BREEAM UNCOVERED: LIFE CYCLE COSTING (LCC)

On April 21st 2015, UK-GBC and BRE held a joint event with guest speakers Anthony Waterman (ADW Developments), Simon Rainsford (Envision Sustainability), Kathryn Bourke (Whole Life Ltd) to find out more about approaches to scoring the Life Cycle Costing credits within BREEAM rating standard.

Introduction

LCC is a method which addresses the economic “pillar” of sustainability. It allows for the design team to predict and assess the cost performance of constructed assets and their constitute elements over the life cycle of the building to make informed specification decisions. The overall capital cost is most frequently used as an indicator of cost performance and often decisions are taken without consideration of maintenance and upkeep regimes for given element specifications. This information adds significant value to the decision maker when considering how best to minimise risk. UK-GBC sees life cycle costing as an important and effective way of ensuring a project implements long term cost saving decisions over specifying short term capital cost savings. This ensures the end user/customer doesn’t have to manage and maintain a resource intensive building that may have initially saved the client money.

BREEAM & LCC

- BREEAM New Construction 2014 – 4 credits
- First credit deadline is at the end of Stage 2. Remaining credits are available later.
- LCC is often overlooked as a strategic credit and is done on an ad hoc basis. The insights it can give the client are often undervalued.
- “Utility Life” is the main unit of measurement.
- In BREEAM 2014, the period of analysis can be specified in accordance with the client’s requirements.
- Operation, maintenance and end of life costs are all included in LCC

Benefits of LCC

- LCC is not just a numeric exercise. It can provide high level, strategic information. At a deeper level, it can provide greater detail and accuracy on which to base decisions.
- LCC can be very useful in drawing out comparisons of components to demonstrate how decreasing capital costs may not save money in long term.
- Visualisation of the life cycle replacement schedule and the maintenance regimes required as well as relationships between components and building energy costs
- Typically, there is a trade-off between other credits and costs. LCC offers a saving.

Disadvantages of LCC

- LCC is currently considered to be the last thing to address – there is uncertainty on how to apply it to projects.
- In owner-operator models, the builder has a much greater vested interest than speculative investor (feedback loops and tenant interest are missing). This is something that needs addressing as this issue can add value to a speculative developer in respect to delivering an ‘optimised’ asset to their end client.
Considerations

- Operational conditions must be accounted for i.e. school use will have different impact on materials compared to office use.
- The life cycle replacement of the capital items i.e. the materials themselves, windows, floor finishes etc, is a proportion of lifecycle costing and benchmarks can be used to test accuracy.
- Discounting of capital costs over the life cycle is not taken into account
- Many materials/assets fail prematurely due to bad construction or detailing.
- LCC should be done in conjunction with the design team in order to do appraisals.
- There needs to be something that gives an output that is applicable/implementable and can be sold into the sustainability plan.
- LCC should be done as early in the design stage as possible to maximise the outcome and have a positive influence on the design specifications. At a whole building level, it creates a strategic opportunity to change a major design issue that can save millions at operational stages. When projects still have a risk of not achieving planning permission, LCC can be done at a whole building level. There is an opportunity to do component analysis after Stage 2.
- Speculative investors need a “reward” for a low operations tenant in order to value the LCC exercise. Investors can value knowing how to answer the question “Do you have any idea how much this building is going to cost to run?”
- Component/system options – if the LCC assessor is remote from the design teams, the onus is on the assessor to select good examples for the design team. Choose positive examples and include one energy consuming system as a comparison.
- Interdependencies – check with the design teams and architects to know whether components should be grouped. They can inform of interdependencies and the substitution effects of alternative designs.
- Clients may think LCC assessors will try to influence the design in order to reduce lifecycle costs and increase capital expenditure. This is not always the case e.g. analysis on floor covering which was rejected from a design perspective.

LCC Tools

- BCIS tool (subscription required) – used for whole life assessment
  - Uses typical costs. Avoid feeding “raw” costs into your project
  - Very quick
  - Doesn’t supply assessors with the dependency cycles or maintenance activities required.
  - Supplies basic graphics
  - Administration costs are included, whereas these are not always required by BREEAM
  - No discounting is applied.
  - Pays to have access to other BCIS tools

- IES VE IMPACT Tool
  - Allows detailed assumptions
  - Improved transparency in comparison to the BCIS tool

- Click the link to find more LCC tools on [UKGBC Pinpoint’s LCC tag](https://www.ukgbc.org)
**LIFE CYCLE COSTING Q&A SESSION WITH BRE**

*Please note that the examples provided have been assessed by an independent BRE Global licensed assessor, and reviewed by BRE Global Limited through its quality assurance protocols, as being in compliance with the requirements of the BREEAM UK NC 2014 technical criteria (SD5076: V1 – Fully fitted Education). Other reports / formats may also meet these requirements, subject to assessment on a project by project basis by an independent BRE Global licensed assessor, and reviewed by BRE Global Limited.*

**Elemental LCC analysis**

1. If the project is past stage 2 (concept design), can an elemental life cycle cost analysis still be conducted and the two credits awarded?

We require that certain activities be addressed by specific project stages to ensure that the outcomes of the exercise(s) have the maximum opportunity to positively steer / influence the specification / project for the lowest possible cost (i.e. without having to re-engineer plans / proposals). However, in the context of this issue, there may be some instances where the elemental cost analysis could still add maximum value at a later stage and therefore the 2 credits still awarded. Any instance such as this would be reviewed on a case by case basis via our technical query service. A licensed assessor is able to access this service.

2. Criteria 2 requires multiple cash flow scenario’s, does the modelling have to be shown over 15, 20, 30 AND 50+ years?

Criteria 2a asks for multiple cash flow scenarios and then gives EXAMPLES of 20, 30 and 50+. In most cases the output model would show the costs for each element across the course of the expected life span of the building. For info, attached is an example elemental LCC analysis output showing the cash flow scenarios across 50 years*. However, the various scenarios depicted can be informed by the client’s brief i.e. the buildings life span is expected to be 40 years with major replacements at 10 and 20 years.

Criteria 2b specifically requires a 15 year period to be shown for fabric and services (where applicable). Fabric and services typically undertake major replacements during / around this time. As depicted in the attached example, in most cases this scenario would be shown as standard.

**Component LCC Plan**

3. In previous versions of the scheme (2008 and 2011), the criteria has stated that 2 of the 4 component types should be considered in the plan. In 2014, the criteria suggests that all 4 components (when within the scope of the assessment) be analysed. Is this correct?

Yes. During the 2014 update, our consultation focused on ensuring that there was a ‘value’ to clients in addressing this issue. It was agreed (between ourselves and our consulting experts) that we should ‘boost’ the credit value of the elemental credits to reflect the importance of early evaluation and also minimise the risk of design teams / clients avoiding more significant elements for comparison when developing the component plan (thus increasing its potential to add value / present savings on specifications).