

Assessment Tools in Sustainable Construction



Image: www.birdlife.ch/d/pm03_05_27.html



Chair of Sustainable Construction

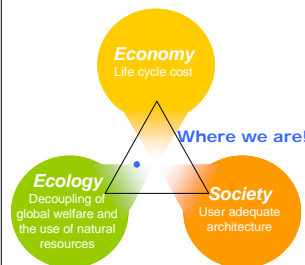
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Chair of Sustainable Construction



Levels: Materials, Buildings, Housing and Industrial Estates, Urban Areas

ETH Zurich



- Science and technology university with an outstanding research record
- Study, research and work place of 18,000 people from 80 nations
- About 350 professors in 15 departments



Structure

1. Overview over three (voluntary) different construction project assessment tools:
 - a. SNARC
 - b. SIA 112/1
 - c. SB Tool
2. SB Tool methodology
3. Adaptation / Localisation



Documentation D 0200 “SNARC”

“Systematik zur Beurteilung der Nachhaltigkeit von Architekturprojekten für den Bereich Umwelt”

- Intended for the early planning phase (architectural contests)
- Systematic analysis of environmental aspects
- Three thematic focuses:
 - Site
 - Resources
 - Operability

➤ Rough guideline covering mostly environmental issues



Reference SIA 112/1 Nachhaltiges Bauen im Hochbau

- Addressing planner and client communication in order to pinpoint strategic sustainability goals
- Covers further aspects of sustainability
 - a. Environment
 - b. Society
 - c. Economy
- Lacking indicators and benchmarks to evaluate or compare projects



SBTool

- Developed by members in more than 20 countries (iiSBE)
- Spreadsheet-based analysis software
- Allows adaptation to scope and region
- Covers 7 issues of sustainability:
 - Site selection and urban design
 - Energy and resources
 - Environmental load
 - Indoor environmental quality
 - Service quality
 - Social and economic aspects
 - Cultural aspects



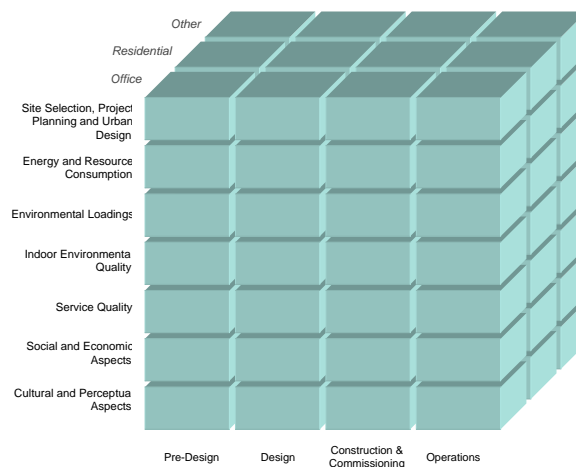
SBTool - Features

- Number and text-based benchmarks can be defined
- Custom weightings
- Easy insertion of local criteria and/or language
- Modular in scope
 - Consideration of occupancy type
 - Phase (Pre-design, design, construction, etc.)
 - New and renovation projects
- Relative and absolute result outputs

➤ **The SBTool allows a very high flexibility**



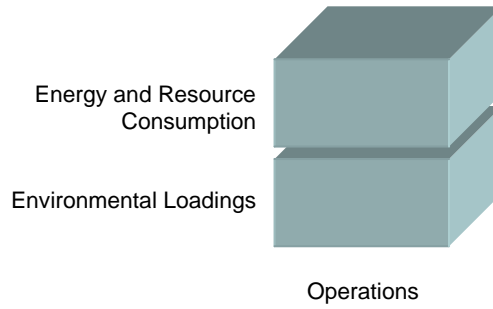
SBTool - Modules



Source: International Initiative for a Sustainable Built Environment



SBTool - Modules



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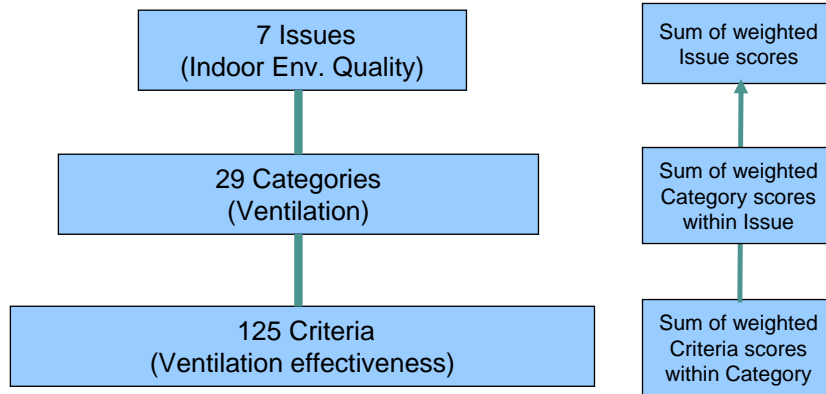
The full list of parameters is quite long...

