



EAUC Annual Conference University of Leeds 23 – 25 March 2015

CHALLENGING CONNECTIONS

Incorporating the Student Sustainability Summit, Further Education Sustainability Summit and Transformational Leadership Summit

Workshop 10: Quick wins for greening existing buildings using BREEAM

Gavin Summerson, BREEAM Future Products Manager, BRE Global



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CarbonCredentials



EAUC Annual Conference University of Leeds 23 – 25 March 2015

CHALLENGING CONNECTIONS

Quick wins for greening
existing buildings using

BREEAM[®]

Gavin Summerson, Future products
development manager

Conference Sponsor



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**Estates and
Operations**



Quick wins for greening existing buildings using BREEAM



Estates and
Operations



- **Overview of BREEAM Existing Buildings schemes**
 - **BREEAM In-Use**
 - **BREEAM Refurbishment and Fit-out**
- **Quick wins for greening your existing estate**

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BREEAM ratings on this campus



Estates and
Operations



The BREEAM Excellent, St Marks Student residences



The BREEAM Excellent 'The Edge', Sports and Physical Activity, University of Leeds,



The BREEAM Very Good
'Innovation Hub', U of Leeds

BREEAM projects



Estates and
Operations



Explore BREEAM

EXPLORE THE DATA BEHIND BREEAM PROJECTS

Explore

Listings

Maps

Data

Data Lab

Explore

425,000+
Certificates

1,900,000+
Registered Buildings

60+
Countries

For more information on BREEAM statistics see: [The Digest of BREEAM Assessment Statistics Vol 01 2014](#)



