

SCHULTE & ASSOCIATES

Building Code Consultants
880D Forest Avenue
Evanston, IL 60202
fpeschulte@aol.com
847/866-7479

BUILDING CODE DEVELOPMENT PHILOSOPHY

By Richard Schulte

The fundamental question of what is the purpose of the fire safety and fire protection provisions contained in the International Building Code has been under discussion since the terrorist attacks which occurred on September 11th. Should the fire safety provisions included in the building code provide a “reasonable” level of safety for building occupants or should code provisions provide a level of safety which is greater than “reasonable”?

One perspective on this question is provided in the following statement by Rick Kabele, the executive director of the Alliance for Fire and Smoke Containment and Control (AFSCC), a trade group representing the manufacturers of passive fire protection products.

“I, for one, appreciate your common sense perspective. It seems so many others, like the sheep in the infamous tale, have lost their way. If not their sanity.”

The NIST report on the WTC event gave us all the guidance we should have heard. Buildings should be “hardened” against the ravages of fire, terrorism, and natural events, and methods of egress should be improved . . . not relaxed or weakened. The consequences of relaxing the building codes will likely not be felt or experienced by our generation, but by those that follow us. The current iteration of code amendments being developed propose little to “improve” our build stock, but offer much to “cheapen” construction costs on the back of fire and life safety in the built environment.”

In the statement above, Mr. Kabele expresses his opinion that a “reasonable” level of safety should no longer be the standard by which we judge code change proposals. Rather, the new standard for the acceptability of code change proposals is some undefined level of safety where buildings are “hardened” against actual and potential hazards, regardless of their probability of occurrence.

While the historical loss record can be utilized to determine whether or not a code change proposal is “reasonable”, this new standard for the purpose of the code can pretty much be utilized to justify any more restrictive requirement for inclusion in the code.

The historical record, fire safety statistics, show that the high rise office buildings have an excellent fire safety record. The statistics collected by the National Fire Protection Association (NFPA) indicate that the average annual number of fire fatalities which occur in U.S. high rise office buildings is less than one. (Not one per building, but a grand total of less than one for all of the high rise buildings in the United States.) By most objective standards, it would be concluded that the building code provisions which apply to high rise office buildings provide an adequate level of safety for the public, however, by the standard being proposed by the AFSCC (based upon the recommendations contained in the NIST World Trade Center towers investigation), there is still room for improvement in the level of safety provided for high rise office buildings.

In fact, Mr. Kabele questions the “*sanity*” of anyone who thinks that a “reasonable” level of safety is adequate in post-9/11 America.

Obviously, the cost of constructing buildings is impacted by fire safety and fire protection provisions contained in our building codes. With the fear generated by the events of September 11th now more than 10 years in our rear view mirrors, are we still concerned that terrorism is a major threat to America? Perhaps even a more poignant question in this discussion is, can America afford to build our building infrastructure to be resistant to terrorism and other improbable hazards?

At this point in time, the National Institute of Standards and Technology (NIST), has yet to provide any recommendations or guidance as to how to design our buildings to be terrorist-proof, or even terrorist-resistant. The reason why NIST has not provided recommendations for terrorist-proofing our buildings is that it is simply not possible to do so and it is certainly not economically feasible to do so. The potential for terrorism is a risk that Americans must simply deal with in other ways and accept as part of living in a modern world.

With respect to hazards other than terrorism, it would seem that the magnitude of low probability events is simply too difficult to predict to be able to rationally design for these events. Hence, the cost of designing for these events becomes prohibitive when compared to the benefit.

A good example of this is the design of the levees which protect the City of New Orleans from flooding. In the 1960's, Congress authorized payment for the construction of levees which were designed to protect the city from a Category III hurricane. Of course, there is a probability that a hurricane of greater ferocity could strike the city, but the construction of levees capable of withstanding such an event was simply not economically feasible. In August 2005, Hurricane Katrina struck to the east of New Orleans and the levees protecting the city failed, not because the levees were overwhelmed by storm surge, but because of a combination of a lack of maintenance and engineering design flaws which were not apparent when the levees were constructed. In other words, the tax dollars expended to construct the flood protection for New Orleans were essentially wasted on protection which didn't perform its intended function.

The flooding of New Orleans in late August and early September 2005 provides us with a lesson. We have the engineering technology to build structures which are capable of resisting and preventing catastrophes which are common occurrences (*e.g.*, river floods), but our capabilities to protect our citizens and buildings from hazards which are infrequent is simply not reliable and not feasible from an economic standpoint. In the case of New Orleans, capital was expended to construct the levees which eventually failed and then additional capital was expended to reconstruct the city after the failure of the system.

In conclusion, it would seem, based upon the lessons which we learned from the saga of New Orleans and Hurricane Katrina, that “reasonable” measures work reasonably well and that extraordinary or complex safety measures are not necessarily reliable when improbable events do occur. Given this, the expenditure of additional capital beyond that which is required to provide “reasonable” protection for building occupants is actually a waste of capital and that this capital can be better utilized to address other safety issues.

A “reasonable” level of safety for building occupants should remain the test for whether or not a revision of code provisions is warranted.

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Richard C. Schulte