per floor plate.

Two of two credit is currently targeted for this issue.

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Ene 03: External lighting 1 of 1

The design team has confirmed that any external lighting will have an average initial luminous efficacy of greater than 70 luminaire lumens per circuit Watt. All external light fittings will be automatically controlled to prevent operation during daylight hours.

One of one credit is currently targeted for this issue.

Ene 04: Low carbon design 2 of 3

Passive design analysis (one credit)
A passive design analysis will be undertaken to confirm energy and CO_2 savings achieved as a result of passive design measures.

Free cooling (one credit)
The design team has confirmed that the credit for free cooling will not be targeted.

Low and zero carbon technologies (one credit)
A feasibility study will be carried out by an independent energy specialist to establish the most appropriate local low or zero carbon energy source for the development, and an LZC technology will be specified in line with the recommendations of this report (resulting in a reduction in CO_2 emissions).

Two of three credits are currently targeted for this issue.

Ene 06: Energy Efficient Transportation Features 2 of 2

Energy consumption (one credit)
The design team has confirmed that a transportation demand and usage pattern analysis for the building to determine the optimum number and size of lifts, escalators or moving walks is accordance with BS EN ISO 25745. The energy consumption will be calculated for at least two types of system and the one with the lowest energy consumption is specified.

Energy efficient features (one credit)
The design team has confirmed they will be specifying the following energy efficient features for each lift:

- A standby condition for off-peak periods.
- The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of >70 luminaire lumens per circuit Watt.
- Use of a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVF) control of the drive motor.

Regenerative drives are considered where these would produce an energy saving greater than the additional standby energy used to support the drives.

Two of two credits are targeted.

Ene 08: Energy Efficient Equipment 2 of 2

Energy efficient equipment (two credits)
The design team has confirmed they will identify the building's unregulated energy consuming loads and estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical or standard specification.
They will identify the systems or processes that use a significant proportion of the total annual unregulated energy consumption of the building to demonstrate a meaningful reduction in the total annual unregulated energy consumption of the building.

The design team has confirmed that the client will purchase the relevant low energy consuming equipment.

Two of two credits are targeted.

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Transport

Tra 01: Transport assessment and travel plan — 2 of 2

Travel plan (two credits)
The design team has confirmed that during the feasibility and design stages a travel plan will be developed based on a site-specific travel assessment or statement.

The travel plan will include proposals to increase/improve sustainable modes of transport and movement of people and goods.

Two of two credits are targeted for this issue.

Tra 02: Sustainable transport measures — 8 of 10

Transport options implementation (ten credits)
The design team has confirmed that the potential sustainable transport measures can be targeted, with the following considered for inclusion:

- An accessibility index greater than 8
- Provision of cycle spaces for building users
- Provision of cyclist facilities (at least two of the following: shower spaces, locker spaces, drying spaces and changing spaces)
- Proximity to three existing amenities

Eight out of ten credits are targeted for this issue.

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Water

Wat 01: Water consumption 2 of 5

Mandatory requirements
At least one credit is required for an Excellent rating.

Water consumption (five credits)
The design team has confirmed that they will aim for a 25% improvement in water consumption (litres/person/day) compared to BREEAM's notional baseline performance.

To achieve this, it is anticipated that specified sanitaryware will meet the following thresholds:

- WCs will have 4 litres effective flush volume.
- Wash hand basins will have a flow rate of no greater than 6 litres/min
- Showers will have a flow rate of no greater than 8 litres/min.
- Kitchen taps will have a flow rate of no greater than 7 litres/min
- Domestic dishwashers will have a capacity of no greater than 13 litres/cycle.
- Commercial dishwashers will have a capacity of no greater than 6 litres/rack.
- Domestic washing machine will have a capacity of no greater than 50 litres/use.
- Commercial washing machine will have a capacity of no greater than 10 litres/kg.

Alternatively higher flush volumes and flow rates can be provided if there is a rainwater harvesting system installed in compliance with BS EN 16941-1:2018.

Two of five credits are currently targeted for this issue.

Wat 02: Water monitoring 1 of 1

Mandatory requirements
A water meter must be specified (even if this credit is not targeted) in order to achieve an Excellent rating.