LISTINGS

Access lists of licensed BREEAM assessors



MAPS

Browse certified projects by location. Scroll



DATA

Browse performance data and



DATA LAB

Access raw BREEAM and built environment



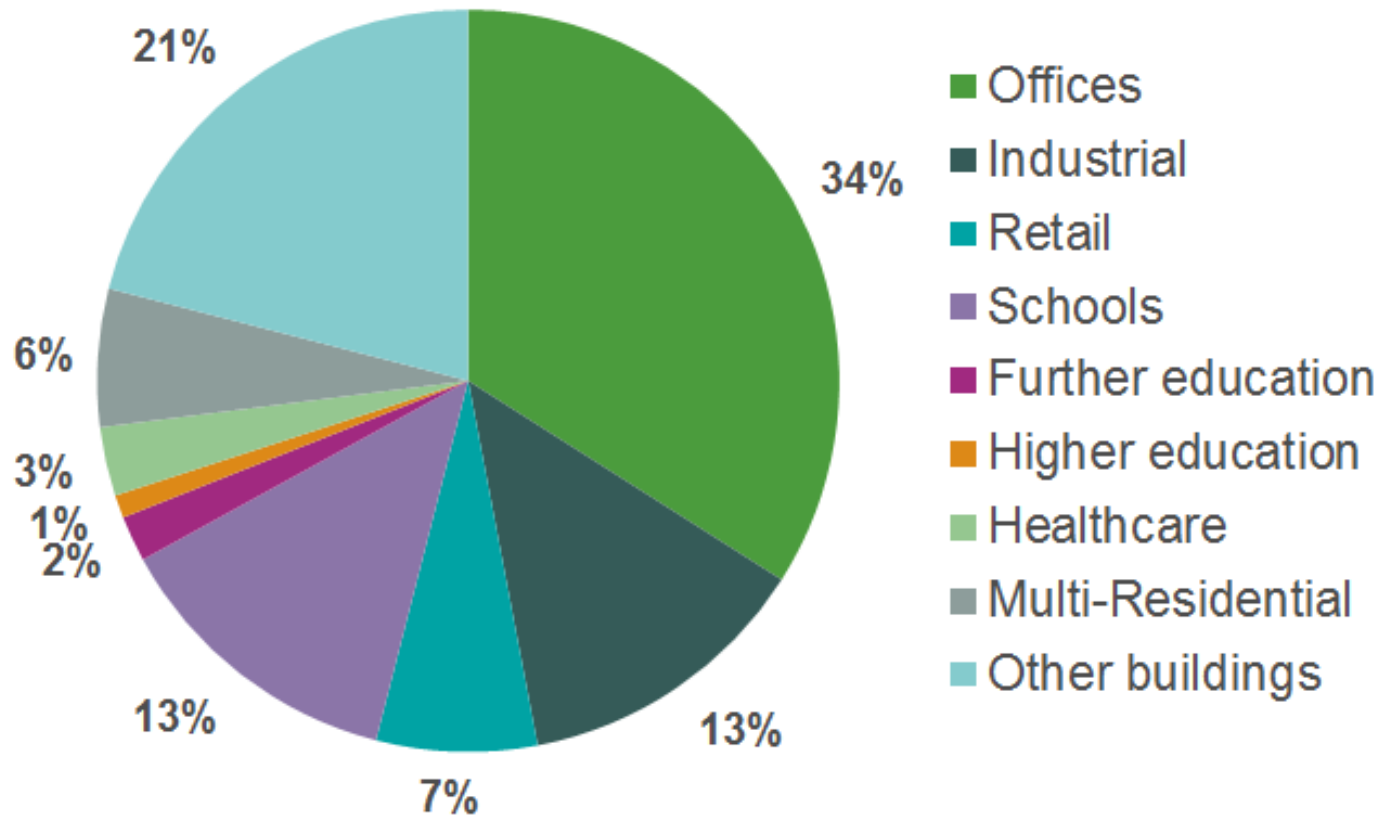
BREEAM Buildings



Estates and
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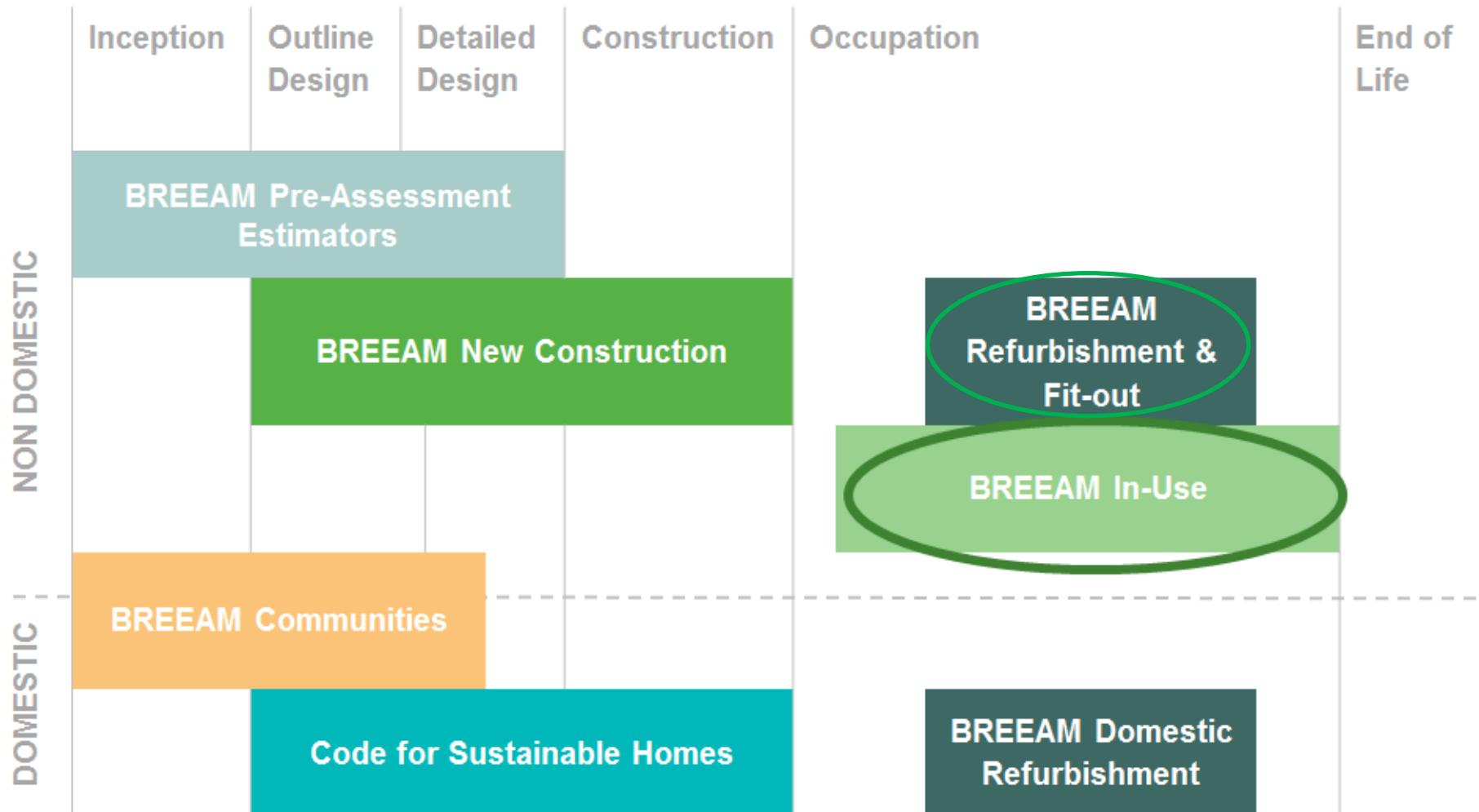
16% of BREEAM buildings from Education sector



