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Building code compliance: managing the risks

To many architects and engineers (A/E's), the words "building code" have a distinctly negative connotation. This is not entirely surprising—the words often come up in the context of an obscure requirement that no one understands. Or even worse, two obscure requirements that appear to contradict each other. Being able to design to the applicable building code is a non-negotiable element of an A/E's work. Even if a contract does not require compliance with applicable codes, courts will generally find that failure to comply with the building code is negligence.

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In agreeing to comply with applicable codes, however, the A/E should be careful to understand exactly what they are agreeing to. In addition, if there are aspects of the design that the A/E is not familiar with, or the project is in a jurisdiction in which the A/E does not typically work, the A/E might want to consider using a code consultant.

Model codes

Building codes and standards are the rules and guidelines that specify the minimum acceptable level of safety for buildings and other structures. The primary objective of building codes and standards is to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and other structures.

Rather than developing an entire building code, states generally base their codes on a model code developed by a standards organization. For most of the 20th century, there were three commonly-used model codes in the U.S.: the Uniform Building Code (UBC), the Building Officials Code Administrators National Building Code (BOCA/NBC) and the Standard Building Code (SBC). The UBC was primarily used in the midwestern and western states, the BOCA/NBC was used in the northeastern states and the SBC was used in the South. The organizations that published these codes merged in 1994 to form the International Code Council (ICC) and in 2000 discontinued publication of all three codes. In their place, the ICC publishes the International Building Code (IBC) which, with only a few exceptions, has now replaced the prior model codes as the basis for all state and local building codes.

The international code family

Although references to the "building code" usually refer to the IBC, the ICC currently publishes 15 "I-Codes." They are as follows:

- International Building Code (IBC)
- International Energy Conservation Code (IECC)
- International Existing Building Code (IEBC)
- International Fire Code (IFC)
- International Fuel Gas Code (IFGC)
- International Green Construction Code (IGCC)
- International Mechanical Code (IMC)
- ICC Performance Code (IPC)
- International Plumbing Code (IPC)
- International Private Sewage Disposal Code (IPSDC)
- International Property Maintenance Code (IPMC)
- International Residential Code (IRC)
- International Swimming Pool and Spa Code (ISPSC)
- International Wildland Urban Interface Code (IWUIC)
- International Zoning Code (IZC)

As of October 2015, the International Building Code was in use or adopted in all 50 states and the District of Columbia (D.C.). The International Residential Code was in use or adopted in 49 states (all but Wisconsin) and D.C. The International Energy Conservation Code was in use or adopted in 48 states (all but California and Indiana) and D.C. The International Mechanical Code was in use or adopted in 46 states (all but California, Hawaii, Maine and Vermont) and D.C. The International Fuel Gas Code was in use or adopted in 43 states and D.C. The International Fire Code was in use or adopted in 42 states and D.C. The International Plumbing Code was in use or adopted in 35 states and D.C.

The remaining codes have been adopted in fewer states and are often only adopted at the local level. The most recent code, the International Green Construction Code, was first released in 2012 and as of October 2015 had been adopted at the local level in Arizona, Colorado, Idaho, New Hampshire and Washington State, and statewide in Florida, Maryland, North Carolina, Oregon and Rhode Island, as well as in D.C. The I-Codes have also been adopted in Guam, the Northern Marianas Islands, the U.S. Virgin Islands, Puerto Rico and Bermuda.

A listing of which states and territories have adopted which codes can be found at: http://www.iccsafe.org/wp-content/uploads/stateadoptions.pdf

(Despite the fact they are referred to as "International" codes, they have not been widely adopted by other countries.) A listing of which codes have been adopted by local (city or county) governments can be found at: http://www.iccsafe.org/Documents/jurisdictionadoptions.pdf

Although the IBC has now replaced its three legacy codes (the BOCA/NBC, which was published by the Building Officials Code Administrators International; the UBC, which was published by the International Conference of Building Officials; and the SBC, which was published by the Southern Building Code Congress International), there are still a number of model codes other than the I-Codes in use.

All but three states have adopted the National Electric Code (NEC) published by the National Fire Protection Agency (NFPA) statewide as the basis for their electrical code requirements. In these three states (Arizona, Missouri and Mississippi), the NEC is typically adopted at the local level. Up until the 2006 code cycle, the ICC also published the International Electrical Code (IEC), which was referenced in section 2701 of the IBC. However, the IEC was just an administrative provision that referenced the NEC. Since 2009, section 2701 of the IBC has referenced the NEC (NFPA 70) directly. As of October 2015, the current edition of the NEC is the 2014 edition. However, several states are using the 2011 edition and a few states are using the 2008 edition.

The NFPA 1 Code is used in several states in lieu of the IFC. Although the codes are quite similar, NFPA 1 provides a more comprehensive approach to fire safety and includes a definitive breakdown of specific safety measures for operations and processes within specific types of occupancies and for various building services.