Water monitoring (one credit)
The design team has confirmed that a pulsed water meter will be installed on the mains water supply to each building.

There will be no water-consuming plant or building areas consuming 10% or more of the building's total water demand.

The available credit is currently targeted for this issue.

Wat 03: Water leak detection and prevention 2 of 2

Leak detection (one credit)
The design team has confirmed a major leak detection system on the mains water supply within the building and between the building and the utilities water meter will be provided. The system will comply with the following:

- Permanent and automated.
- Activated when the flow of water is at a flow rate above a pre-set maximum for a pre-set period of time.
- Able to identify different flow and leakage rates.
- Programmable to suit the owner/occupiers' water consumption criteria.
- Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.

Sanitary shut-off system (one credit)
Flow control devices that regulate the supply of water to each WC area according to demand will be installed. This will assist with minimising water leaks and wastage from worn sanitary fittings.

Two of two credits are currently targeted for this issue.

Wat 04: Water efficient equipment 1 of 1

This design team has confirmed that processes will be identified to reduce the unregulated water demand from uses other than sanitary ware, for example by introduction of drip fed irrigation or inclusion of a solenoid valve.

One of one credit targeted.

Preliminary BREEAM Assessment
British Museum SWEC

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Materials

Mat 01: Environmental impacts from construction products building life cycle assessment (LCA) 5 of 7

Superstructure (six credits)
The design team has confirmed that a Life Cycle Assessment (LCA) will be carried out at key stages to demonstrate that the specification of material build-ups and their impact has been considered. The Stage 2 LCA will be uploaded to the BRE prior to planning submission.

Four out of six credits are targeted.

Substructure and hard landscaping options appraisal during concept design (all building types) (one credit)
The design team has confirmed that during Concept Design, opportunities have been identified to reduce environmental impacts.

One credit is targeted.

Core building services options appraisal (exemplary level credit)
The LCA will not include an analysis of core building services to achieve one exemplary level credit.

In total, five of seven credits are targeted for this issue.

Mat 02: Environmental impacts for construction products Environmental Product Declarations (EPD) 0 of 1

The contractor may be asked to source materials covered by an Environmental Product Declaration (EPD) where possible, however it is not yet confirmed if this credit will be achievable.

The available credit is not currently targeted for this issue.

Preliminary BREEAM Assessment
British Museum SWEC

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Mat 03: Responsible sourcing of materials 2 of 4

Mandatory requirements
The pre-requisite for this issue must be complied with (even if this issue is not targeted) in order to achieve any rating.

Pre-requisite
The design team has confirmed that all timber used on the project will be legally harvested and traded timber.

Enabling sustainable procurement (one credit)
The design team will implement a sustainable procurement plan for this development prior to Concept Design to guide specification towards sustainable construction products.

Measuring responsible sourcing (three credits)
The design team has confirmed that, where possible, key building elements will be responsibly sourced (e.g. all timber FSC certified, and any bricks, pavers, concrete, glass, metals, plaster etc. covered by BRE Global, BES 60001 certification, or EMS certified for both the key process and supply chain extraction process). One credit is targeted.

Two of four credits are targeted for this issue.

Mat 05: Designing for durability and resilience 1 of 1

Protecting vulnerable parts of the building from damage
Materials and features will be specified to protect vulnerable parts of both the internal and external areas of the building.

Protecting exposed parts of the building from material degradation
The relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors. The elements will either achieve an appropriate quality or durability standard or a resilience assessment will be carried out on the element.

The available credit is targeted for this issue.

Mat 06: Material efficiency 1 of 1

The design team has confirmed that opportunities will be identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance, and end of life.

The available credit is targeted for this issue.

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Waste

Wst 01: Construction site waste management 3 of 5

Pre-demolition audit (one credit)
It is not confirmed if a pre-demolition audit will be completed for any existing buildings or hard surfaces being considered for demolition. This could be used to determine whether refurbishment or reuse of materials is feasible.

Construction resource efficiency (three credits)
The design team has confirmed that a BREEAM compliant Site Waste Management Plan will be produced by the contractor and will ensure that non-hazardous waste generated throughout the building's design and construction (excluding demolition and excavation waste) will be less than 7.5m^3 (or 6.5 tonnes) per 100m2 of gross internal floor area. Two credits are targeted.

