Introducing the New Standards for Life Cycle Costing in Construction

BS ISO 15686-5:2008 for LCC and the New UK Supplements

Stockholm Conference
Friday 27th November 2009

Presented by
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New standards for LIFE CYCLE COSTING

Overview of the presentation ....

1 Introduction the BS ISO standard for LCC and the UK supplements
   • Why are they needed?
   • What do they contain?
   • When should they be used?
   • Benefits of using the documents

2 Helping to eliminate confusion over scoping LCC commissions ....

3 Practical guidance and instructions on how to undertake LCC at key stages of the construction procurement and during in use (lifetime) ...

4 Industry support to enable LCC to become widely used in practice.

5 Costing the future – achieving VFM through sustainable development
COSTING THE FUTURE;
Securing Value for Money through Sustainable Procurement

INDUSTRY CONSULTATION....
Conclusions and Recommendations:

1. Defining sustainable procurement
2. Whole life budgeting
3. Whole life costing
4. Leadership and guidance
5. Measuring success
6. Best procurement practice
“Whilst the majority of the industry now recognise that whole life costing is the basis for getting best value for money in public sector construction procurement – there are 4 key barriers to making this happen in practice”:

1. Confusion over scoping and terminology – i.e. WLC, LCC and LCA
2. Lack of a common methodology and UK standard cost data structure
3. Lack of ability to present information to enable project stakeholders to understand the inter relationship between costs (over the whole life), time and design quality and also take account of wider environmental (notably energy performance and CO2 emissions) and also social aspects
4. Lack of tangible evidence and the know-how (skills) to make it happen!
What is the ISO 15686 SERIES of STANDARDS

ISO 15686  Service life planning - Buildings and constructed assets

Part 1 – General principles – technical assessments
Part 2 -  Service life prediction procedures
Part 3 – Performance audits & reviews
Part 4 -  Data structure
Part 5 -  Life cycle costing
Part 6 -  Environmental impact assessments
Part 7 -  Service life data evaluation from practice
Part 8 -  Reference service life data and estimation
Part 9 -  Guidance on assessment of service life data
Part 10  Functionality requirements and serviceability
Part 5 covers life cycle costing;

• **Definitions**, terminology and abbreviations

• **Principles** of life cycle costing – i.e. purpose and scope; what costs to include/exclude; typical forms and level of LCC analysis at key stages; outputs

• **Forms of LCC calculations** and six methods of economic evaluation (with informative examples)

• **Setting the scope for LCC studies** including how to deal with risks and uncertainty

• **How LCC forms part of the whole life costing** business investment option appraisal process

• **Reporting and analysis techniques**
ISO addresses the confusion over terminology – regarding the difference between whole life cost (WLC) and life cycle cost (LCC)

Note – Occupancy costs included in non construction costs in BS ISO 15686-5
### Menu of life cycle costs and whole life cycle costs

<table>
<thead>
<tr>
<th>LIFE CYCLE COSTS</th>
<th>INCLUDE/EXCLUDE</th>
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<tbody>
<tr>
<td>1. Construction costs</td>
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<td>1.1 Construction works costs (see Annex A2 SFCA)</td>
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<td>1.2 Other construction related costs</td>
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<td>1.3 Client definable costs</td>
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<td>2. Maintenance costs</td>
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<td>2.1 Major replacement costs</td>
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<td>2.2 Subsequent refurbishment and adaptation costs</td>
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<td>2.3 Redecorations</td>
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<td>2.4 Minor replacement, repairs and maintenance costs</td>
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<td>2.5 Unscheduled replacement, repairs and maintenance costs</td>
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<td>2.6 Grounds maintenance</td>
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<td>2.7 Client definable costs</td>
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<td>3. Operation costs</td>
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<td>3.1 Cleaning costs</td>
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<td>3.1.1 Windows and external surfaces</td>
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<td>3.1.2 Internal cleaning</td>
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<td>3.1.3 Specialist cleaning</td>
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<td>3.1.4 External works cleaning</td>
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<td>3.2 Utilities costs</td>
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<td>3.2.1 Fuel</td>
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<td>3.2.2 Water and drainage</td>
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<td>3.3 Administrative costs</td>
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<td>3.3.1 Property management</td>
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<td>3.3.2 Staff engaged in servicing the building</td>
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<td>3.3.3 Waste management/disposal</td>
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<td>3.4 Overheads costs</td>
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<td>3.5 Taxes (if applicable)</td>
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<tr>
<td>3.6 Client definable costs</td>
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<td>4. Occupancy costs</td>
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<td>4.1 Internal moves (churn)</td>
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<td>4.2 Reception and customer hosting</td>
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What is life cycle costing?

Definitions in the BS ISO 15685:5 is:

*Life cycle costing* .... is a methodology for the systematic economic evaluation of the life cycle costs over the period of analysis, as defined in the agreed scope ...