BREEAM – Whole building lifecycle assessment



Estates and
Operations



The performance gap

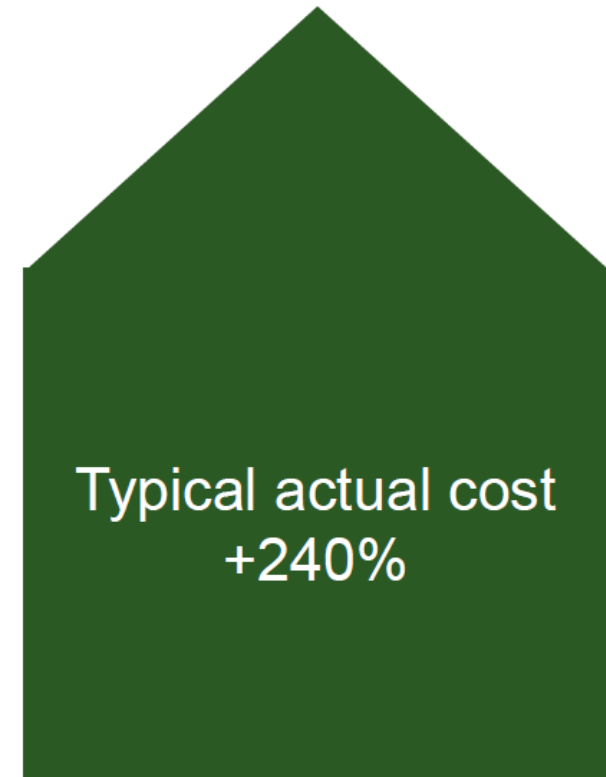
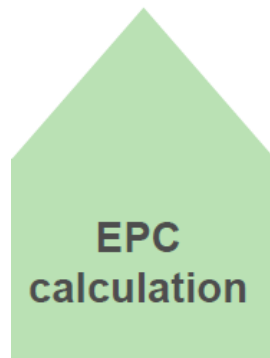


Estates and
Operations



Why don't buildings perform as designed?

- In-accurate modelling at the design stage
- Additional unregulated loads not modelled
- Design imperfections
- Poor building/occupier management
- In-adequate commissioning



The case for refurbishment



Estates and
Operations



- University of Bradford Library Building
- £1.7 million cost
- Revolving Green Fund
- Improved DEC rating from E to B
- Saved £100k in energy costs per annum
- More students using the building as a result of improvements

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The University of Bradford
Improving the DEC rating from E to A
for a library building for £1.7 million

The Revolving Green Fund (RGF) is a partnership fund between the Higher Education Funding Council for England (HEFCE) and Salix Finance Ltd. The Revolving Green Fund makes capital available to universities for investment to reduce greenhouse emissions within their building portfolio. The University of Bradford has used RGF funding to improve the energy performance of its 1970's library building. As a result of this the Display Energy Certificate (DEC) rating for the J B Priestley Library has been raised from Band E to B at a fraction of the cost of a new build library. Additional measures have subsequently been implemented to further improve the rating.

Location	Bradford, West Yorkshire
Measures Implemented	Refurbishment of existing 1970s university library building
Cost	£1.7million
Savings (£/annum)	~£100,000 (at £0.03/kWh (gas) and £0.12/kWh (electricity))
Savings (tCO ₂ /annum)	834
Simple Payback Period	<5 years

The University

The University of Bradford is a plate glass university – one of several universities founded in the United Kingdom in the 1960s – and received its Royal Charter in 1966. It has two campuses: the main campus located in the centre of Bradford and the School of Management located on the outskirts of the city. The majority of the buildings at the University are over 40 years old.

The University of Bradford has undertaken a number of projects in recent years, to reduce carbon emissions, these include:

- improving the building management system and integration of plant shut down strategies
- changing the behaviour of staff and students
- installing a large Combined Heat and Power Plant (which will deliver an annual saving of 1,900tCO₂)

The University of Bradford's Carbon Management Plan sets out the University's carbon reduction targets as shown in Table 1, against the 2005 baseline levels. The Carbon Management Plan also includes details of plans to reduce carbon emissions by improving the energy performance of buildings on the campus. These include the construction of new BREAM 'Outstanding' student accommodation and refurbishing the 1970s J B Priestley Library.

