

SECTION V

Codes and standards

Codes and standards are quite different types of documents in their composition and purpose. In their content, however, they address similar topics, and oftentimes are based upon each other. Building codes, where they are of the totally prescriptive type, can have more effect upon environmental systems design and the energy consumed by the systems than any design concepts or systems selection of the designer. It is for this reason that the author is apologetic for not including more material on the subject of codes and standards. Philosophically, however, in justification for the lack of more subject matter addressing this extremely important topic, codes and standards are always based upon current state of the art at the time they are written. The first step, then, in the revision or updating of the code or standard is to advance the state of the art and that goal is the fundamental purpose of most of the chapters in this book.

Unfortunately, particularly with building codes, the very existence of the code tends to fix the state of the art and prevent or hamper progress because it is based upon yesterday's technological level. The cycle of change is several years, thus the industry moves as if on a stairway rather than on a continuous line upward.

Consider the differences between a standard and a code. The second chapter in this section dwells on various types of standards and their value to society as well as their technical-economic structure. Simply stated, a standard is a method, technique, or other expression of the state of the art which all *knowledgeable* practitioners agree is the most accurate expression or statement thereof. For example, if for the benefit of the consuming public, it is desired to establish a standard method for testing room air conditioning units, the method decided upon is agreed to by all of the persons who manufacture the units and that method becomes the "standard" method. If there is serious disagreement between the "experts" (those who design and manufacture the units), no consensus is achieved and no standard is adopted. Thus, in the entire area of consensus standards, it is germane to recognize that a standard method or state of the art exists *only* if there is consensus among the *experts*.

Once consensus is achieved, the standard becomes a public document against which all technical aspects relating to the topic of the standard are compared. Continuing the example, if there is a standard on the method of testing and rating room air conditioners, all reputable manufacturers will use the method and so stipulate in their technical or sales literature. As a secondary step, private testing laboratories or agencies are often used to serve as watchdogs to "certify" that the testing and rating was done properly in accordance with the standard. All licensed professional designers recognize the value of the standards, and virtually none would accept a component or subsystem that did not comply to the nationally recognized and accepted standards.

It must be recognized that in some areas, "meeting the standard" may not imply the

“best,” since the standard may have had to be reduced to some level of mediocrity in order to achieve the consensus.

Codes are a bit different than standards, particularly in the realm of building codes. Codes are not necessarily authored by technical experts, they need not achieve a consensus prior to finalization, and they are legally mandatory as statutes or ordinances. Additionally, there exists a large army of enforcement officials to ensure that the designers and constructors of buildings comply with the letter and, in some cases, the intent of the building codes.

Building codes have proved time and again to be a necessary part of the responsibility of local and/or state governments. Oftentimes where they do not exist (as in many rural areas of the United States), unsafe, unsanitary, or unhealthy building environments have been found to exist. Unfortunately, since the authoring and adoption of codes is not in the hands of knowledgeable professionals, these codes have often been manipulated in their basic content by special interest groups. This practice of manipulation, and opportunity has fortunately been reduced in recent years with the advent of the so-called universal, basic, or uniform building codes.

Another unfortunate aspect of building codes has been their tendency to fix the state of the art by statute to where it is (or was) at the time the code is adopted. Since statutes cannot be adopted that simply legislate, say, a code including future updating, it is possible that a national-type code document can be updated annually; but in a given community, if the local governing body does not act on a change to the legislation, the old version remains in effect.

As the energy revolution started becoming evident in the early to mid-1970s, many people recognized that the most evident vehicle to legislate energy-effective building design was through the building codes. The fundamental problem was that building codes, although they were used in virtually all major population centers, were locally written and controlled, and thus not suitable to influence by the central or federal government.

The major thread which the federal government has been able to grasp in this diffuse legislative situation is a national consensus standard adopted by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), entitled “Energy Conservation in New Building Design—ASHRAE Standard 90.” Many so-called “model” code groups have essentially rewritten the text of this standard in code language and thus provided an energy conservation section in their codes. The challenge still remains for the federal government to convince the various state and local governments to update their building codes. The first chapter in this section addresses this issue. Also, Chapter 20 includes a discussion on the resource energy section of ASHRAE Standard 90.