Master List of SBTool Parameters		02 September 2006			
		Phase active			
		P-Dsn	Dsn	C&C	Ops
A Site Selection, Project Planning and Development					
A1 Site Selection					
A1.1	Pre-development ecological value or sensitivity of land.				
A1.2	Pre-development agricultural value of land.				
A1.3	Vulnerability of land to flooding.				
A1.4	Potential for development to contaminate nearby bodies of water.				
A1.5	Pre-development contamination status of land.				
A1.6	Proximity of site to public transportation.				
A1.7	Distance between site and centres of employment or residential occupancies.				
A1.8	Proximity to commercial and cultural facilities.				
A1.9	Proximity to public recreation and facilities.				
A2 Project Planning					
A2.1	Feasibility of use of renewables.				
A2.2	Use of Integrated Design Process.				
A2.3	Potential environmental impact of development or re-development.				
A2.4	Provision of surface water management system.				
A2.5	Availability of potable water treatment system.				
A2.6	Availability of a split grey / potable water system.				
A2.7	Collection and recycling of solid wastes in the community or project.				
A2.8	Composting and re-use of sludge in the community or project.				
A2.9	Site orientation to maximize passive solar potential.				
A3 Urban Design and Site Development					
A3.1	Development density.				
A3.2	Provision of mixed uses within the project.				
A3.3	Encouragement of walking.				

Source: International Initiative for a Sustainable Built Environment



Structure and Scoring



Source: International Initiative for a Sustainable Built Environment



Design target scores for Megaplex project, Ottawa, Canada

Predicted performance results based on information available during Design Phase	Active Phase (set in Region file)	Design Phase																																												
<p>Relative Performance Results</p> <p>0 = Acceptable Practice; 3 = Good Practice; 5 = Best Practice</p> <p>Performance Issue Areas</p>	<p>Project Information</p> <p>This is a Renovation project with a total gross area of 7000 m². It has an estimated lifespan of 75 years, and contains the following occupancies: Apartment and Retail and is located in Ottawa, Canada. The assessment is valid for the Design Phase.</p> <p>Assumed life span is 75 years, and monetary units are in CD</p> <p>Amortization rate for embodied energy of existing materials is set at 2 %</p>	<p>Design target scores</p> <table border="1"> <tr> <td>With current context and building data, the number of active low-level parameters is:</td> <td>116</td> <td>Max. potential low-level parameters:</td> <td>118</td> </tr> <tr> <td>The number of active low-level mandatory parameters with a score of less than 3 is:</td> <td>3</td> <td>Active low-level mandatory parameters:</td> <td>10</td> </tr> <tr> <td colspan="2">To see a full list of Issues, Categories and Criteria, go to the Issues worksheet.</td> <td>Active Weights</td> <td>Weighted scores</td> </tr> <tr> <td>A Site Selection, Project Planning and Development</td> <td>8%</td> <td></td> <td>3.3</td> </tr> <tr> <td>B Energy and Resource Consumption</td> <td>23%</td> <td></td> <td>2.3</td> </tr> <tr> <td>C Environmental Loadings</td> <td>27%</td> <td></td> <td>3.7</td> </tr> <tr> <td>D Indoor Environmental Quality</td> <td>18%</td> <td></td> <td>3.4</td> </tr> <tr> <td>E Service Quality</td> <td>16%</td> <td></td> <td>2.9</td> </tr> <tr> <td>F Social and Economic aspects</td> <td>5%</td> <td></td> <td>2.9</td> </tr> <tr> <td>G Cultural and Perceptual Aspects</td> <td>3%</td> <td></td> <td>4.3</td> </tr> <tr> <td colspan="2">Total weighted building score</td> <td></td> <td>3.1</td> </tr> </table>	With current context and building data, the number of active low-level parameters is:	116	Max. potential low-level parameters:	118	The number of active low-level mandatory parameters with a score of less than 3 is:	3	Active low-level mandatory parameters:	10	To see a full list of Issues, Categories and Criteria, go to the Issues worksheet.		Active Weights	Weighted scores	A Site Selection, Project Planning and Development	8%		3.3	B Energy and Resource Consumption	23%		2.3	C Environmental Loadings	27%		3.7	D Indoor Environmental Quality	18%		3.4	E Service Quality	16%		2.9	F Social and Economic aspects	5%		2.9	G Cultural and Perceptual Aspects	3%		4.3	Total weighted building score			3.1
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<p>Design Phase scores indicate Potential Performance as predicted by an assessment of building features and plans for construction and operation that are developed during the design process.</p>																																														

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Localization

- One feature of SBTool is its adaptability to specific needs (local and application)
- The Chair of Sustainable Construction is working on a localized version of the SBTool
 - Swiss conditions
 - Swiss norms
 - Language
 - Weighting system



Case study - Forum Chriesbach

EAWAG-facility “Forum Chriesbach”, Dübendorf

Results will be presented in SB08 conference in Melbourne

Images: Roger Frei, www.rogerfrei.com



The building

- Completed in June 2006
- Administrative and research building
- Strong focus on sustainability issues
- Best practice construction

Images: Roger Frei, www.rogerfrei.com



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