

Does Sustainability Need a Paradigm Shift?



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The idea of sustainability seems to have taken root in just about every aspect of our modern-day life. Everywhere you look is some form of communication about a green attribute or a sustainability-related message. Even my children are discussing sustainability in school. The other day, as I was going to throw away some garbage, my little girl came up to me and said, "Dad, aren't you going to recycle that? We have to think about the future, you know." As you can imagine, I was very pleased to hear such a "holistic perspective" coming from my nine-year-old. The possibility that our children are being taught to view decisions and their consequences differently than we did while we were growing up is encouraging. Imagine that: A paradigm shift at age nine.

Nowhere else has sustainability been more prominent than in the construction industry. The idea of sustainability has affected the design and performance requirements for structures, as well as the products that go into them. Organizations like the United States Green Building Council (USGBC) have helped pave the way with guiding programs, such as their well-known LEED certification. The focus has mostly been on the construction process, including areas like location of a project, site impact, materials, indoor environmental quality, and energy performance. This is all a step in the right direction. However, are we overlooking something else?

In the United States alone, we have had quite a few devastating disaster "events." Some of these manifest from nature – hurricanes, tornados, floods, and fires –, while others, unfortunately, are caused directly by mankind, e.g., terrorist attacks. Of course, this is not just a challenge in the United States. These types of catastrophic events happen worldwide. The major earthquakes in Japan, Chile, and New Zealand alone have resulted in unimaginable loss. Each year in the United States, disaster-type events are responsible for billions of dollars in damage and countless loss of life. Another disturbing fact is that from the 1970s to now, the cost and amount of damage related to disasters has increased more than four times; however, the number of events has remained about the same. So why are structures becoming less resilient?

Further investigation shows that a variety of factors, such as code consolidation, changes in the project management process, economic pressures, and increased requirements on other building components (e.g., technology systems, fixtures, etc.) has placed an emphasis on decreasing overall construction costs by using less durable materials. These meet current code requirements, but we must keep in mind that building codes are a minimalistic approach, not an optimal approach. Is this approach sustainable? Is this approach really acceptable?

You may have already heard the phrase "functional resilience," which seems to be growing in popularity, but what does it mean? The idea is that if a structure were exposed to an event such as an earthquake, fire, hurricane, or tornado, the structure would first remain intact, protecting those who may be seeking shelter inside. Second, the structure may be restored to its full functional capacity with minimal efforts and resources. In other words, functional resilience is the development of disaster-resistant structures that protect life and do not need to be rebuilt after an event.

It seems logical that the idea of functional resilience would be given stronger consideration in our design and construction decisions. Today, all too often we seem to focus on the "now" and not on the "tomorrow." If we want to be truly sustainable, we should consider the impact of such events. It seems silly to go through extensive efforts to create a wonderful green building only to have it devastated by an event so that we can rebuild it again later. After all, any additional cost to build functionally resilient structures is definitely less than the cost to build the structure a second time. Maybe we should have a paradigm shift of our own and think about how our decisions today affect tomorrow. After all, isn't the future a big part of what sustainability is all about?

ASCENT On the cover: Penn State's Millennium Science Complex in Wyomissing, Pa. (see page 18)

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