

ASHRAE/USGBC/IESNA Standard 189 on High-Performance Green Buildings

by John Hogan, AIA, P.E., and Steve Ferguson

In early 2006, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); the U.S. Green Building Council (USGBC); and the Illuminating Engineering Society of North America (IESNA) embarked on a project to develop a standard for high-performance green buildings that would apply to all buildings except low-rise residential buildings (i.e., condominiums and apartment buildings three stories or less in height). This summer saw the fruits of this effort when ASHRAE/USGBC/IESNA Proposed Standard 189, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, was made available for public review.

The document is written in mandatory language, with Code Council staff acting as consultants to the Standard Project Committee, providing guidance on format and structure. The intent is for the increasing number of public and private organizations that use a green building rating system like LEED (Leadership in Energy and Environmental Design) to adopt Standard 189 as a baseline and, in the broader perspective, help project green building practices into mainstream consciousness.

Coordination with National Initiatives

The Standard 189 Project Committee (SPC 189) sought to incorporate criteria that will support current initiatives including, but not limited to, the following.

U.S. Federal Agencies

Through a 2006 memorandum of understanding, available online at www.epa.gov/greeningepa/content/sustainable_mou_508.pdf, 16 U.S. federal agencies have agreed to:

- reduce the energy cost budget for new buildings by 30 percent compared to ASHRAE/IESNA 90.1-2004, *Energy Standard for Buildings Except Low-Rise Residential Buildings*;

- use a minimum of 20-percent less indoor potable water than the Energy Policy Act of 1992 fixture performance requirements and reduce outdoor potable water consumption by a minimum of 50 percent over that “consumed by conventional means”;
- specify materials and products such as adhesives, sealants, paints, carpet systems and furnishings with low pollutant emissions; and
- “use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10 percent (based on cost) of the total value of the materials in the project.”

The American Institute of Architects

In 2005, the American Institute of Architects adopted a position statement on high-performance buildings, available at www.aia.org/SiteObjects/files/HPB_position_statements.pdf, that they achieve a minimum 50-percent reduction from the current level of consumption of fossil fuels used to construct and operate new and renovated buildings by the year 2010.

The U.S. Conference of Mayors

The U.S. Conference of Mayors passed a 2006 resolution whereby:

- new city buildings will achieve a minimum delivered fossil fuel energy consumption performance standard of one-half the U.S. average for the building type; and
- Conference members will work to increase the fossil fuel reduction standard for all new buildings in their jurisdictions to 60 percent by 2010, 70 percent by 2015, 80 percent by 2020 and 90 percent by 2025, with the end goal being to have all new buildings be “carbon-neutral” (use no fossil fuel greenhouse-gas-emitting energy to operate) by 2030.

The full text of the “2030 Challenge” is posted online at www.usmayors.org/climateprotection.

Scope

Standard 189 addresses the same five major topic areas as the LEED rating systems—sustainable site development, water savings, energy efficiency, the effect of materials selection on the atmosphere and natural resources, and indoor environmental quality—and is intended to apply to the same categories of buildings covered by the *International Energy Conservation Code* (IECC) and ASHRAE/IESNA 90.1—residential buildings more than three stories in height and all nonresidential buildings.

Overview of Requirements

Also similar to the IECC and ASHRAE/IESNA 90.1, Standard 189 contains a series of mandatory provisions applicable to all projects as well as additional prescriptive and performance options for compliance.

Sustainable Sites

- Construction to take place on appropriate sites.
- Site development to provide means for managing and controlling stormwater.
- Projects to take steps to reduce heat islands to minimize the impact on the microclimate.
- Projects to reduce light pollution through luminaire cutoff requirements and outdoor lighting trespass limits.

Water Efficiency

- Site water use reduction through bio-diverse plantings, hydrozoning and smart irrigation controllers. Prescriptive and performance options would limit the area of landscape to be irrigated with potable water.
- Building water use reduction (generally, 20-percent lower than the 1992 U.S. Energy Policy Act) through criteria for plumbing fixtures and fittings, appliances, and HVAC systems and equipment. Prescriptive and performance options address water use in commercial food service and laboratory facilities.
- Requirements for meters, meter data collection, and data storage and retrieval to allow for informed operation of water systems.

