Adapting to the demands of Sustainable Construction Certification

Ian Cox
Director of Construction Solutions, Aggregate Industries UK
Firstly...about me

- Name is Ian Cox
- Chartered Structural Engineer, Civil Engineer and Highway Engineer
- Director of Construction Solutions at Aggregate Industries (Holcim’s company in the UK)
- Lead a small team of Architects, Engineers and Sustainability Advisors who help Designers to achieve the most sustainable concrete
1. Types of Sustainable Construction Certification \textit{in principle}

2. Examples of Sustainable Construction Certification
   - PassivHaus
   - Responsible Sourcing
   - BREEAM

3. What lessons can we learn from all this for Slovakia...?
1. Types of Sustainable Construction Certification *in principle*
Types of Sustainable Construction Certification

- Three types of Sustainable Construction Certification
  - those that deal with Embodied Impacts
  - those that deal with Operational Impacts
  - those that deal with both

[Images illustrating Embodied Impacts and Operational Impacts]
Today’s Presentation

1. Types of Sustainable Construction Certification in principle

2. Examples of Sustainable Construction Certification
   1. PassivHaus

These are well known to you
Types of Sustainable Construction Certification

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  - those that deal with Embodied Impacts
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Embodied Impacts

Operational Impacts

PassivHaus
EU EPBD
EU Zero Carbon
Types of Sustainable Construction Certification

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  - those that deal with **Embodied** Impacts
  - those that deal with **Operational** Impacts
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Embodied Impacts

Operational Impacts

Resp Sourcing
In Responsible Sourcing certification, the processes used by product manufacturers are examined.
BRE 6001 Responsible Sourcing

Material
  - Traceability

Ethical
  - Legal Compliance
  - Employment rights
  - Health & Safety
  - Investment in employees
  - Working with local communities

Extraction/Harvesting, Manufacturing, Processing and Supply
  - Supply chain management
  - Quality management
  - Environmental management
  - Greenhouse gas emissions
  - Resource use
  - Waste management
  - Water extraction
  - Transport impacts
Responsibly Sourced Materials Credits

- Awarded at various levels
  - Pass
  - Good
  - Very Good
  - Excellent

- AI/Holcim was the first company in the world to be certificated to BES 6001

- Our UK certificate covers 296 combinations of product and production facilities and is by far the most comprehensive in the whole UK construction materials supply industry.
Types of Sustainable Construction Certification

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  - those that deal with *Embodied* Impacts
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*Embodied Impacts*  
*Operational Impacts*
So what is BREEAM?

- Environmental Certification Scheme which covers Embodied and Operational Impacts (not just Energy)
- Internationally recognised
- CERTIFIES a building by giving it a rating
  - Pass 30%
  - Good 45%
  - Very Good 55%
  - Excellent 70%
  - Outstanding 85%
- ....based on how it scores against a number of Environmental Impact Categories
Environmental Impact Categories are laid down in The Green Guide

Classification

1. Climate change
2. Water extraction
3. Mineral resource extraction
4. Stratospheric Ozone depletion
5. Human toxicity
6. Ecotoxicity to fresh water
7. Nuclear waste
8. Ecotoxicity to land
9. Waste disposal
10. Fossil fuel depletion
11. Eutrophication
12. Photochemical ozone creation
13. Acidification
The Process begins...

- All the product manufacturers are asked to provide **generic** information about the products they make through their Trade Associations.

Concrete Block Association supplies details of the processes associated with manufacturing concrete blocks.

Precast Floor Association supplies details of the processes associated with manufacturing precast concrete floors.

- amount of cement and aggregates used, amount of energy and water used by factory, etc.
Environmental Assessment

- BREEAM calculates the environmental impacts that each *generic* product has on the planet during its manufacture and over a 60 year lifespan.

- The generic product is then assigned a number of “EcoPoints”
  - the lower the number of EcoPoints the lower the impact on the environment/planet.
Products are then joined together into Elements, eg wall

- BREEAM then “joins together” the products into Elements (eg wall, floor, etc)

- ..and calculates the Ecopoints of the element (per sq m) by adding up the EcoPoints of the different materials which make up the complete element, eg blocks, mortar, insulation, render or bricks/mortar, plaster/plasterboard, paint)

- ..to arrive at the total Ecopoints (per sq m) of building the element in this way
BREEAM then calculates the environmental impacts of building the same element in other ways

- eg timber frame wall construction versus concrete block wall construction...

- ...and compares the Ecopoints of each method

- ...to arrive at a comparative “Rating” from A+ to E

...the different ratings are published on-line at www.greenguide.org.uk
BREEAM compares the environmental impact over 60 years

The Ecopoint and A+ to E ratings

- Maximum Ecopoint rating
- Minimum Ecopoint rating

Low relative environmental impact
High relative environmental impact

Protecting People, Property and the Planet
<table>
<thead>
<tr>
<th>Element type</th>
<th>Summary rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brickwork, cement mortar, cement-bonded particle board, timber frame with insulation, vapour control layer, plasterboard on battens, paint</td>
<td>A+</td>
</tr>
<tr>
<td>Brickwork, cement mortar, OSB/3 sheathing, timber frame with insulation, vapour control layer, plasterboard on battens, paint</td>
<td>A+</td>
</tr>
<tr>
<td>Brickwork, cement mortar, plywood (temperate EN 636-2) sheathing, timber frame with insulation, vapour control layer, plasterboard on battens, paint</td>
<td>A+</td>
</tr>
<tr>
<td>Reclaimed brickwork, cement mortar, OSB/3 sheathing, insulation, timber frame, vapour control layer, plasterboard on battens, paint</td>
<td>A+</td>
</tr>
<tr>
<td>Reclaimed brickwork, plywood (temperate EN 636-2) sheathing, timber frame with insulation, vapour control layer, plasterboard on battens, paint</td>
<td>A+</td>
</tr>
<tr>
<td>Brickwork outer leaf, insulation, aicrete blockwork inner leaf, cement mortar, plaster, paint</td>
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