

Building Disaster Prevention into the Cultural Fabric of the Developing World

by Stephen Forneris, AIA

On December 23, 2003, a 6.5 magnitude earthquake struck Paso Robles, California, resulting in the deaths of two people. Three days later and half a world away, a 6.6 magnitude earthquake struck Bam, Iran, killing 26,000 people. Again and again, similar events occur in different parts of the world with dramatically different results. Reflecting on this somber fact leads to the conclusion that we must find a way to share and transfer design and construction knowledge from one nation to another.

Exchanging this knowledge is not a move toward nation building or an attempt to micromanage another country's system of laws. It is a decent and moral human act. Just as we shared the polio vaccine and are now close to eradicating the virus, sharing our building technology will promote a safer environment in the future for everyone, regardless of where they live.

The development of a "building code culture" begins with education. This education must not only convey building code principles and parameters, but also provide an understanding of how a country that has successfully utilized the codes in mitigating disasters has maintained the viability of its building code culture. Once this complete system model is understood, professionals from different developing nations can begin to extract or modify portions of that model for their particular environment.

We speak in terms of "culture" because there is no single action or element that will achieve the goal of safeguarding a nation's valuable infrastructure and human life. A building code culture is a set of parallel activities that, when enacted in unison, save lives, increase productivity, and give a nation the ability to grow and develop with stability. A building code culture requires the following four parallel and interactive elements; when a nation first begins to introduce the culture, it is advisable to progressively follow the sequence given below.

- **Building Code.** This is a living document that is reviewed on a periodic basis in order to maintain reasonable and enforceable provisions appropriate to the unique local environment. As new products and techniques become available or the nature of the community changes, so should this document.
- **Building Products.** A building code will establish the minimum criteria for building products to assure quality in construction. These criteria may be as simple as restricting the use of sand from a certain region because it is known to contain



salts that will weaken construction. Once a product is specified in the code, it is vital that there be a method of surveying the marketplace in order to certify the product. In some nations, this is done by a national testing lab. In many others, competing private laboratories assure quality building products and transparency in testing.

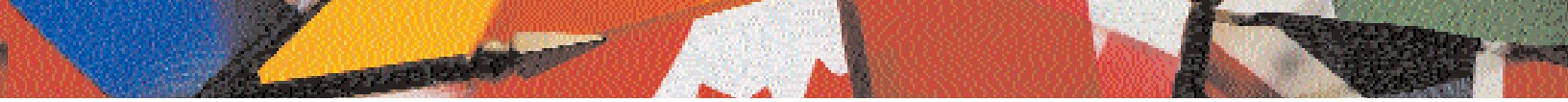
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- **Building Professionals.** With a building code and reliable products available, all of the individuals in the building process need to be educated about how to use the code. This is the most important aspect of any building code culture—without it, there is no system. Continual, quality education needs to be provided for architects, engineers, inspectors, contractors and general laborers.
- **Building Administration.** Once the building code, products and trained personnel are in place, a nation is ready to begin enforcing building safety provisions. A municipal-level authority is needed to administer the building code and help support the culture. The critical element of the administrative role is that it must be discharged with the understanding that excessive control will slow or stop growth.

The effectiveness of a controlling authority depends greatly on the quality of building professionals' educations. Educated and conscientious personnel are far more effective than a squad of inspectors who can get on and off a job site in the shortest possible period of time, and an abundance of such professionals can help steer an industry or establish new provisions as needed.

While most developing nations will correctly assert that they have and use building codes, it can be clearly demonstrated that many do not possess a building code culture as defined above. Upon closer examination, we will see that many employ only portions of two elements: a building code and a building administration. Unfortunately, even these are often not sufficiently developed.

I worked for ten years as a registered architect in the City of Guayaquil, Ecuador, which has a population of three million, using a building code some 30 years old. Further, the code was



poorly translated from English to Spanish and was comprised of excerpts from just 2 of the source's 36 chapters. While legally constructing dozens of projects during that time, I was never once visited by a building inspector from the city because there were none as we in the U.S. know them. The building department was so minimal that not one plan received a formal review of even the structural design. Obviously, a vigorous upgrade of the building code and the establishment of a rigorous inspection system were needed to improve building quality. However, the government's response was to pass a law exacting severe penalties, including prison terms, on anyone violating the existing building code. The greatest irony was that one could not actually obtain a new copy of the code book because the government had ceased publishing it!

A comprehensive program of building disaster prevention

must be woven into the cultural fabric of the developing world. It must be understood that safe, secure, high-quality buildings are not the result of a key individual or another page in the code book. They are the result of a systematic, cultural synergism of the four key elements outlined above: building codes, building products, building professionals and building administration. Failing that, we will only see more unnecessarily tragic disasters—except, I fear, much worse as the population of the developing world continues to grow. ♦

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