*Whole life costing* .. is a methodology for the systematic economic consideration of all the whole life costs and benefits over the period of analysis, as defined in the agreed scope ...
Why a UK supplement was produced?

To enable LCC to become widely used in the UK CONSTRUCTION INDUSTRY!

1. Develop a UK standard cost data structure for LCC that aligns the ISO data structure with the **BCIS standard form of cost analysis** – and with international total occupancy costs (ITOC) (Section 3 and Annex B & Annex C).

2. **Instructions** on how to define the **client’s specific requirements** for LCC studies: forms of outputs & evaluation method (Section 2&4).

3. Provides **worked examples** of how to apply LCC at key stages in construction procurement i.e. budget setting; whole building option level and at system or component level appraisals. (Section 4 and Annex D1,D2 and D3).
UK Supplement to the ISO for LIFE CYCLE COSTING

Why a UK supplement was produced

To enable LCC to become widely used in the UK CONSTRUCTION INDUSTRY!

4 What **risks and uncertainties** need to been addressed – including an example LCC **risk log** and guidance on various **sensitivity analysis** and factoring techniques (Section 6 and ANNEX E).

5 **Menu** of the WLC/LCC - in/out (ANNEX A)

6 Forms for **life cycle costing analysis** - to facilitate a more accurate, consistent and robust application of future LCC estimations and option appraisals (ANNEX F).

7 Information and data assumptions (s7) **Sources of information** (ANNEX G)

Principal supporting organizations:
UK Standard LCC Data Structure

Whole Life Cost (WLC)
- Non Construction Costs
- Income
- Externalities

Life Cycle Cost (LCC)
- Construction
- Maintenance
- Operation
- Occupancy
- End of Life

Principal supporting organizations:
Information and data sources
When to do WLC and LCC at key stages of a building or constructed asset’s life cycle
UK Supplement to the ISO for LIFE CYCLE COSTING

Applications

OUTLINE OF THE LIFE CYCLE COSTING PROCESS AND PROCEDURES

Key Decision: Business Justification, Procurement strategy, Concept Approval, Design approval

RIBA: Preparation, Design, Construction

Plan of Work: Appraisal, Design Brief, Concept Design, Development, Technical Design

Process Stage: Budget, Option appraisals

Principal supporting organizations:

BCIS

FAITHFUL GOULD

BSI
What does it contain?

- **Business case**, - for doing LCC in use
- **Process** – generic framework and guidance
- **Asset structures** – facilities assessments
- **Cost accounting** – finance and budgeting
- **Environmental factors** – carbon reduction commitment and wider sustainability issues
- **Risks and uncertainty** – guidance
- **Sources of information** - reference data
- **Reporting and analysis techniques**
How LCC links to Sustainability

**Key point to note!**

**Links with wider sustainability assessments**; - the SMLCC provides clear boundaries of what the LCC economic evaluation covers and explains how this fits with other forms of assessments.

**LCC is about costs:**
LCC may form part of a wider whole life costing and costing a sustainable development assessment *(the triple bottom line)*

**Common issue** and conflict is the balance between *‘affordability and sustainable development’*
The figure below shows key decisions about the concept of the building form and orientation can achieve real sustainable environmental benefits without major additional capital costs - and positively impact on the costs in use!
### Practical Application Costing Sustainability

**PUTTING A PRICE TO A BREEAM ENVIRONMENTAL ASSESSMENT**

### ENVIRONMENTAL ASPECTS - Checklist
Optimising the service life cycle performance

#### ‘BREEAM Assessment’
- Management
- Health & Wellbeing
- Energy
- Transport
- Water
- Materials & Waste
- Land Use & Ecology
- Pollution

#### ENERGY
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<tr>
<th>Credit</th>
<th>Credit Title</th>
<th>Inception</th>
<th>Feasibility</th>
<th>Outline Proposals</th>
<th>Design</th>
<th>Detail</th>
<th>Production</th>
<th>Bill of Quantities</th>
<th>Tender</th>
<th>Action</th>
<th>Planning</th>
<th>Operations</th>
<th>Completion</th>
<th>Feedback</th>
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<tr>
<td>E01</td>
<td>Reduction of CO₂ emissions</td>
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<td>B</td>
<td>C</td>
<td>D</td>
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<tr>
<td>E02</td>
<td>Sub-metering of substantial energy uses</td>
<td>A</td>
<td>B</td>
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<td>E03</td>
<td>Free cooling</td>
<td>A</td>
<td>B</td>
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#### TRANSPORT
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<th>Outline Proposals</th>
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<th>Operations</th>
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<tr>
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<td>Provision of public transport</td>
<td>A</td>
<td>B</td>
<td>C</td>
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<td>T05</td>
<td>Cyclists facilities</td>
<td>A</td>
<td>B</td>
<td>C</td>
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<td>T06</td>
<td>Pedestrian/cyclist safety</td>
<td>A</td>
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<td>T08</td>
<td>Travel plan</td>
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<td>W01</td>
<td>Water consumption</td>
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<td>W02</td>
<td>Water meter</td>
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<td>W03</td>
<td>Major leak detection</td>
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<td>B</td>
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<td>W04</td>
<td>Sanitary supply shut-off</td>
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<td>W05</td>
<td>Water recycling</td>
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Presenting the Cost of Sustainability

