TECHNICAL NOTE

Project:	Heathrow Flightpath	**SCS Ref:**	31770
Subject:	BREEAM 2018 Excellent	**Date:**	08th July 2022
To:	Project Team	**From:**	Melinda Bende

INTRODUCTION

The purpose of this technical note is to confirm the BREEAM 2018 design actions that are required to take place during RIBA Stages 1 [Feasibility & Brief] and Stage 2 [Concept Design].

Reference should be made to the BREEAM 2018 New Construction technical manual [SD5078] for a comprehensive description of all credit requirements. The following BREEAM 2018 credits are subsequently discussed:

Credit	Party	Timescale	Complete?
1. LE 02 to 03 - Ecology credits, early advice	**Middlemarch**	**RIBA Stage 1 or early in the project's development**	Y
2. MAT 03 - Sustainable Procurement Plan	**G&T**		Y
3. MAT 06 - Materials Efficiency	**G&T**		Y
4. MAT 01 - Lifecycle Assessment (LCA)	**SCS**	**Prior to planning submission and RIBA Stage 2**	Y
5. MAN 01 - BREEAM AP	**G&T / SCS**	RIBA Stage 2	Y
6. MAN 01 – Stakeholder third party consultation	**Iceni**		Y
7. ENE 04 - Passive Design & LZC Report	**Iceni**		Y
8. TRA 01 - Travel Plan	**Mayer Brown**		Y
9. WST 05 - Adaptation to Climate Change	**Chetwoods / Iceni / Hydrock**		Y
10. WST 06 - Disassembly and Adaptation	**Chetwoods / Iceni / Hydrock**		Y
11. MAT 06 - Materials Efficiency	**Chetwoods / Iceni / Hydrock**		Y

1.0 LE 02 TO LE03: ECOLOGY CREDITS

RIBA Stage 1 & 2:

Middlemarch (ecologist) provided early stage advice on:

- How best to negotiate the new BREEAM 2018 ecology requirements.
- Relevant recommendations for ecology protection, mitigation and enhancement at concept stage.
- Conduct a site survey if required at this stage.
- An early indicator of the number of credits which may be achievable for the project, given the pre and post-development land types.
- Complete the BREEAM checklist (2018 version) as far as possible at Concept design stage. This will be fully completed later at Stages 3 or 4.

Before the end of RIBA Stage 2, the **suitably qualified ecologist** completed **sections LE 02 and LE03 of the BREEAM Guidance Note GN40** Ecology Assessment Issues Reporting Template (i.e.pages 3 & 17-24). Where necessary support should be provided, the site should be surveyed, and discussions held with the project team to allow this document to be completed.

It should be understood that a further appointment would be required to formally complete the BREEAM ecology report following completion of the landscape design during stages 3 or 4. (i.e. to assist with completing sections LE 04 and LE 05 of GN40).

2.0 MAT 03: SUSTAINABLE PROCUREMENT PLAN

RIBA Stage 1:

Gardiner & Theobald have provided a **project specific plan**, which identifies opportunities and targets for sustainable procurement of construction products.

The plan is:

- In place before Concept Design.
- Includes sustainability aims, objectives and strategic targets to guide procurement activities.
- Includes a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible.
- Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan.

3.0 MAT 06: MATERIALS EFFICIENCY

RIBA Stage 1:

Gardiner & Theobald have provided a **briefing document** for waste reduction for the Heathrow flightpath project.

This document includes:

- headline measures for the designers to consider. E.g. reuse of existing facilities or equipment. Use of innovative materials or construction systems.
- Requirement for a site waste management plan to be used prior to and during construction.
- A target construction waste generation of 6.5 tonnes per 100sqm project floor area, (excluding demolition and excavation waste).
- Target of Construction waste diverted from landfill to exceed 90% by tonnage for non demolition waste.
- Supports & seeks opportunities for off-site prefabrication of building elements.
- Whether the site is envisaged to provide enough space and access to be able to crane large elements of the building into place.
- Investigate material suppliers which claim to provide low waste materials

4.0 MAT 01 - LIFECYCLE ASSESSMENT (LCA)

Life Cycle Assessment was undertaken prior to planning submission or RIBA Stage 2.

OneClick LCA software used to conduct a concept stage materials appraisal identify opportunities for reducing environmental impacts as follows:

- Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options.
- Use a building LCA tool that is recognised by BREEAM (LCA OneClick).
- For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency).
- Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document.
- Record the following in the Mat 01/02 Results Submission Tool: The differences between the design options; the design option selected by the client to be progressed beyond Concept Design; the reasons for selecting it and the reasons for not selecting the other design options.