Other currently used model codes include the Uniform Plumbing Code (UPC) and Uniform Mechanical Code (UMC), both published by The International Association of Plumbing and Mechanical Officials. About a dozen states have either adopted the UPC or developed their own plumbing codes based on the UPC.

“A model code does not become the law in any jurisdiction (state, county or city) until it is adopted by a vote of the designated adopting authority.”

State versus local codes adoption

As a general rule, model codes are adopted under one of three schemes:

- Codes are adopted at the state level, with or without amendments. Local modifications and amendments are not allowed.
- Codes are adopted at the state level, with or without amendments, but local amendments and modifications are allowed to some or all of the codes. Usually, these amendments and modifications can make the code requirements more stringent but not less stringent.
- Codes are adopted at the local (city or county) level.

About two-thirds of the states adopt their building codes at the state level. These states typically have an agency that is charged with administering the building codes. The agency will promulgate a set of regulations to carry out this responsibility. Generally, the first regulation will be that the agency is adopting a specific edition of a model code. The other regulations will be changes to various sections or subsections of that code. The other one-third of the states adopts their building codes at the local (city or county) level. Generally, the codes are adopted through a vote of the city council or county commissioners after a staff review.

In the early 1900s, before model codes were widely available, it was common for cities to develop their own codes. Many of these codes were written by insurance companies who were motivated by reducing the risk of fire to buildings they had insured. Over time, most cities have migrated to model codes and Chicago is the only major city that still uses its own code. In some states, codes are adopted state-wide for certain types of facilities, such as healthcare facilities or schools, but are adopted locally for all other types of facilities.

Adoption of a model code

A model code does not become the law in any jurisdiction (state, county or city) until it is adopted by a vote of the designated adopting authority. When a jurisdiction adopts a model building code, it adopts a specific edition of the model code, for example, the 2009 International Building Code. When adopting the model code, the jurisdiction can add, delete, or modify sections to address concerns specific to the jurisdiction.

The IBC is updated on a three-year schedule; the most recent release is the 2012 edition. Although a jurisdiction can choose to continue using an older version of a model code, most jurisdictions update their codes regularly to avoid having to deal with A/Es seeking variances based on what is allowed by the newer edition of the model code. Nevertheless, there is always a lag between the release of a new edition of a model code and when a jurisdiction adopts it. The adopting authority must review the changes in the new edition, evaluate the effect on any amendments it has enacted and ensure that its code inspectors are aware of the changes.

The ICC website

All of the I-Codes published between 2000 and 2012, including the recently-released International Green Building Code, can be viewed online for free at www.iccsafe.org. To see all of the codes, search for “ICC free resources” and select the International Codes option. To see a particular code, search for that code, for example “ICC IBC 2009” and select the link for publicecodes.

For the 2009 IBC, this would be: http://publicecodes.cyberregs.com/icod/IC-P-2009-000019.htm.

While the codes can be viewed for free, a paid subscription is required to either print or save any code or section of a code.

The ICC website also contains information about which codes have been adopted by which states. There is a webpage for each state that shows the codes adopted by that state; the webpage also contains contact information and links for relevant state agencies. For example http://www.iccsafe.org/about-icc/government-relations/map/massachusetts/ is the web page for Massachusetts.

The ICC website is not always up to date, but it does provide a starting point for researching applicable codes. The document download found at http://www.iccsafe.org/gr/Documents/AdoptionToolkit/HowStatesAdopt_I-Codes.pdf explains the code adoption process in each state.

Standard of care for code compliance

In the U.S., building codes fall within each state's general "police power" to protect the health, safety and welfare of its communities. This means that each state can determine the design requirements for structures built within that state.

Unless the A/E's contract requires a particular standard of care for compliance with codes, the standard applicable to the rest of the contract would apply to code compliance. If the contract does not set a standard of care, the state's common lawi standard of care would apply. Most states use a so-called local standard of care for design professionals. This is often stated in words similar to those used in American Institute of Architects B101:

> § 2.2 The Architect shall perform its services consistent with the professional skill and care ordinarily provided by architects practicing in the same or similar locality under the same or similar circumstances.

A few states use a national standard of care, typically stated as:

> Design professionals have a duty to exercise the ordinary skill and competence of members of their profession.

Despite the difference in wording, a court's interpretation of these two requirements is likely to be very similar. Both standards are interpreted to mean that while an A/E is not required to guarantee perfection, he or she is expected to perform competently.

When a contract simply restates the common law standard of care, failure to conform to the stated standard of care would be negligence (professional malpractice) and could result in a negligence-based breach of contract. This distinction between an ordinary breach of contract versus a negligent act, error or omission can be significant. In many states, the statute of limitations for filing a negligence (tort) claim is shorter than the statute of limitations for filing a breach of contract claim. If the theory for a breach of contract claim is based on negligence, the tort statute of limitations may be applied to limit the time in which the claim can be filed against the design firm.

In order to prove a negligence claim against a design professional, it is generally necessary to have an expert witness testify to the standard of care and the fact that the design professional's conduct fell below the standard of care.