Diversion of resources from landfill (one credit)
The contractor will be required to ensure that at least 70% by volume (80% by weight) of non-hazardous waste generated by the project will be diverted from landfill, and 80% by volume (90% by weight) of demolition waste will be diverted from landfill.

Three of five credits are targeted for this issue.

Wst 02: Use of recycled and sustainably sourced aggregates 0 of 1

Project sustainable aggregate points (one credit)
The use and type of aggregates within the development will be identified, the total amount of recycled and/or secondary aggregate, the region the aggregate was sourced, and the distance travelled. However it is not anticipated that the targets will be met to achieve this credit.

The available credit is not currently targeted.

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Wst 03: Operational waste 1 of 1

Mandatory requirements
One credit is required in order to achieve an Excellent rating.

Operational waste (one credit)
The design team has confirmed that a dedicated recyclable waste storage area will be provided of a capacity appropriate to the building type and size. The space will be clearly labelled and accessible.

Where consistent and large amounts of operational waste are generated, static waste compactors or balers will be provided in a service area or dedicated waste management space.

Where consistent and large amounts of compostable waste are generated, vessels will be provided for composting organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility. A water outlet must be provided adjacent or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.

The available credit is targeted for this issue.

Wst 04: Speculative finishes (offices only) 1 of 1

The design team has confirmed that all floor and ceiling finishes will be installed as per the tenants confirmation.

The available credit is targeted for this issue.

Wst 05: Adaptation to climate change 1 of 1

Resilience of structure, fabric, building services and renewables installation (one credit)
The design team has confirmed that a climate change adaptation strategy will be undertaken for the development.

The available credit for this issue is currently targeted.

Wst 06: Designing for disassembly and adaptability 2 of 2

Design for disassembly and functional adaptability recommendations (one credit)
The design team will conduct a study to explore the ease of disassembly and functional adaptation potential of different scenarios before the end of Concept Design.

Disassembly and functional adaptability implementation (one credit)
The design team will provide an update during Technical Design of how the recommendations of the study have been implemented or developed.

Two of two credits are targeted for this issue.

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Land Use and Ecology

LE 01: Site selection 1 of 2

Previously developed land (one credit)
The development is situated on at least 75% previously developed land.

Contaminated land (one credit)
There may not be a contamination study that verifies if the development land is affected by contamination. Therefore, the design team may not be able to propose any remediation strategy to be implemented.

One of two credits are targeted for this issue.

LE 02: Identifying and understanding the risks and opportunities for the project 2 of 2

Prerequisite - Assessment route role
The contractor will be required to confirm that compliance is monitored against all relevant UK and EU legislation relating to the ecology of the site.

Route 2 - Survey and evaluation (two credits)
The design team has confirmed that the ecologist was appointed at an early project stage to ensure early involvement in the project. An appropriate level of survey and evaluation has been carried out (during the preparation and brief) to determine the ecological baseline of the site.

Two of two credits are targeted for this issue.

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LE 03: Managing negative impacts on ecology 2 of 3

Pre-requisite – Ecological risks and opportunities
LE 02 is achieved to meet the pre-requisite requirements.

Planning and measures on-site (one credit)
The design team has confirmed that individuals are aware of their roles and responsibilities with regards to ecology and biodiversity. The potential impact of site preparation and construction works will be identified by the ecologist to optimise benefits and outputs for biodiversity.

The project team (whilst liaising and collaborating with representative stakeholders and, taking into consideration data collated and shared), has confirmed they will propose solutions and selected measures to be implemented during site preparation and construction works.

One of one credit targeted.

Route 2 - Managing negative impacts of the project (two credits)
The design team expects to minimise the loss of ecological value from site preparation. Also, construction works will be managed according to the hierarchy in line with recommendations from the ecologist. One credit is targeted.

In total, two of three credits are targeted for this issue.

LE 04: Change and enhancement of ecological value. 2 of 4

Prerequisite – Managing negative impacts on ecology
Roles and responsibilities have been clearly defined by the design team, site preparation and construction works have been planned, and all UK and EU legislation will be complied with.