5.0 MAN 01: BREEAM AP

RIBA Stage 1:

By the end of RIBA Stage 2, **G&T / Chetwoods** confirmed that as part of the brief, a target of BREEAM Excellent is to be achieved.

Records were kept to show that the assessors worked with the client and project team to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM.

BREEAM trackers were issued, which flag up targets, risks, and opportunities.

Continued support was provided to the design team to produce the relevant documents.

6.0 MAN 01 – STAKEHOLDER THIRD PARTY CONSULTATION

RIBA Stage 2

Iceni carried out a third-party consultation exercise to provide **a statement of community involvement** confirming all interested parties have been consulted on the relevant topics.

This includes but is not limited to:

- Intended building users including facilities management staff or those responsible for the day-to-day operation of the building and grounds.
- Existing partnerships and networks that have knowledge of, and experience of working on, existing buildings of the same type.
- Potential users of any shared facilities, e.g. operators of clubs and community groups.
- In educational building types, representatives of local education authorities, board of governors etc.
- Local or national historic or heritage groups (over and above any requirements relating to statutory consultees).
- Specialist service and maintenance contractors or representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories

The minimum consultation content of the consultation plan is dependent on the building, but typically includes:

- Functionality, build quality and impact (including aesthetics).
- Provision of appropriate internal and external facilities (for future building occupants and visitors or users).
- Management and operational implications.
- Maintenance resources implications.

- Impacts on the local community, e.g. local traffic or transportation impact.
- Opportunities for shared use of facilities and infrastructure with the community or appropriate stakeholders.
- Compliance with statutory (national or local) consultation requirements.
- Energy use and sustainability measures.
- Implementing principles and processes that deliver an inclusive and accessible design.
- How the building or grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to the needs of a diverse range of, students and other users, including people of all abilities.
- The end users' broad requirements for labs facilities, including appropriate sizing, optimisation and integration of equipment and systems.

7.0 ENE 04 - PASSIVE DESIGN & LZC REPORT

RIBA Stage 2

Iceni provided a **Passive Design report** at RIBA Stage 2.

Iceni also provided an **LZC Feasibility Study** at RIBA Stage 2. If a full report is not issued at this stage, then at the very least, issue any commentary issued to date relating to LZC technologies (e.g. in Stage 2 report). This report can be combined with the passive design report.

Passive design

Brief statements on approach to passive design analysis to cover:

- Site location.
- Site weather.
- Microclimate.
- Building layout.
- Building orientation.
- Building form.
- Building fabric.
- Thermal mass or other fabric thermal storage.
- Building occupancy type.
- Daylighting strategy.
- Ventilation strategy.
- Adaptation to climate change.

LZC Low and Zero Carbon Feasibility Report

The LZC report must establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy sources for the building or development, based on the feasibility study.

The LZC report must quantify the reduced regulated carbon dioxide (CO_2-eq) emissions resulting from the LZC technologies.

The low and zero carbon feasibility study to cover as a minimum:

- Energy generated from LZC energy source per year.
- Carbon dioxide savings from LZC energy source per year.
- Life cycle cost of the potential specification, accounting for payback.
- Local planning criteria, including land use and noise.
- Feasibility of exporting heat or electricity from the system.
- Any available grants.
- All technologies appropriate to the site and energy demand of the development.
- Energy storage.
- Reasons for excluding other technologies.

If appropriate:

- The building is connected to an existing local community CHP system OR
- The building is connected to an existing source of waste heat or power OR
- A building or site CHP system is specified with the potential to export excess heat or power via a local community energy scheme or a source of waste heat or power is specified with the potential to export excess heat or power via a local community energy scheme.

8.0 TRA 01 - TRAVEL PLAN

RIBA Stage 2

Mayer Brown produced a **BREEAM compliant Travel Assessment and Travel Plan**.

The travel assessment or statement to cover as a minimum:

- Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities, if relevant.
- Travel patterns and transport impact of future building users.
- Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children).
- Reporting of the number and type of existing accessible amenities, within 500m of the site
- Disabled access (accounting for varying levels of disability and visual impairment).
- Calculation of the existing public transport Accessibility Index (AI), in accordance with the BREEAM Methodology (SCS to assist if needed).
- Current facilities for cyclists.

The travel plan must be produced based on the transport assessment. This must include a package of measures specifically aiming to reduce single occupancy car travel.