	2015	2020
Carbon reduction target (%)	54%	75%

Table 1 University of Bradford's carbon reduction targets



SALIX
SECURING SMART EFFICIENCY FINANCE FOR THE PUBLIC SECTOR

UNIVERSITY of
BRADFORD

HEFCE
HIGHER EDUCATION
FUNDING COUNCIL
FOR ENGLAND

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Greening existing buildings with BREEAM



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Operations



Step 1: Measure

Measure performance of your estate (baseline) through BREEAM In-Use

Step 2: Plan

Identify areas for improvement (quick wins) using BREEAM In-Use

Step 3: Implement

Use BREEAM Refurbishment and BREEAM In-use as a framework to facilitate improvement in:

- asset and refurbishment performance
- facilities management
- organisational effectiveness

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Step 4: Re-measures

Post refurbishment use BREEAM In-Use to re-measures building at occupancy stage

Step 5: Optimise performance

Through: commissioning, remediation, user engagement, building management, organisational policies etc.

Step 6: Implement continual improvement

Continue to measures and improve and consider further improvements to wider estate

Step 1: Measure: introduction to BREEAM In-Use



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What is BREEAM In Use?



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- Environmental assessment method for **existing (in-use) non-domestic buildings**
- Standard, **easy-to-use** assessment methodology and **independent** certification process
- On-going assessment method to encourage **continual improvements**
- Improves environmental performance and **building management**
- Assist in identifying performance of property portfolio

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- Allows assessment of buildings at:
 1. Asset level
 2. Building management level
 3. Occupier level

Providing an overall picture of environmental performance

- Helps highlight quick wins and more strategic improvements across the property portfolio



Asset Performance (Part 1)

- Assessment of the structure of the building and fixtures and fittings

Building Management (Part 2)

- Assessment of how the building is managed (facility management)

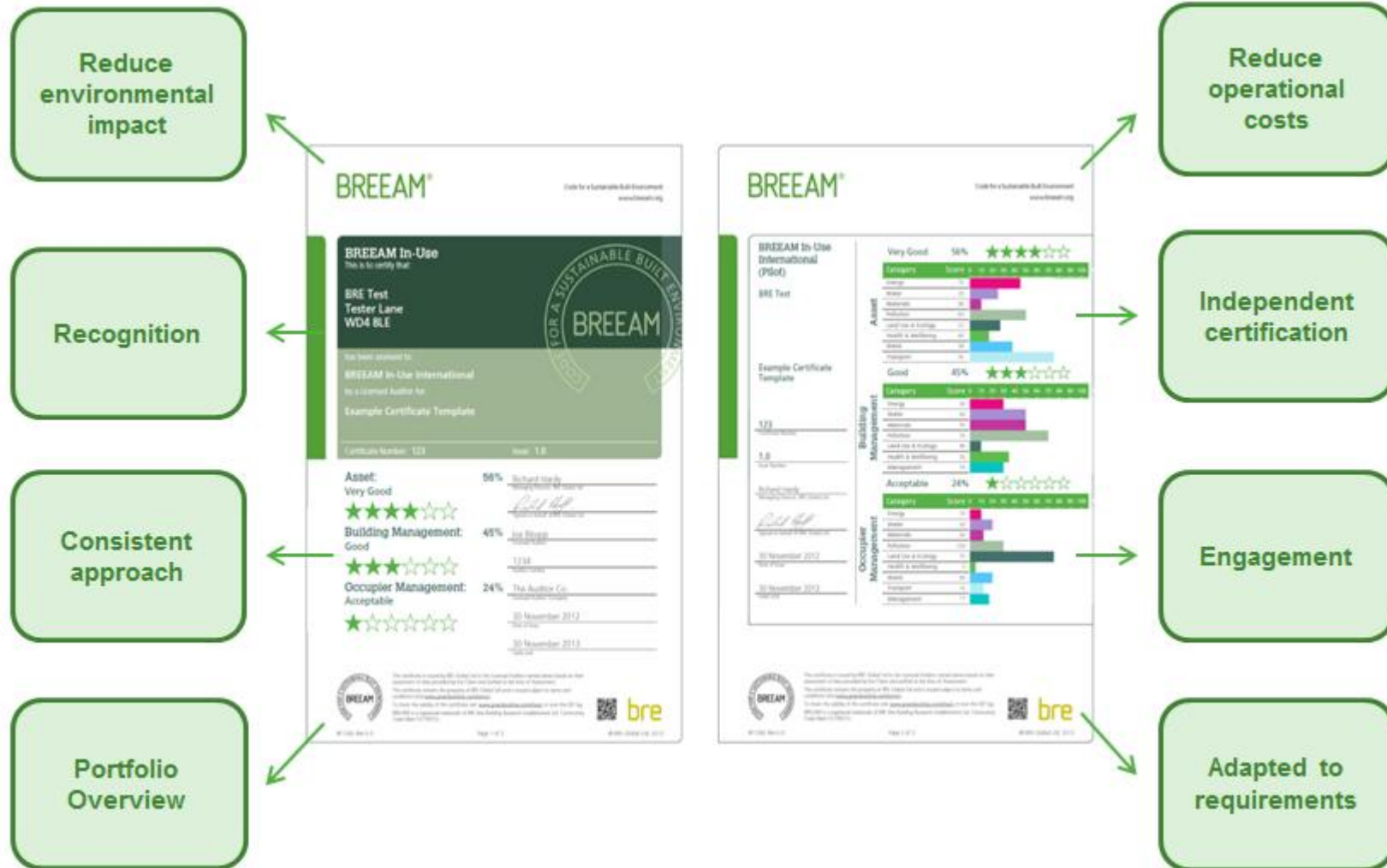
Occupier Management (Part 3)

