

Building Codes for a Small Planet

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Much of our work at the Development Center for Appropriate Technology (DCAT) is prompted by the conviction that the building regulatory sector needs to change in order to facilitate and promote sustainable building practices. Some of these changes need to be to the codes themselves, but what most needs to change is what we think about as we write, use and enforce them. If we could see what actually happens as a result of our decisions and actions, we would act differently and make different choices. In the process of making decisions about changes in codes or considering individual approvals of buildings, how often do we stop to consider the real consequences of what we are requiring people to do?



There is probably a pen within your reach right now. Pick it up and look at it. What do you really know about its origin? Where did the various materials used to manufacture it come from? What are their constituent chemicals, processes and byproducts? Where were they assembled and what is the waste stream like? How much energy was required to assemble the pen and get it to you? What would the map of the trips all the molecules in that pen took to arrive here in your hand today look like? What will happen when it runs out of ink or you no longer want it? Now ask these same questions about something as large and complex as a building.

When we are thinking about new requirements to improve building safety, we should also be thinking about the millions of times those changes would need to be carried out. What will flow from our decisions—not only when an affected building is being designed and built and not only at the site of the building, but throughout the lifecycles of the building and the products, materials and systems used to construct, maintain and, eventually, demolish it? These types of considerations are all-too-rarely part of the way any of us think about buildings, regardless of our roles in relation to them.

To make truly informed decisions about buildings, we need to look at the full range of consequences of our choices. There are impacts from the acquisition of all the resources needed to produce the materials, equipment and systems that go into a building; impacts from their transportation (typically interwoven with multiple stages of processing and distribution); impacts from the assembly of all those components into the building itself, including the waste generated and the energy and materials used; and impacts from the ongoing operation of the building, including heating, cooling, ventilating, lighting, maintenance, repairs, and any remodeling or redecorating that will

occur over the life of the building. Finally, we need to consider the impacts when the building reaches the end of its useful life. Will we have to deal with toxic materials? Can the building's components be disassembled and reused, or will they be destroyed or damaged in disassembly and end up in landfills, or perhaps be recycled?

Once aware of this larger set of impacts and concerns, we will recognize in many of them the potential for significant risks to public health, safety and general welfare. After we have identified these possible risks, how do we begin to incorporate them into the decision-making processes for codes? If associated with a legitimate part of building regulatory responsibility, what is the appropriate role for the building regulatory community in facilitating the process of reducing and reversing larger and longer-term risks? In particular, how can this be accomplished given that codes do not mandate what is built or how, only that the results meet minimum requirements for public health, safety and general welfare? Take, for example, energy codes and their role in supporting general welfare. Such codes are often not considered to be related to health and safety, but when considered from a life-cycle perspective building energy usage is, in fact, a pertinent concern. If we posed our previous set of life-cycle questions we would apprehend the enormity of energy use related to buildings. Such use has major environmental impacts and competes with resources for maintaining our food production and distribution systems, our transportation systems, and the other vital uses. Energy codes are therefore a legitimate life-safety matter—as central to our responsibility for protecting the public as any other aspect of the codes.

Successfully incorporating this awareness into building regulation will be an ongoing process. The first step is to fully acknowledge the risks inherent in current practices and accept the need for change. Next, we need to set goals and develop a clear vision of what sustainable building and development might look like, then envision a regulatory framework that would facilitate moving toward it as rapidly as possible. Finally, we will need to develop and implement workable strategies and mechanisms for the transition from where we are now to that vision of the future.

With the help of the International Conference of Building Officials® (ICBO) and the International Code Council® we have already begun this process. There is growing recognition of the need for change, and part of the vision and some of the transitional strategies already exist. This regular column and the three past issues of *Building Standards*™, which featured alternative materials and green building are indicative of that recognition within the building regulatory sector, and ICBO's becoming the first code group to join the U.S. Green Building Council (USGBC) further demonstrates its commitment and leadership.

In addition, regional green building programs and the USGBC's Leadership in Energy and Environmental Design (LEED) program are examples of real and effective transitional strategies and mechanisms. (Articles detailing each of which appear in the March–April, 2002, issue of *Building Standards*.) Programs like these lead us toward recognizing the full set of concerns we should consider when designing and building new buildings or renovating existing ones. They embrace a wide range of concerns including site-related issues, water conservation, energy efficiency, indoor environmental quality, materials, resource efficiency, waste reduction, recycling and reuse, and promoting integrated design processes. They also help focus attention on the whole lifecycle of buildings.

The LEED rating system has been gaining rapid acceptance as a national standard for evaluating the environmental performance of commercial and institutional buildings, and efforts are well underway to develop a LEED residential program. A number of jurisdictions (and a few government agencies such as the U.S. General Services Administration) have adopted the existing program as a requirement for their own buildings, making LEED certification part of the legal requirements for certain buildings in those jurisdictions.

In Seattle, Washington, for example, all municipal building projects must meet the LEED criteria, meaning that the building department must be able to process some highly innovative, high-performance designs, materials, equipment and systems. In Seattle and other cities like Portland, Oregon, features like waterless urinals, composting toilets, vegetated roofs, pervious pavement, building integrated photovoltaic panels, fuel cells, natural ventilation, passive heating and cooling strategies, and raised floor systems are becoming much more commonplace in new municipal buildings.

John Guenther, the building official for San Diego County, California, and I co-chair the USGBC Greening the Codes Committee. This committee is in the process of developing a survey for all LEED registered projects in order to gather information on code-related challenges and solutions. One goal is to use the resulting information to create a code-compliance guide for LEED projects. We also plan to develop code change proposals as needed, and hope to develop a cooperative relationship with ICC to jointly create training and educational resources for building departments.

As always, we invite the participation of code officials. Please e-mail Loretta Ishida at loretta@dcat.net if you are interested. If your jurisdiction would like to look into joining USGBC, I encourage you to visit their website at www.usgbc.org.

A professional member of ICBO, David Eisenberg co-authored The Straw Bale House and helped write the first load-bearing straw bale construction building code for Tucson and Pima County, Arizona. He can be contacted by phoning the Development Center for Appropriate Technology (DCAT) at (520) 624-6628 or via e-mail at david@dcat.net. For more information about DCAT, direct your browser to www.dcat.net.

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