

Aligning Regulation with Sustainability

by Yves Khawam, Ph.D.



Building regulations have developed over the centuries to protect life safety and enhance quality of life from mostly social and economic perspectives. These regulations are applied through codes which are predominantly prescriptive in nature and almost always reactive. For example, the Great Chicago Fire of 1871 spawned the requirement that buildings in proximity to property lines be provided with parapets to mitigate fire spread, and the deadly 1980 fire at the MGM Grand Hotel and Casino in Las Vegas led to new code requirements for the sealing of exiting system penetrations to prevent the passage of smoke.

While tragedies and other accident data have been the primary drivers for building and fire safety code and standard development, land use codes have mostly developed in response to quality of life issues promulgated by individual citizens or interest groups. In both cases, however, current regulations reflect a collation of many different parts which were never originally designed to work together as an integrated system. An analogy could be made to a patient on 20 different prescription drugs, none of which has been tested with the others for interactions and side effects.

The growing interest in sustainability has highlighted these issues as building permitting agencies struggle to reconcile environmentally responsible practices with the patchwork of existing prescriptive regulations. In other words, the rise in importance of environmental issues has called into question how to accommodate current regulations within the broader context of sustainability.

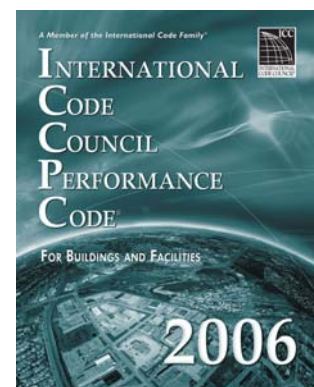
Building Safety and Land Use Standards

The International Code Council has attempted to address this problem through the *ICC Performance Code for Buildings and Facilities*, first published in 2001 and further refined in the 2006 edition, which facilitates an approach whereby design may be based on objectives without pre-

scribing a specific course of action. Among the remainder of the I-Codes, only the *International Energy Conservation Code* contains both prescriptive and complete performance-based alternatives. This gestalt approach captures the essence of the regulatory intent while leaving compliance paths open to the creativity of the human spirit and fostering innovation in design.

Another barrier to the implementation of more sustainable development is the regulatory mindset prevalent within many building departments. In all fairness, this attitude has been molded by the prescriptive nature of most building regulations, leading each individual element to seem to take on a life of its own. As a result, code officials may find themselves defending the most innocuous requirement as if without it the entire house of cards would collapse. This is, in fact, a defining characteristic of a closed system: with the threat of litigation for breach of code contract looming in the background and no other apparent viable options to fall

The stated purpose of the *ICC Performance Code for Buildings and Facilities* is "to provide appropriate health, safety, welfare, and social and economic value, while promoting initiative, flexible and responsive solutions that optimize the expenditure and consumption of resources."





back on, all that codes administrators feel they have to rely upon are prescriptive requirements.

The same not only holds true but is accentuated in land use regulation—be it comprehensive plans, development standards or zoning codes—because they are developed locally and often with great passion from divergent perspectives. Building has traditionally been more generalizable and portable than land regulation, and model codes have been embraced and used throughout the country with only minor local amendments. In contrast, each community prides itself on having its very own signature regarding land use, the codification of which is rarely generalized beyond a particular jurisdiction. This begs the question as to how to reconcile best practices for land regulation with individuality. Enter the era of sustainability. . . .

Sustainability Context

Sustainability can be measured against a triple bottom line comprising economic, social and environmental facets. A healthy community obviously requires that all three of these facets be aligned at optimal levels. What must be recognized, however, is that although the environmental component has traditionally been the least regarded, it is in fact the *sine qua non* of this tripod: while it is possible (albeit unpleasant) to survive under dismal economic and social conditions, it is manifestly impossible to survive in an environment which cannot support human life.

Consider that, worldwide, the most limiting environmental element is water. Without water, life as we know it is not possible. Furthermore, water resources are inextricably related to energy. Each kilowatt-hour of thermoelectric generation requires approximately 25 gallons of water, with additional water used for associated pollution control devices. The U.S. Geological Survey estimates that in 2000, 346 billion gallons of fresh water were used each day in the

U.S.—with thermoelectric generation accounting for approximately 39 percent of that total (exceeded only by agricultural uses, accounting for 40 percent). While only 3 percent of this withdrawal is actually consumed by the generation process, it still accounted for approximately 10.4 billion gallons per day in 2006. Hence, low performance buildings and the manufacture of building materials requiring large amounts of energy indirectly contribute to taxing our precious water resources.

In addition, the production of energy not only contributes to a large proportion of greenhouse gas emissions and other air pollutants, thus indirectly affecting economic and social sustainability, but in fact contributes much more directly to compromising our economic sustainability. Thermoelectric power generation and fossil vehicular fuels drain local economies by channeling revenues outside the community. This problem will become ever more acute as the proportion of household income dedicated to energy continues to rise due to limited availability and growing demand. Therefore, reducing building energy consumption will not only extend critical water supplies but free up a significant amount of revenue that can be invested or spent locally. Other environmental elements can also be analyzed in this manner so as to identify their social and economic fabric.

Sustainability Standards

A number of organizations have developed standards to address sustainable development. The most well-known of these is the United States Green Building Council (USGBC), which launched the LEED (Leadership in Energy and Environmental Design) rating system in 1998.