- Assessment of the organisation's overall policies and activities that are conducted within the building

Benefits of BREEAM In Use



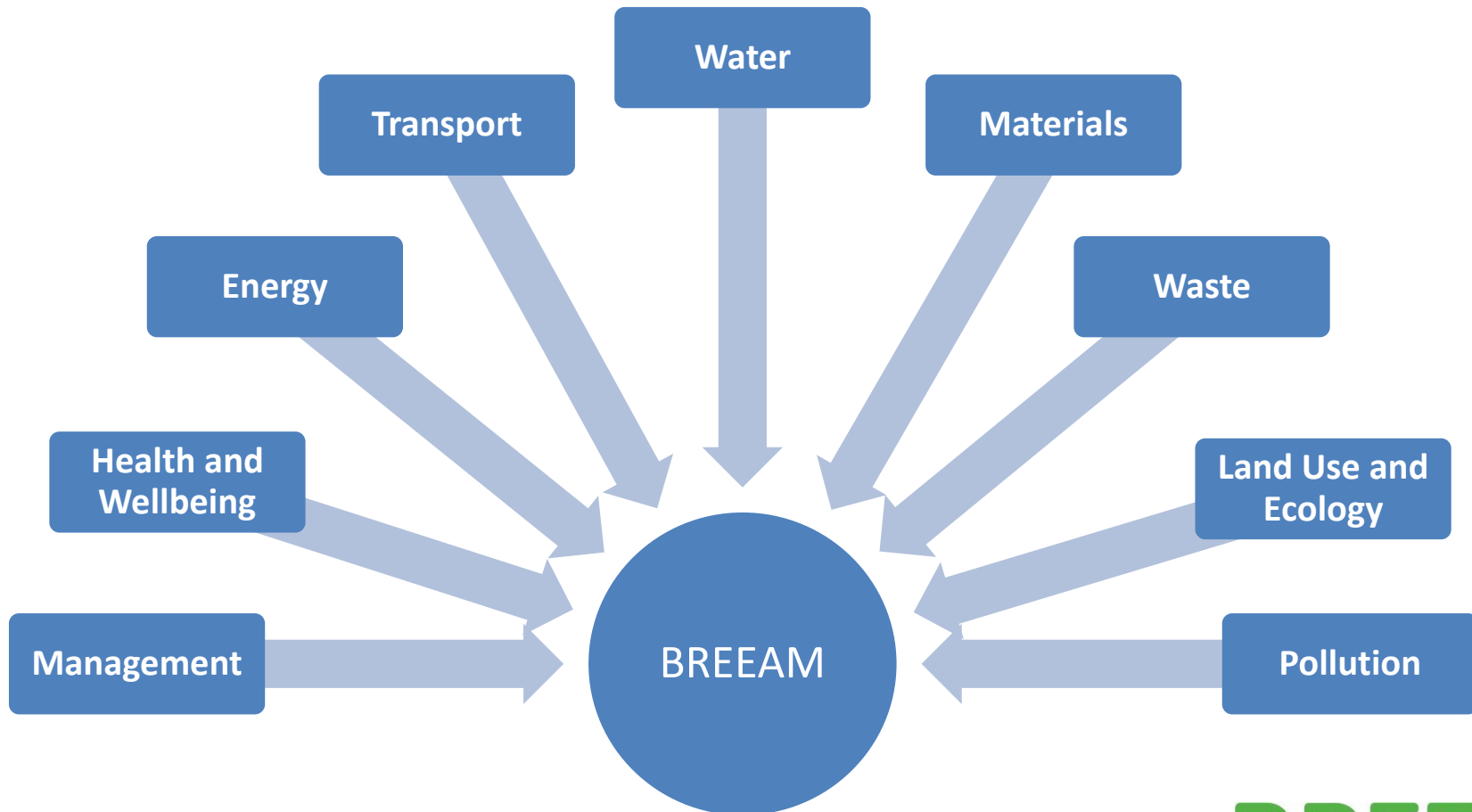
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BREEAM In-Use Categories