Energy Efficiency

- Use of ENERGY STAR rated equipment and appliances.
- Projects to have a minimum percentage of on-site renewable energy power.
- Requirements for meters, meter data collection, and data storage and

retrieval to allow for informed operation of energy systems.

- Prescriptive option to achieve approximately 30-percent energy savings over current IECC and ASHRAE/IESNA 90.1 requirements.
- Performance option to address both annual energy cost and annual carbon dioxide equivalent.

Materials Selection

- Construction debris to be salvaged or diverted from landfill.
- Prescriptive option for reduced-impact materials to either have 10-percent recycled content, be 15-percent regionally processed or be 5-percent bio-based.
- Performance option for life cycle assessment.

Indoor Environmental Quality

- Additional outside air for offices and schools in accordance with prevailing ventilation codes or standards.
- Carbon dioxide monitoring for both mechanically ventilated and naturally ventilated spaces.
- Projects to comply with the thermal comfort criteria of ASHRAE 55, *Thermal Environmental Conditions for Human Occupancy*.
- Minimum sound transmission class (STC) ratings to control sound transmission from the exterior in areas with loud noises and between certain spaces.
- Daylighting through the use of skylights.

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Being Involved (continued)

with any suggestions or ideas. We anticipate active involvement in this important international association.

Looking Ahead

Since being appointed to lead these important initiatives at ICC, I have had the opportunity to travel to 11 cities in as many weeks and observe the inner workings of the organization and the sincere dedication of members and staff. I am invigorated and energized to see eyes light up with enthusiasm when I communicate the Board's vision for enhancing an already vibrant organization, and I am thoroughly impressed by the abundance of experience and genuinely believe that there is no organization with as much expertise in the field of PMG. There is a saying that "no problem can stand the assault of sustained thinking," and there is no question in my mind that there has never been a better time to focus our collective talents on the industry's ongoing and emerging issues.

While speaking at chapter meetings across the country, questions were asked about my experiences and my past.

My response—I have been in the mechanical and plumbing industry for almost 30 years. Sure, I am a tradesman. I've attained several journeyman licenses, a half-dozen contractor licenses, some inspector certifications and was a member of many associations, but I was only "in" the industry—now I am "involved."

How about you? I encourage everyone to submit applications for committees and explore the possibility of teaching courses. Are you interested in starting a plumbing chapter in your area? The opportunities to get involved are limitless, and ICC will support you completely.

With your help and involvement, we will provide a clear and concise PMG direction for the future. ♦



Jay Peters, ICC Executive Director of Plumbing and Mechanical Activities

The PMG Resource Center can be reached toll-free at 1-888-ICCSAFE (422-7233), extension 4PMG (4674), or via e-mail at PMGResourceCenter@iccsafe.org.

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- Prescriptive and performance options for daylighting by windows.
- Prescriptive and performance options for the use of low-emitting materials in building interiors.

Additional requirements address subjects related to construction operation such as building commissioning, measurement and verification, and energy use reporting; and the development of plans for transportation management, durability, erosion and sedimentation control, and indoor air quality during construction.

Conclusion

There is a broad range of potential uses and users for ASHRAE/USGBC/IESNA 189. It could be used as the baseline for an individual project; by a corporation as the minimum standard for project development; by a university as the baseline for new campus facilities; or by a municipality, county or state as the baseline for expansion and infrastructure development. It could be adopted by local jurisdictions for use as an incentive in land use or zoning codes, and more progressive localities may even decide to use it as the baseline for all future development.

What can ICC's role be in all of this? Certainly, the development and eventual completion of Standard 189 offers

an opportunity to provide critical guidance in the green building arena by considering reference in the ICC family of *International Codes*. For example, using the model of 2006 IBC Appendix E, it could be employed to provide supplemental requirements for increased energy efficiency in the IBC or IECC. ♦

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