

Measures sign-off:

Please provide document titles within appropriate section to show material efficiency measures per stage:

RIBA Stage	1	2	3	4	5
Architect	FCH inputs reports: - Strategy	FCH inputs Drawings and reports: - Façades - GAs - Strategy	Pending	Pending	Pending
MEP	-	FCH inputs Drawings and reports: - GAs - Strategy	Pending	Pending	Pending
Structural	-	Pending	Pending	Pending	Pending
Contractor	-	Pending	Pending	Pending	Pending

Example evidence includes:

- Meeting notes
- Reports (Preparation and brief)
- File note
- Drawing showing standardization measures
- Drawing showing reuse of materials on site
- Pre fit-out waste audit
- Value engineering (With caution)

Documents can be combined to represent stages.

Examples given in manual:

BREEAM Refurbishment and Fit-out assessment parts	Example material efficiency considerations	Design Team Response
All assessment parts	• Can existing elements be reused, preferably on-site? • Can materials with a high recycled content be used? • Consider the waste hierarchy for waste materials removed as part of the refurbishment	• Existing elements cannot be reused because the existing materials are not in a suitable condition or are not suitable for the proposed design. • Much of the fabric that will be removed is historic and will have therefore already exceeded its original design life expectancy. • Re-use existing bricks to make repairs to retained brickwork. Excess salvaged bricks could be recycled on other projects. • New products containing recycled materials would be encouraged on the project where they meet the specified performance requirements, examples might include blockwork, sheet metals, glazing etc. • As part of the BREEAM Assessment, a pre-demolition audit will be completed to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. • Virgin aggregates are low-carbon to produce, but they are heavy, which means that transport can have a large impact on their total embodied

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BREEAM Refurbishment and Fit-out assessment parts	Example material efficiency considerations	Design Team Response
		carbon. Recycled aggregates will be specified only if the contractor can confirm they are locally sourced and will have a reduced embodied carbon compared to locally sourced virgin aggregates.
Parts 2 and 3: Core and local services	- Pipework: use of materials with a high recycled content - Ventilation systems and ductwork: consider changes to design to minimise the need for ventilation systems, position of air handling units closer to ventilated spaces to minimise length in ductwork, consider use of fabric ductwork to replace galvanised steel.	M&E services incorporating recycled materials should be considered.
Part 4: Interior design	- Floor coverings: can existing floor coverings be reused on or off-site? - Partitions and ceilings: can existing ceilings and partitions be reused? If not, consider adjusting sizes of partitions to minimise offcuts of material or removable partitions that can be reused	Partitions and ceilings cannot be reused.

Example measures

Architect:

- The use of Unitised facades opens a wider range of design variations within the facade structure, with a mix of panel sizes, colours and materials proposed.

The following are advantages of Unitised façade design and construction.

- Aesthetics – offers a wide variety of aesthetic variations with the use of varying combinations of finishes, infills, external feature caps and glazing specification.
- Shorter lead times – helps contractors meet shorter programme times, and can achieve reductions in time on site of up to 70%
- Increase safety on site – units can be installed without the need to work at a height on scaffolding.
- Reduced storage and handling of materials on site – advantage on this site where space and access are restricted.
- Precision engineered in a controlled production environment ensuring quality of facade systems are significantly improved
- Less wastage – waste control measures are more stringent in a factory environment resulting in reduced costs from wastage, loss, and damage.

We are currently reviewing the size of the brick modules within the cladding, to minimise onsite cutting.

- Our scope of work is for Shell and Core only therefore the extent of internal finishes is limited to the Core areas. The main office areas will not have a finished ceiling or raised access floor fitted as part of the Shell and Core works, therefore, this will reduce material wastage when they are fitted out.

MEP

- With the improvements to the fabric and glazing, there is a significant reduction in the building's heating and cooling loads

which in turn has reduced the following:

- size of the heating and cooling plant
 - reduction in pipework sizes and all ancillary components
 - reduction in insulation volume required due to the smaller pipe sizes
 - reduction in the size of heating and cooling equipment such as fan coil units and radiators
 - reduction in primary energy demand resulting in smaller LV switchgear
- Mechanical plant and equipment are being efficiently sized to meet the building's requirements avoiding excessive material and equipment. The proposed MEP services is being modelled in BIM Revit Software, which also assists with routing and co-ordinating multiple MEP services with the structure to minimise the amount required thus optimising material efficiency.
 - High efficiency LED artificial lighting is being specified and industry approved lighting calculation software is being used to determine the most efficient configuration to avoid excessive number of lighting units whilst still meeting the services strategy design requirements. As LED lighting has a longer lifespan than conventional light fittings it benefits in reducing the maintenance of light fittings and replacement requirements

General		
CN4	Evidence requirements	BRE has avoided being overly prescriptive with the evidence requirements for this issue, recognising that this is a complex environmental and design issue, where solutions and approaches are largely influenced by building specific factors. The evidence required to demonstrate compliance will vary according to RIBA stage. A few examples have been provided below: • Reports (at Preparation and Brief stage) outlining the activity relating to material efficiency (ideas discussed, analysis and decisions taken) • Drawings or building information model (BIM), calculations showing reduction of material use through design (Concept Design/Developed Design stages) • Meeting notes, construction program, responsibilities schedule (indicating parties consulted). For further guidance, examples of material efficiency measures have been provided in Table 60, along with an example of how material efficiency could be considered through the RIBA plan of works in Table 61 The BREEAM assessor should use their judgement in determining whether the aim and intent of the credit has been met using appropriate project information to back their judgement. BRE Global Limited will endorse the BREEAM assessor's judgement through the Quality Assurance audit where a reasonable justification to award the credit based on project team actions and proposed design solutions is evident.