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BREEAM In-Use ratings



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BREEAM In-Use Star Ratings, ranging from 1 to 6 stars.

Score	Rating	Star rating
<10%	UNCLASSIFIED	–
>10%	ACCEPTABLE	★
>25%	PASS	★ ★
>40%	GOOD	★ ★ ★
>55%	VERY GOOD	★ ★ ★ ★
>70%	EXCELLENT	★ ★ ★ ★ ★
>85%	OUTSTANDING	★ ★ ★ ★ ★ ★

Integration of other standards



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ISO 14001: Environmental Management Systems

ISO 50001: Energy Management

ISO 9001: Quality Management

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BREEAM In-Use International online tool



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BREEAM-In-Use International

biuinternationalbeta.bre.co.uk/Home/Login

Search

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BREEAM In-Use International

bre

Help

Log in

Register

Welcome to BREEAM In-Use International

Driving sustainability through existing buildings

Log into BREEAM In-Use International

The tool you are trying to access requires you to register with BREEAM In-Use International

New user? Please click [here to register](#)

Already registered with us? Please enter your Username and Password below:

About BREEAM In-Use International

Welcome to BREEAM In-Use, the assessment and certification scheme designed to optimise building performance for social, environmental and economic benefit.

It covers the major environmental issues that affect buildings throughout their operational life and captures data across nine key

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Example asset performance questions



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Do occupants have personal control over temperature in their area of work?

Basic Building Details

Questionnaire

Scoring Outputs

Asset Performance

Health & Wellbeing

Energy

Transport

Water

Materials

Waste

Land Use and Ecology

Pollution

Building Management

Health & Wellbeing

HEA01 : What percentage of the building envelope is glazed?

Question not answered

Question not answered

Don't know

<1%

>1 to <=10%

>10%

Manage Evidence

Show Notes

HEA03 : Do occupants of the asset have personal control over the temperature in their work area?

Question not answered

Manage Evidence

Show Notes

Example building management questions



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- Has a building users guide been made accessible to all building users?
- Is there a notice board or display present that displays information relating to the performance of the asset?

You are here [Home](#) > [Portfolio List](#) > [BREEAM](#) > [Headquarters](#) > [AST0000000015](#)

[Basic Building Details](#) | [Questionnaire](#) | [Scoring Outputs](#)

[Asset Performance](#) ▾

[Building Management](#) ▲

- [Management](#)
- [Health & Wellbeing](#)
- [Energy](#)
- [Water](#)
- [Materials](#)
- [Land Use and Ecology](#)
- [Pollution](#)

[Occupier](#) ▾

- [Management](#)
- [Resource Consumption](#)

Management

MAN01 : Has relevant information from the building user guide been made accessible to all building users?

Question not answered ▾ [Manage Evidence](#)

Question not answered

Don't know

No

Yes

Issues reported to the management

Question not answered ▾ [Manage Evidence](#)

[Show Notes](#)

MAN03 : Is a notice board or display area present within the asset to provide staff and visitors with information relating to the environmental policies and/or performance of the asset?

Question not answered ▾ [Manage Evidence](#)

[Show Notes](#)

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Example occupier management questions



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- Is there an environmental management policy and/or procedure in place?
- To what extent are water management arrangements in place that allow monitoring against set targets?

You are here [Home](#) > [Portfolio List](#) > [BREEAM](#) > [Headquarters](#) > [AST0000000015](#)

Basic Building Details **Questionnaire** Scoring Outputs

Asset Performance ▾

Building Management ▾

Occupier Management ▴

Management

Health & Wellbeing

Energy

Transport

Water

Materials

Waste

Land Use and Ecology

Pollution

Resource Consumption ▾

Management

MAN14 : Is there an environmental management policy and/or procedure in place?

