

Building environment design: energy conservation and efficiency

by Stephen Turner, Chair of ISO/TC 205, Building environment design

The scope of ISO technical committee ISO/TC 205 is standardization in the design of new buildings and retrofit of existing buildings for acceptable thermal and visual comfort, indoor air quality, and energy conservation. Because of this scope, the committee treats the employment of materials and techniques in their optimal way in the design of buildings, which is intricately related to overall sustainability in building design. The unique opportunity afforded ISO/TC 205 is the holistic treatment of the many aspects of building environment design, that ultimately helps to determine the indoor environment. Since these aspects are often standardized at the national level in disparate technical committees and standards, TC 205 has the opportunity of

delivering standards in several closely related sub disciplines. If these standards respect and explore the interrelatedness of these sub-disciplines, better buildings will result.

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Furthermore, the work of ISO/TC 205 recognizes that architectural engineering – the design of building systems – can no longer be undertaken separately from the overall design of buildings. The system of standards under development is intended to integrate both across engineering sub disciplines, and to vertically integrate archi-

tectural engineering with the entire building design process. With the standards developed by ISO/TC 205 providing the proper framework, the results of this integration can be buildings that respect the greater environment and provide safe and comfortable indoor environments.

The activities of ISO/TC 205 recently led to the discovery of a remarkable coincidence. Mr. Kisung Cho, Director General of the Department of Safety and Service Standards, Korean Agency for Technology and Standards, hosted our recent meetings in November 2005, in Seoul, Korea, together with the country's Ministry of Commerce, Industry & Energy. In his warm greeting welcoming us to Seoul, he told the story of restoring the Cheonggyecheon, a river in downtown Seoul, after decades of being covered by urban streets. In my response, I was moved to talk also of a recently uncovered urban river in Providence, Rhode Island, USA, the

birthplace of the American industrial revolution and my home today.

Having realized the consequences of inattention to nature, two cities on opposite sides of the world have recently undertaken redress. Similarly, the mistakes of the past in building design cannot be sustained into the future. The mistakes of the 1970's can inform us today. Energy efficiency alone is not a worthy goal, if it results

Instead of buildings that attempt to suppress and overcome nature, why not design buildings that integrate with the environment, on every possible level? The international standardization work which ISO/TC 205 performs seeks, in addition to lowering trade barriers for engineering design, to promote and facilitate the design of high performance buildings: higher performing as economic assets for their owners, high-



in dissatisfied and unproductive occupants. To ensure the future, buildings must respect the environment by minimizing their impact on the external environment whilst providing safe and comfortable indoor environments. The restored rivers ran through our conversation as poignant examples of right action with respect to the environment. What a powerful metaphor for architectural engineering, where sustainability is an essential goal!

er performing as buildings that provide amenable indoor environment for their occupants, and higher performing with respect to resource utilization and environmental impact.

ISO/TC 205 is organized into six active working groups, with two additional task groups currently evaluating future work items. Truly an international effort, the convenorships are distributed amongst Australia, Egypt, Republic of Korea, the United Kingdom, and the USA.

The three I's in sustainability

The Brundtland Commission¹⁾ of the United Nations stated that development is sustainable "...if it meets the needs of the present without compromising the ability of future generations to meet their own needs."²⁾ ISO/TC 205 is seeking to standardize building environment design, including several aspects of sustainability and environmental responsibility. Its working group WG 1, *General Principles*, has developed a design process standard that was approved for final draft (FDIS) stage at our plenary session in Seoul. This process standard defines interactive, iterative design stages to target and achieve integrated performance targets. The process is inter-

1) In 1987, the World Commission on Environment and Development published a report, which came to be known as the "Brundtland Report". It presented the concept of global sustainable development, with guiding principles for sustainable development as it is known today.

2) ASHRAE. 2003. ASHRAE GreenGuide. Atlanta: American Society of Heating Refrigeration and Air-Conditioning Engineers, Inc.

3) ASHRAE 2004. Advanced Energy Design Guide For Small Office Buildings. Atlanta: American Society of Heating Refrigeration and Air-Conditioning Engineers, Inc.

About the author



Stephen Turner is the Chair of ISO/TC 205, *Building environment design*, serving from 2005 to 2007. In the USA, he chairs the committee for the American National Stand-

ards Institute and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 55: 2004, *Thermal environmental conditions for human occupancy*, and sits on the Rhode Island Building code commission. He specializes in building commissioning, campus utility systems and construction standards as mechanical engineer at Brown University.