- Provide 21 cycle storage spaces, changing facilities and lockers for 10% of building occupants: £1890
- Install thermostatic radiator valves on all radiators: £1367
- Provide additional luminaires in offices for zoning and separate lighting controls in classrooms: £1367
- Install high-frequency lighting ballasts to all luminaires: £5123
- Provide occupant-controlled blinds in all occupied areas: £6152
- Commissioning agent to monitor commissioning of building services: £0
- Register for Considerate Constructors’ Scheme: £400
- Provide secured access to external double-leaf door with keypad for shared facilities: £1600
- Complete site investigation: £2800
- Provide infiltration trenches in addition to permeable paving to provide a sustainable urban drainage system (SUDS): £3418
- Provide robust fittings and finishes such as bollards, kick plates and skirting: £10 526
- Provide 2 recycling bins: £600
- Replace tarmacadam with permeable paving: £6833
- Replace 50% of vinyl flooring with linoleum in circulation areas: £820
- Install 4/2 litre dual flush toilets, aerated taps and 4.5 l/min showers: £0
- Install rainwater harvesting system and provide plumbing: £6691
UK Supplement to the ISO for LIFE CYCLE COSTING

Cross Industry Collaboration

Published Document – Fantastic result of cross industry collaboration and consultation (6P’s):

1. **Policy** - HM Treasury/ Office of Government Commerce

2. **Professions** - RICS/ BCIS and CIBSE, plus CIOB and Construction Confederation and the Construction Products Association + HVCA others

3. **Procurers**
   - Defence Estates, DCSF, Home Office and the Department of Communities & Local Government

4. **Providers**
   - Consortia reps – and major PFI/PPP service providers

5. **Practitioners** - major cost consultancy organisations and independent LCC experts and insurance advisors

6. **Pan Industry bodies** - Academia
   - BSI and the B 500/3 Durability committee
   - BRE
   - Constructing Excellence
Plans to disseminate and encourage widespread use of the LCC standards:

**MAKING THINGS HAPPEN!**

**Promotion** campaign *Rethinking Standards in Construction (Constructing Excellence) + BCIS, BSi and the working group champions*

**Procurers** skilling and training programmes

**Practitioners** – living the standards in use

**Providers** PFI/PPP + traditional constructors

**Profession** – BCIS cost intelligence service RICS measurement rules, aligned to SMLCC

SUSTAINABLE PROCUREMENT
Achieving Best Whole Life Value in Practice

Key to achieving best whole life value:
1. Understand Value
2. Assessing Value
3. Putting a Cost to Value Propositions
4. Identify the Best Value Sustainable Solution – prior to commit to invest
5. Optimising Value over the Whole Asset Life Cycle (Post Occupancy Evaluations - POE)

Practical Application
WHOLE LIFE VALUE

Potential for Value Improvement
Life Cycle Cost Reductions

Procurement Life Cycle

Commit To Invest

In-Service

Project Definition/Inception
Project Options Appraisal
Design Detailing Development
Construct and Adaptation
Operate and Maintain
Renewals Salvage/Sale Decommission
Minimise costs over time
Minimise disruption to road users
Minimise impact on the environment

Whole Life Value
Educational transformation
Meet defined sustainability targets
Minimise whole life costs over time

Whole Life Value
ACHIEVING WHOLE LIFE VALUE

COSTING THE FUTURE; Securing Value for Money through Sustainable Procurement

INDUSTRY CONSULTATION

1. Defining sustainable procurement
2. Whole life budgeting
3. Whole life costing
4. Leadership and guidance
5. Measuring success
6. Best procurement practice
Option A – Aspiration Solution

No Go!
Practical Application
WHOLE LIFE VALUE

SUSTAINABLE PROCUREMENT;
Whole Life Value – Schools Option Profiling

Option B – Cost Cutting Solution

No Go!
Best Value Sustainable Solution

Go!

Comparison of Baseline v Option X

- Time
- Functionality
- Cost
- Impact
- Compliance
- Build Quality
In Conclusion …

1. Policy into **practice** … is **not** a too difficult box!

2. Embrace the new ISO and **UK standards** for ‘Life Cycle Costing in Construction Procurement’ and ‘In Use’!

3. Skilling the team to unlock whole life sustainable value

4. **YOU** can help to make it happen! ….
Introducing the New Standards for Life Cycle Costing in Construction

IN CONCLUSION

THANK YOU
For more information contact
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