Question not answered

Question not answered

There is no environmental policy and/or procedure

An environmental policy and/or procedure is under development

An environmental policy and/or procedure is under development with a <= 2 year endorsement plan

An environmental policy and/or procedure is in place and has been endorsed by the board of directors/senior management

☐ Pollution reduction/control

☐ Reductions in the carbon footprint of business travel

☐ Responsible purchasing of products and services

☐ Reductions in the carbon footprint of staff commuting

☐ Decision processes which actively promote more sustainable purchasing practices including consideration of cost, time and quality

☐ Decision processes which address environmental and sustainability issues alongside cost, time and quality when planning capital expenditure

☐ Decision processes which address environmental and sustainability issues alongside cost, time and quality when planning accommodation requirements

☐ Measurements of company carbon footprint against a verifiable system in kgCO2/m2

☐ Land use, ecology and biodiversity

☐ Environmental policy in use as a minimum standard for all sub-contractors

☐ Policy to offset carbon emission

☐ Promotion of flexible working arrangements to reduce unnecessary travel

☐ Promotion of home working arrangements to reduce unnecessary travel

☐ Other

Manage Evidence

Measure/manage? Assumption contained within

Show Notes

BREEAM In-Use verification



Estates and
Operations



- Once the assessment is completed a BREEAM In-Use score can be requested/viewed
- This unverified score can be used to review asset performance or highlight areas for improvement
- Another option at this stage is to certify these outputs by using a BREEAM In-Use licensed assessor
- The assessor will independently verify data entered into the online questionnaire via a site visit
- Following a successful site visit the assessor can request the certificate from BRE

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BREEAM Refurbishment and Fit-out



Estates and
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BREEAM for Refurbishment and Fit-out

- Went live 31st October 2014
- Follows 2 years of development
- Draft scheme published and consultation from 19th July 2014
- Replaces 2008 scheme for refurbishment from midnight on 16th February 2015
- ‘Go live’ 31st October for manual, tools, assessments and registrations



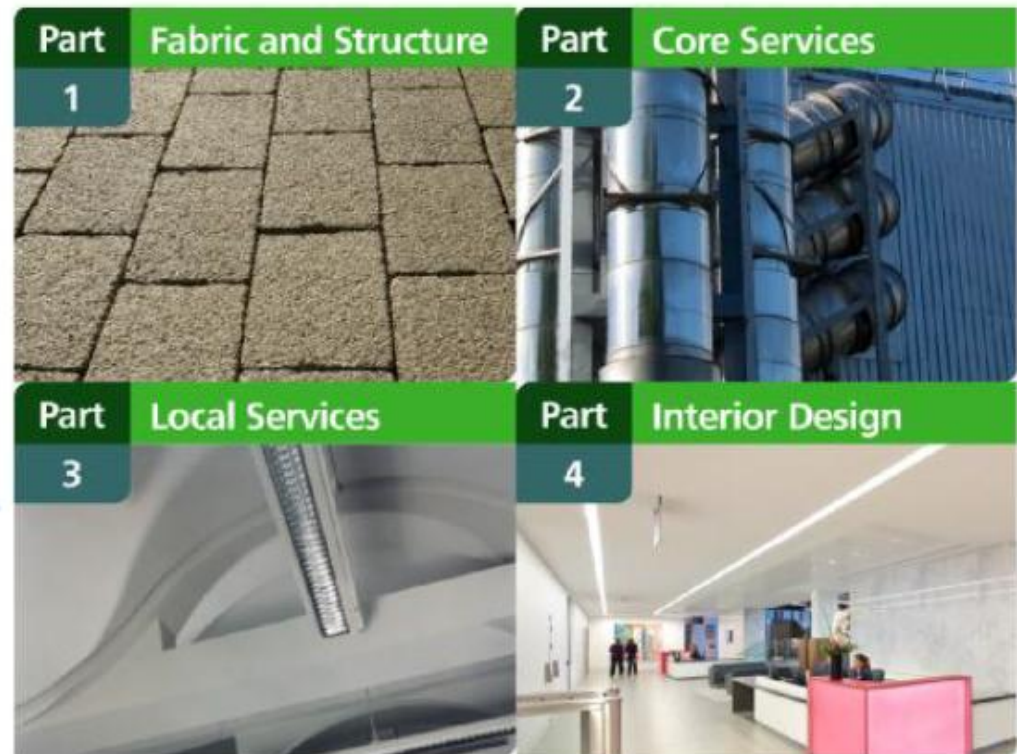
Quick wins for greening existing buildings using BREEAM