All of the following must be discussed in the travel plan, although only the feasible measures put forward for the project:

- Negotiation with local bus, train or tram companies an increase in the local service provision for the development.
- Provision of a public transport information system in a publicly accessible area.
- Provision of electric recharging stations.
- Provision of parking priority spaces for car sharers.
- Consultation with the local authority on the state of the local cycling network and on improvements.
- Provision of dedicated and convenient cycle storage.
- Provision of cyclists' facilities.
- Lighting, landscaping and shelter to create pleasant pedestrian and public transport waiting areas.
- Restrictions or charging for car parking.
- Pedestrian and cyclist friendly (for all types of user regardless of the level of mobility or visual impairment) with the provision of cycle lanes, safe crossing points, direct routes, appropriate tactile surfaces, good lighting and signposting to other amenities, public transport nodes and adjoining off-site pedestrian and cycle routes.
- Provision of suitable taxi drop-off or waiting areas.

9.0 WST 05 - ADAPTATION TO CLIMATE CHANGE

RIBA Stage 2

A Climate Change Adaptation Strategy appraisal was conducted for structural and fabric resilience by the end of Concept Design (RIBA Stage 2 or equivalent).

This appraisal must be a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages:

- Hazard identification.
- Hazard assessment.
- Risk estimation.
- Risk evaluation.

- Risk management.

10.0 WST 06 - DISASSEMBLY AND ADAPTATION

RIBA Stage 2

An ease of disassembly and the Functional Adaptation Study of potential of different design scenarios is conducted by the end of Concept Design.

The study to consider the following as a minimum:

Adaptation

- Feasibility: The likelihood to contain multiple or alternative building uses, area functions and different tenancies over the expected life cycle, e.g. related to the structural design of the building.
- Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building, e.g. panels in floors and walls that can be removed without affecting the structure, providing lifting beams and hoists. Accessibility also involves access to local services, such as local power, data infrastructure etc.
- Versatility: The degree of adaptability of the internal environment to accommodate changes in working practices.
- Adaptability: The potential of the building ventilation strategy to adapt to future building occupant needs and climatic scenarios.
- Convertibility: The degree of adaptability of the internal physical space and external shell to accommodate changes of in-use.
- Expandability: The potential for the building to be extended, horizontally or vertically.
- 'Refurbishment potential': The potential for major refurbishment, including replacing the façade.

Disassembly

- Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building, e.g. panels in floors and walls that can be removed without affecting the structure, providing lifting beams and hoists. Accessibility also involves access to local services, such as local power, data infrastructure etc.
- Durability: use materials which require less frequent maintenance, repair or replacement, considering them within the context of the life span of the building.
- Exposed and reversible connections: making the connections more visible provides opportunities to optimise material and product reuse. Welded connections prohibit disassembly and it is preferable to use screws and bolts to allow for disassembly and material reuse.

- Layer independence: designing building systems and components in layers so that removal, adjustment or replacement of some elements is feasible, especially when different components have different life spans and maintenance needs.
- Avoidance of unnecessary toxic treatments and finishes. Some finishes can contaminate the substrate in a way that they are no longer reusable or recyclable. This should be avoided unless finishes serve a specific purpose.
- Standardisation can accommodate reuse and upgrading. It involves aspects such as dimensions, components, connections and modularity.

Note: Adoption of the recommended measures will need to be proved at RIBA Stage 4. Any omissions must be robustly justified.

11.0 MAT 06: MATERIALS EFFICIENCY

RIBA Stage 2

Opportunities for reducing waste and increasing materials efficiency to be captured in a report.

Examples of suitable material efficiency design measures can include:

- Increasing the utilisation factor of structural members
- Designing to standard material dimensions to reduce off-cuts and waste on site
- Removing redundant materials from the design
- Using materials that can be recycled or reused at the end of their service life
- Making use of recycled or reclaimed materials
- Designing for deconstruction and material reuse
- Using pre-fabricated elements where appropriate to reduce material waste
- Consider using an 'exposed thermal mass' design strategy to reduce finishes
- Avoiding over-specification of predicted loads
- Using lightweight structural design strategies
- Making use of bespoke structural elements where this will reduce overall material use
- 'Rationalisation' of structural elements
- Optimising the foundation design for embodied environmental impact
- Can the design, form and layout be simplified without compromising the design concept?
- Can the design be coordinated to avoid or minimise excess cutting and jointing of materials that generate waste?
- Is the building designed to standard material dimensions?

- Can the range of materials required be standardised to encourage reuse of offcuts?
- Is there repetition and coordination of the design, to reduce the number of variables and allow for operational refinement (e.g. reusing formwork)?