Codes vs. Standards

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In my previous articles I've discussed building codes and standards without explaining the difference between the two. For me, the difference is very obvious and I tend to treat the subject as if everyone else is aware of the difference, too. Instead of asking, most people will nod their heads in agreement even if they don't really understand. I do the same thing when conversing with military fighter pilots (I hear that if you tie their hands together they can't talk). But I digress. The bottom line is this: there are differences between codes and standards, and those who work with either, or both, should know the difference.

What's a Standard?

In doing my research for this article, I typed "What is a standard?" in my favorite internet search engine, which in return gave me 5,270 web pages that listed everything from "What is a standard drink?" to "What is a standard size mouse pad?" Standards affect just about everything we use in our lives: food, clothing, cars, telephones, computers, etc. Standards set the benchmark to which everything else is measured, thereby removing trade barriers and promoting competition. Standards provide confidence, reliability, and compatibility in the marketplace.

To start, *Webster's New World Dictionary* defines a "standard" as "something established for use as a rule or basis of comparison in measuring, judging capacity, quantity, content, context, extent, value, quality, etc." In the construction industry, standards typically address quality of materials (through testing methods or minimum prescriptive requirements), installation methods, classification, and design criteria. Standards are narrow in scope, and usually focus on a particular product or system. For example, NFPA 13 addresses the design and installation of fire sprinkler systems.

To illustrate the importance and far reaching scope of standards, let's assume for a moment there were no standards. One day you purchase a really nice shade lamp that caught your eye at the home store. You take it home, unpack it, and set it up in a particularly dark corner of your study. Next, you take a typical light bulb out of the cupboard and in your attempt to screw it into the lamp you discover that the socket is half the size of the light bulb! Irritated, you read the owner's manual and find out you have to use their special bulbs. So, you go out and buy the correct light bulb (which cost you a bundle, by the way). You insert the new light bulb into the socket, and, with a sigh of relief, you reach down to plug the lamp into the outlet. But, wait! The plug has three square prongs and the outlet is made for only two round ones. At this point you scream in anger "Why can't anybody standardize these things!" Well, fortunately for all of us, they have.

The history of standards can be established as far back as the ancient civilizations of Egypt and Babylon, almost 7000 years ago. Relics found have pointed to a system of standards for trade and commerce that regulated weights and measures. One of the biggest impacts of standardization was on the railroad. Before the Civil War, there were as many as 20 different railroad gauges, requiring the changing of wheels where tracks of different gauges met. Since railroads were of great military importance during the war, an attempt to standardize was initiated, and the 4 foot 8-1/2 inch gauge, which accounted for more than 50 percent of the railroads, became the national standard by 1886.

In the United States, there are two types of standards: mandatory and voluntary. Mandatory standards are those that all manufacturers must comply with, and are typically set by the government. A good example would be U.S. safety standards regarding automobile seatbelts or side-impact resistance.

Voluntary standards, on the other hand, are not regulated by the government, nor are they required to be used by the industry. Voluntary standards are considered consensus standards since they're developed using a process that allows participation by all interested stakeholders including representatives of producers, manufacturers, users, consumers, and government agencies. Voluntary standards in the United States include those developed by the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), the National Institute of Standards and Technology (NIST), and over 400 other organizations. The U.S. Government in the past has been a major participant in the development of voluntary standards. However, since the "National Technology Transfer and Advancement Act of 1995," the Government has made a move to reduce its own standards development activities, and rely more on the private sector.

The difference between mandatory and voluntary standards can become a little blurred at times. Voluntary standards are commonly included by reference in model building codes and other regulations, thereby giving them the force of a mandatory standard. But the fact that these codes and regulations incorporate voluntary standards is a testament to their reliability and importance in the world today. Speaking of codes….

What's a Code?

Returning to *Webster,* a "code" is defined as "a body of laws, as of a nation, city, etc." In other words, compliance with the code is required since it's the law. To take this further, a "building code" would be the law as it applies to buildings. Probably the earliest known building code was found in the Code of Hammurabi (1795-1750 BC), ruler of Babylon. Laws 229 through 233 specifically address the construction of a house and the consequences of failure:

229. If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.

230. If it kill the son of the owner the son of that builder shall be put to death.

231. If it kill a slave of the owner, then he shall pay slave for slave to the owner of the house.

232. If it ruin goods, he shall make compensation for all that has been ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means.

233. If a builder build a house for some one, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means.

It's obvious that the Code of Hammurabi is a performance-based code (the house should not fall down), which is a direction that some code developing organizations are taking. But for the most part, model codes are prescriptive in structure. Fortunately, model codes have come a long way since the time of Hammurabi. The first such model building code was developed in 1905 by the Fire Underwriters Association, and was titled the "National Building Code." This code focused on protecting the building rather than the occupants from fire. Model codes that focused more on life safety and fire protection weren't developed until the 1930's. Codes are typically written in what is called mandatory or "code" language. This is very similar to specification language, with which most of us are quite familiar. This is

best exemplified by using the word "shall" in lieu of "may." Using a mandatory language makes the code enforceable; however, enforceability is somewhat subjective and could lead to a variety of interpretations. But laws are like that, which is why we have judges.

Model codes, such as the *International Building Code, International Residential Code, National Electric Code,* and the *Uniform Plumbing Code*, are not law until they are legally adopted. Jurisdictions adopt model codes through an ordinance, typically on a vote by the city council or similar governing body. It is not unusual for jurisdictions that adopt model codes to amend them. Local amendments are applied to adopted codes to make them more usable for the local area, to comply with other ordinances, or to address specific concerns of the local jurisdiction. Some jurisdictions have their adopted codes and amendments published together in a single code book (the states of California and Florida, for example), while most other jurisdictions print a separate document which is purchased or distributed separately.

Codes are revised on a regular basis, typically every three years. This period of revision is commonly referred to as the code development cycle. Each model code organization establishes methods and procedures for revising their model codes, with most codes, if not all, using a process that is open to public participation. In a separate article, I'll explain how codes are revised and how you can participate in the process.

Code development can be a tremendous effort; just ask anyone who was involved with the Phoenix Construction Code when the city had its own building code. Adopting a model building code takes the added effort out of managing and maintaining the code development process internally. Plus, model codes bring national, and sometimes international, expertise to their development. Even the City of New York, who has had a "home-grown" building code since 1938, is reviewing *the International Building Code* and the *NFPA 5000* for potential adoption.

Codes and standards play an important role in today's construction industry. As for building codes, we have no choice but to comply with those adopted by the jurisdictions in which we design and build. And as for standards, we comply with those referenced by the adopted building codes, as well as those specified in the construction documents. Although codes and standards are different, you can't have one without the other in the building construction industry.

To comment on this article, suggest other topics, or submit a question regarding codes, contact the author at ron@specsandcodes.com.

About the Author: Ronald L. Geren, AIA, CSI, CCS, CCCA, SCIP, is an ICC Certified Building Plans Examiner, and is the principal of RLGA Technical Services located in Scottsdale, Arizona, which provides specifications and code consulting services to architects, engineers, owners, and product manufacturers. A 1984 graduate of the University of Arizona, Ron has over 23 years of experience with military, public, and private agencies.