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- Modular structure with a mix and match type approach
- Clients can gain certification against the parts relevant to their scope of work
- Provides flexibility
- Provides comparability across the property market



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Project types



**Estates and
Operations**



Project type	Part 1: Fabric and Structure	Part 2: Core services	Part 3: Local services	Part 4: Interior design
Full refurbishment	✓	✓	✓	✓
Shell & Core	✓	✓		
Fit-out / re-fit			✓	✓
Interior refresh				✓
Upgrade of central services		✓		

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Online tool



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Operations



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BREEAM Refurbishment and Fit-out: Register your assessments here from the 31st of October 2014

Getting Started with BREEAM Projects - BETA

WELCOME

Welcome to BREEAM projects, the one stop shop for assessing and certifying your project against BREEAM.

If you're a BREEAM assessment user, visit

REGISTER FOR YOUR FREE ACCOUNT

Already registered? [Log in here](#)

WHAT YOU GET

Signing up will give you access to the information and tools you need to apply BREEAM to your project. You'll get access to performance data from certified projects to help communicate strategies, an area where you can create and

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- Assesses performance based upon the influence a project has over building energy performance

Part 1 Fabric and Structure

1



- Fabric U values
- Infiltration rates

Part 2 Core Services

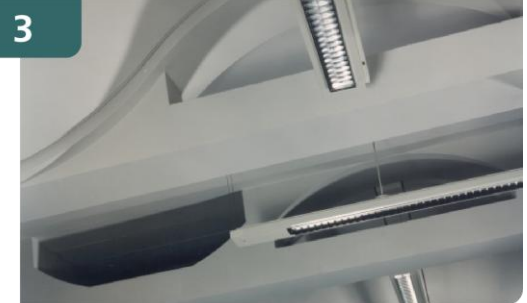
2



- Heat generation
- Cooling generation
- Distribution systems
- Air handling units etc.

Part 3 Local Services

3



- Lighting
- Local heating
- Local hot water
- Local cooling
- Local ventilation
- Controls

Energy tool demo



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Ventilation - Refurbished

What is the specific fan power for air handling systems?

What are the results of duct and air handling leakage tests?

Unknown
Class A
Class B
Other

What are the ventilation controls in accordance with the recommendations outlined in the Non-Domestic
Services Compliance Guide?

In what year was the main ventilation system replaced (if known)?

Heating - Refurbished

What is the main generation type for space heating?

Boiler
Heat pump or reversible chiller
Direct electricity
Other on site
Heat generated offsite
Other

or, other generation type, please enter efficiency, if known (enter as a

For heat pump generation type, please enter Coefficient of Performance (COP), if known

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Waste



Wst 01
Project waste
management

4 credits



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- A significant area to focus on for interior refurbishment

3 credits

- Conducting a Pre-refurbishment audit prior to strip-out
- 2 credits for direct re-use of materials onsite, offsite or closed-loop recycling
 - e.g. returning ceiling tiles to ceiling tile manufacturer for closed loop recycling

Heritage buildings



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Key finding: Heritage buildings tend to out-perform standard refurbishment projects and almost perform as well as new build projects!

- Outlines the common challenges and solutions for heritage buildings in achieving high BREEAM ratings
- Includes example solutions from case study buildings

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Briefing Paper

Sustainable Refurbishment of Heritage Buildings – Can BREEAM help to deliver it?

Kiruthiga Balson, Gavin Summerson and Steven Stenlund



Benefits of BREEAM Refurbishment



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- Flexible whilst being transparent about your scope of works
- Can be used for all building types (including mixed new build / refurb)
- Provides comparability between projects
- Empathetic with historic buildings e.g. grade 1, 2, 2* listed buildings
- Helps save operating costs and reduce risk
- Minimises water use, CO2 emissions and waste
- Enhances occupant comfort and increase productivity

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Summary



Estates and
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- Big savings can be made from improving your existing estate through, using BREEAM as a catalyst
 1. Understanding current performance using BREEAM In Use
 2. Identifying actions for improvement
 3. Making improvements to building and occupier management
 4. Delivering best practice refurbishment and fit-out programmes using BREEAM refurbishment and Fit-out

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Operations**



Thanks

Find out more at www.breeam.com/inuse
www.breeam.com/ndrefurb2014
www.breeam.com/projects

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