Today, LEED for New Construction and Major Renovations (LEED-NC) is the most widely regarded sustainability standard in the U.S. It is based on a set of 69 obtainable points in six categories: sustainable sites (14 possible

points), water efficiency (5 possible points), energy and atmosphere (17 possible points), materials and resources (13 possible points), indoor environmental quality (15 possible points), innovation in design (4 possible points), and accredited personnel (1 possible point). Projects earn LEED-NC certification based on the number of points obtained as follows: Certified—26–32 points; Silver—33–38 points; Gold—39–51 points; and Platinum—52–69 points.

While LEED-NC and other LEED standards like those for existing building operations and maintenance, core and shell, commercial interiors, schools, retail, and homes address sustainable site issues, the USGBC has recognized that buildings cannot be regarded in isolation of land planning. As such, it is in the process of developing LEED for Neighborhood Development (LEED-ND) to span and integrate the entire development and building process.

Although designed to supplement current regulations, sustainability standards like those promulgated by the USGBC do not mesh well with the former for two principal reasons. First, existing regulations may simply prohibit elements of the standards from being implemented. This is most prevalent in local design standards and land-use regulations in which maximum densities, allowable heights of structures, parking and road width requirements may be prescribed in a manner prohibiting the attainment of benchmarked sustainability standards. Second, as previously noted, the prescriptive nature of most building and fire safety codes does not necessarily facilitate integrative design. Therefore, in order to facilitate the full implementation of sustainability standards, there is not only a need to eliminate local regulations prohibiting sustainable elements, but application must be shifted from a prescriptive to a performance-based approach.



Moving Toward Performance-Based Regulation

The *ICC Performance Code* offers jurisdictions the opportunity to adopt and promote a systems approach to regulation. Just as important, it also provides a legal framework for the shift from a prescriptive approach without overt threat of litigation. Given the decades-old regulatory mindset, however, this is more easily said than done.

The first logical step is to distill the methods by which performance requirements should be administered. This may be readily accomplished via the administrative provisions included in the *ICC Performance Code*. However, intent is not sufficient by itself to shift staff perspectives. The next requisite step is to concentrate on purpose so as to bring to light the value of this approach. As set forth in the *ICC Performance Code*, its purpose is “to provide appropriate health, safety, welfare, and social and economic value, while promoting initiative, flexible and responsive solutions that optimize the expenditure and consumption of resources.” This provides a good ideological starting point but will need to be supplemented with a more concrete understanding of the code’s application.

Exposure to sustainability best practices is an effective catalyst for grasping and embracing the true purpose and value of performance-based regulation. This can be accomplished by providing staff access to sustainability forums and encouraging interested individuals to pursue training and accreditation in sustainability standards.

The goal is for the traditional building and fire safety department purpose—and personnel mindset—to be expanded to include principles reflecting, as my colleague David Eisenberg of the Development Center for Appropriate Technology aptly puts it, that “buildings should do no harm to their occupants *and* the environment.”

Land Planning and Development Standards

The shift to performance-based land planning and development standards can be much more complex to implement, particularly if local interest groups are intransigent over issues that conflict with community-wide sustainability best practices (i.e., building height, density and mixed use). One approach could be to use the *ICC Performance Code* administrative provisions for guidance, and then look to established sustainability standards and other best practices such as smart growth principles in order to scope the new regulatory content. This approach may allow potentially contentious issues to be cast in appropriate perspective by relegating discussion to the larger questions regarding overall goals and objectives.

Take as an example a traditional development facet: street standards. Employing the LEED-ND rating system as a reference, multiple objectives can be identified to shape a new performance-based standard, including:

- preferred location,
- reduced automobile dependence,
- provision of a streets network,
- support for a bicycle network,
- housing and jobs proximity,
- schools proximity,
- provision of an open community,
- compact development,
- reduced parking footprint,
- walkable streets,
- expansion of transit facilities,
- transportation demand management,
- access to surrounding facilities,
- access to public spaces,
- access to active spaces,
- minimization of site disturbance and
- heat island reduction.

These objectives can then be taken together as a whole to determine how best to design streets for a community, with basic structural and safety elements added using performance-based criteria.

Another approach could be to leave current regulation in place and incentivize performance-based sustainability criteria. This may be accomplished by creating sustainability overlay zones and providing developers the choice of abiding by traditional regulation or opting for the sustainability criteria. Incentives could involve processing (such as expedited permitting), cost (including deferring payment of impact fees) and marketability (including offering a sustainable community designation).

Next Steps

ICC and the USGBC entered into a memorandum of understanding on May 9 of 2007, and it is to be hoped that along with their stated intention of fostering advocacy of and education about green building, the two organizations will pursue opportunities to reconcile the I-Codes with LEED standards for more congruent applicability. Like the USGBC, ICC should also look to expand its codes and standards to address the larger development issues. Such activity could be developed within the *ICC Performance Code* or through “next-generation” consensus documents.

In any event, the need to align regulation with sustainable practices is growing day by day. Fortunately, with the support of jurisdictions large and small across the country, industry vanguards like ICC, USGBC and others are answering the challenge. ♦

Yves Khawam, Ph.D., is Chief Building Official for Pima County, Arizona. He holds ICC Master Code Professional and LEED AP certifications.