Route 2 – Ecological enhancement (one credit)
The design team has confirmed they have liaised and collaborated with representative stakeholders, taking into consideration data collated and shared, and they will implement solutions and measures selected in a way that enhances ecological value on and off site.

Route 2 - Change and enhancement of ecology (up to 3 credits)
The project team has confirmed they will liaise and collaborate with representative stakeholders, taking into consideration data collated and shared. There is expected to be a positive change in ecological value occurring as a result of the project, but this has yet to be confirmed by the suitably qualified ecologist for the scheme. One credit is currently targeted.

In total, two of four credits are targeted for this issue.

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LE 05: Long term ecology management and maintenance **2 of 2**

Prerequisite – Statutory obligations, planning and site implementation
The design team has confirmed that all UK and EU legislation will be complied with.

Management and maintenance throughout the project (one credit)
The project team has confirmed that they will liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented. Monitoring and reporting of outcomes and successes will be completed. A section on ecology and biodiversity will be included as part of the building owner information.

Landscape and ecology management plan (or similar) development (one credit)
The project team has confirmed that a landscape and ecology management plan will be developed in accordance with BS 42020:2013, covering, as a minimum, the first five years after the project completes.

In total, two of two credits are targeted for this issue.

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Pollution

Pol 01: Impact of refrigerants 2 of 3

Pre-requisite
All systems with electronic compressors will comply with the requirements of BS EN 378:2016 (parts 2 and 3) and, where systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.

Impact of refrigerants (two credits)
The design team confirmed that the refrigerants of the scheme are expected to have Direct Effect Life Cycle CO_2 equivalent emissions (DELC CO_2e) of ≤ 1000 $kgCO_2e/kW$ cooling/heating capacity.
One of two credits targeted.

Leak detection (one credit)
The design team has confirmed that a refrigerant leak detection system will be installed.

Two of three credits are targeted for this issue.

Pol 02: Local air quality 2 of 2

The design team has confirmed that the heating, cooling and hot water will be supplied using electricity, therefore both credits are awarded by default.

Two of two credits are targeted for this issue.

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Pol 03: Surface water run-off 4 of 5

Flood risk (two credits)
A site-specific Flood Risk Assessment will be undertaken for the site, confirming the flood risk zone. Initial investigations indicate the site is in flood zone 1.
Two of two credits targeted.

Surface water run-off (two credits)
The design team has confirmed that measures will be specified to ensure that the peak run off rate for the developed site will have a 30% reduction compared to the pre-developed site. The design team confirmed that the post development run-off volume, over the development lifetime, will not be greater than it would have been prior to the site's development and flooding of property will not occur in the event of local drainage system failure.
Two of two credits targeted.

Minimising watercourse pollution (one credit)
This credit is currently not targeted but the design team will investigate the potential for no discharge from the site for rainfall depths of up to 5 mm.

In total, four of five credits are targeted for this issue.

Pol 04: Reduction of night-time light pollution 1 of 1

The design team has confirmed that external lighting will be designed and installed in compliance with ILP Guidance. All external lighting will have the capacity to be switched off automatically between 11pm and 7am.

One of one credit is targeted for this issue.

Pol 05: Noise attenuation 1 of 1

A Suitably Qualified acoustic consultant will conduct a noise impact assessment in compliance with BS 4142:2014. The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise- sensitive development, must be at least 5dB lower than the background noise throughout the day and night. Where necessary, attenuation measures will be specified.

One of one credit is targeted for this issue.

Preliminary BREEAM Assessment
British Museum SWEC

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Action Plan

Action plan

The following Action Plan outlines the credits that could be targeted to achieve an EXCELLENT rating. Please note that Eight Versa recommends a safety margin of 3-5% above the minimum score in order to ensure that the rating is secured at assessment stage.

