



Who Hijacked My Building Code?

By David Pierson, S.E., SECB

I believe that the majority of Americans understand the need for some kind of building code to regulate construction. Millennia ago, Hammurabi gave us the “eye-for-an-eye” version of the building code. Since the Chicago fire of 1871 and the San Francisco earthquake of 1906, there have been building codes in America.

The original purpose of our building codes was to protect the occupants of a building from disasters such as fires and earthquakes. Other natural events, such as high winds or snow, are also considered. Provisions are directed at various elements of a building that affect life safety for the public; most prevalent are the fire safety and structural systems. Other life safety issues concern indoor plumbing, electricity, and mechanical systems.

I know of no rational argument against governmentally imposed regulations for items that significantly affect life safety. However, there are obviously some inherent risk factors that must be considered in light of the overall cost to society and the benefits to the building owners/users. Some good ideas might save lives, but at what cost? Risks need to be evaluated, and costs must be measured. As a society, we don't have enough resources to completely eliminate risk from life. If the building code mandated that every home be built adequately to survive after a bomb is dropped on it, few people would have a home to live in.

Thus, the term “life safety” must be used in context of reasonable risk vs. cost to society. Obviously, everyone wants the lives of firemen and rescue workers to be protected. But we also innately realize that those professions carry some risk. So, how much cost should be borne by society (because every dollar spent by an “owner” is, in reality, spent by “society”) in order to reduce the risks further? At what point are the risks adequately low?

Structural engineers, by our very nature, perceive the consequences of building failures as being very high. However, in our training, there is very little focus on understanding risks from a societal perspective.

Hence, we may view the risks we deal with as being the most important risks for society to address. Without a mechanism to weigh the costs, anything that reduces risk can be added to the building code and justified by the suggestion that it might save lives. For instance, the 1997 UBC was, in my opinion, a code that adequately protected lives. So, why has the building code changed, six times, since 1997?

I understand that we are continually learning and, with our advances in knowledge and technology, there will inevitably be new ideas and new ways of looking at design. But, are they really better? Who gets to decide if they are better, and what criteria do they use?

For instance, who decided that we should map wind speeds at a strength level rather than at service level? Since the 1994 UBC, I have learned four new ways to find the design wind pressures on buildings. Yet, recently, while researching the construction drawings of a building built in Florida in 1962, I found this note:

“Wind Design Pressure = 20 psf”.

I have to believe that this building has been exposed to very high winds in its 50 year life, and yet there it stands, occupied and undamaged, and nobody is calling it a dangerous building.

Revisions to building codes should be made slowly, except in dramatic discoveries such as the Northridge steel moment frame issue. As an example of having moved too quickly, consider the maps of seismic coefficients found in ASCE 7 and the IBC. I call these the “yo-yo” maps of the building code. In some places, the design seismic ground motions have gone up and down by 20% or more through the last several editions of the code. Buildings built in 1998 may have been okay per the 1997 UBC, then significantly under-designed per the 2006 IBC, then again just fine under the 2012 IBC. Let's be honest and admit that we really don't know seismic demands well enough to justify changes in the capacity

equations when the capacities change by only 5% or 10%.

Beyond the provisions concerning life-safety, other things are creeping into the building code that go well beyond the purpose of a building code. Consider the energy code. This is simply an exercise in social engineering and has no place in a building code. Those defending the energy code claim that it will save the owners money. However, that is not the purpose of a building code. That is what a free-market economy is for. If the laws of supply and demand are allowed to freely operate, energy will be conserved, and people who so desire will save money and use less energy, without taking more freedom of choice from American citizens.

Many other provisions, both structural and non-structural, have found their way into the building code, and have nothing to do with life safety. Consider Section 1204.1 of the IBC:

“Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining a minimum indoor temperature of 68°F at a point 3 feet above the floor on a design heating day”.

What a great thing! I would love my home to have that – and the free market society I live in allows me to choose to have that. But this should not be in the building code. Instead, it should be in a book called “Great Ideas for Architects, Engineers, and Builders to Offer to Clients Who Want Nice Comfortable Buildings.” And that is just one example of many things in the current IBC that should be similarly considered.

Our building code has been hijacked. Is anyone willing to offer a ransom? ■

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