Current Score	EXCELLENT (minimum 70%)	75.2%
Man 01 – Stakeholder consultation	One credit could be achieved if all interested parties are consulted with. Design team must demonstrate Stakeholder's contributions to the Initial Project Brief and Concept Design. Feedback must be given to consultees.	0.52%
Man 04 – Testing and inspecting building fabric	One credit could be achieved by carrying out an air tightness test and thermography survey. Any defects identified must be remedied.	0.52%
Hea 01 – Daylighting	Two credits could be achieved dependent on the Average Daylight Factor and Uniformity Ratio to be confirmed by daylighting calculations and report.	1.56%
Hea 02 – Emissions from construction products	An additional credit could be achieved if all product types meet the BREEAM requirements for formaldehyde, TVOC and carcinogens.	0.78%
Hea 06 – Security of site and building	One credit is available if a suitably qualified Security Consultant is appointed to provide recommendations which are incorporated into the design.	0.78%
Mat 01 – Building life cycle assessment (LCA)	An additional credit could be achieved dependent on the results of the analysis of the Life Cycle Assessment (LCA).	1.07%
Mat 02 – Environmental Product Declarations (EPDs)	One credit is available if construction products specified achieve an Environmental Product Declaration (EPD) score of at least 20 in accordance with the BREEAM criteria.	1.07%
Wst 01 – Construction waste management	One credit could be achieved if, prior to any demolition works, a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition.	0.55%
Wst 02 – Recycled & sustainability sourced aggregates	One credit could be achieved if all aggregate uses and types are identified, and the distance travelled by aggregates is confirmed.	0.55%
LE 01 – Site selection	One credit could be achieved by carrying out a contamination study that verifies if the development land is affected by contamination. A remediation strategy must be implemented if needed.	1.00%
Pol 03– Flood and surface water management	One credit could be achieved if there is no discharge from the site for rainfall depths of up to 5 m, appropriate SuDS techniques are used and oil interceptors are installed	0.67%
Score with actions	EXCELLENT (minimum 70%)	84.30%

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Appendix A – Man 03

Ref	Criteria	Required for two credits plus the exemplary credit
Risk evaluation and implementation		
The principal contractor evaluates the risks (on site sand off site), plans and implements actions to minimise the identified risks, covering the following, where appropriate:		
Vehicle movement		
a	Manage the construction site entrance to minimise the impacts (e.g. safety, disruption) arising from vehicles approaching and leaving the development footprint.	X
b	Ensure the development footprint is accessible for delivery vehicles fitted with safety features (e.g. side under run protection) to remove or limit the need for on street loading or unloading. Where on-street loading is unavoidable, this should be appropriately managed.	X
c	Identify access routes to the development footprint, including for heavy vehicles to minimise traffic disruption and safety risks to others.	X
Pollution management		
d	Minimise the risks of air, land and water pollution.	X
e	Minimise the risks of nuisance from vibration, light and noise pollution.	X
Tidiness		
f	Practices ensure the development footprint is safe, clean and organised at all times. This includes, but is not limited to, facilities, materials and waste storage.	X
g	Ensure clear and safe access in and around the buildings at the point of handover.	X
Health and wellbeing		
h	Provide processes and equipment required to respond to medical emergencies.	X
i	The principal contractor identifies and implements initiatives to promote and maintain the health and wellbeing of all site operatives within the development footprint. This can be via site facilities, site management arrangements, staff policies etc.	X
j	Establish management practices and facilities encouraging equality, fair treatment and respect of all site operatives.	X
k	Provide secure, clean and organised facilities (e.g. changing and storage facilities) for site operatives within the development footprint.	X
Security processes		
l	Minimise risks of the site becoming a focus for antisocial behaviour in the local community (e.g. robust perimeter fencing, CCTV, avoid creating dark corners etc.).	X
Training, awareness and feedback		
The principal contractor is responsible for ensuring:		
m	Aspects of the construction process that might impact the community are communicated regularly, ensuring that nuisance and intrusion are minimised.	X
n	Ensure ongoing training is provided, and up to date, for personnel and visitors (covering items a to l above, as appropriate.)	X
o	The principal contractor ensures that site operatives are trained for the tasks they are undertaking (including any site specific considerations).	X
p	The fleet operators undertake driver training and awareness to promote safety within the development footprint and off site.	X
Monitoring and reporting		
The principal contractor ensures:		
q	The fleet operator captures and investigates any road accidents, incidents and near misses and reports them back to the principal contractor. The principal contractor analyses these items.	X
r	All visitor, workforce and community accidents, incidents and near misses are recorded and action is taken to reduce the likelihood of them reoccurring.	X
s	Processes are in place to facilitate collecting and recording feedback from the community and to address any concerns related to the development footprint.	X