In addition, several states require a plaintiff filing a professional negligence claim against a design professional to obtain a Certificate of Merit from a design professional within the same field. The Certificate of Merit (referred to as Affidavit of Merit in some states) must state that the plaintiff's claim has merit. Finally, and perhaps most important for an A/E, a negligence claim may be covered by Professional Liability Insurance; whereas a breach of contract claim may not be covered.

Contracts for complex or novel projects may establish a more specialized standard of care. For example, the contract for the design of an art museum may require that the A/E's services comply with the "standard of care of other design professionals with experience in designing art museums in major cities." Such provisions are usually insurable, as they simply require the A/E to have a particular set of skills and exercise the standard of care appropriate to the project type. Likewise, a court may find that an A/E that has represented himself or herself as having expertise in a particular type of design (e.g., medical facilities or sustainable design) is required to comply to a standard of care corresponding to those representations, rather than the common law standard for a generic building type. Provided the A/E does not warrant that the design will achieve a certain rating or qualification, the specialized standard of care will generally be insurable.

However, an A/E should never agree to a contract that requires the design to be without defects. Similarly, an A/E should be wary of contracts that require services of the "highest" or "best" quality. Failure to comply with the client's understanding of the best quality could lead to an uninsurable breach of contract claim. An A/E should also be cautious about agreeing to "strict compliance with all applicable codes, laws, regulations and standards." While the requirement seems reasonable, on all but the simplest projects there are likely to be hundreds of applicable codes and standards. Often provisions will be susceptible to different interpretations and in some cases the provisions of one code will conflict with those of another.

Absolute language such as "strict compliance" and "all codes" puts the A/E in a situation where, no matter how reasonable the A/E's services may be; its client can prove breach of contract based on noncompliance with a specific, but perhaps meaningless, provision in a code, standard, rule or regulation. Likewise, the A/E could be in breach of contract for not complying with all codes, despite the fact that compliance was impossible.

Compliance with codes and regulations should, if possible, be tied to the professional standard of care, using wording such as, "The A/E shall use the professional standard of care to comply with applicable codes," or, "The A/E shall exercise professional care and judgment to design in compliance with requirements imposed by governmental authorities having jurisdiction over the project."

Code compliance consultants

A/E's engaged in innovative projects with nontraditional elements or building materials often find that their designs raise issues that are not explicitly addressed by the codes. Designs for medical and laboratory facilities; stadiums, arenas, convention centers, and other large assembly areas; airports; large schools; assisted-living complexes; and warehouse facilities often involve complex code issues. These types of building may also involve regulatory compliance issues generated by special concerns such as proper ventilation, smoke control and storage of hazardous materials or accessibility. Unless an A/E has considerable expertise in the design of such facilities and experience in the jurisdiction where the facility will be built, the A/E might want to consider encouraging the owner to engage a code consultant.

Code compliance consulting services emerged in the 1970s with the trend toward design of nontraditional structures such as atriums that were not specifically addressed in the building codes. As codes and standards have become more complex, the demand for experts in code compliance has expanded. It is not possible to do an in-depth review of when and how to use code compliance consultants in this article. What can be said is that the use of a code consultant to augment the A/E's in-house knowledge and skills can be a very valuable risk-management resource.

The larger and more complex a project, the greater the need may become to retain one or more code consultants to assist the designer in identifying and designing to the codes and requirements that are applicable to the project.

As many of the building code requirements relate directly or indirectly to fire and egress safety, the code compliance services field has traditionally been dominated by Fire Protection Engineers. However, many firms that began by offering fire code consulting have expanded to include consulting on building codes and accessibility compliance, indoor air quality consulting, egress studies, energy analysis, materials research, preliminary project programming for code compliance and assistance with zoning. Thus, code consultants may also be architects or structural, mechanical or electrical engineers with an in-depth knowledge of both the code requirements for their work and the code review and approval process.

The range of services provided by Fire and Life Safety code consultants includes:

- Analysis of code requirements
- Resolution of conflicts between different codes
- Documentation of code compliance
- Equivalency formulation
- Analysis of means of egress
- Analysis of hazardous materials
- Fire and egress modeling
- Site investigations and surveys
- Smoke management system analysis/testing
- Accessibility consultation
- Preparation of The Joint Commission (TJC) Statement of Conditions (SOC)

Code consultants can recommend effective solutions to problems that might otherwise require design changes, increase construction costs or delay building occupancy. Benefits to using code consultants can include:

- Reduction in potentially costly redesigns
- Improvement in scheduling efficiency
- Reduction in delays in building occupancy
- Improvement in fire protection services tailored to the project
- Easy-to-understand presentations of life safety concepts
- Time savings by efficient research analysis and gaining early approvals
- Cost savings through innovative equivalencies

Code consulting: healthcare facilities

Healthcare facilities tend to be specialized environments with extremely complex, ever-changing functions. Code consultants with expertise in such facilities can often provide valuable assistance in ensuring compliance with requirements of The Joint Commission (TJC) and the Centers for Medicare & Medicaid Services (CMS). TJC is an independent, not-for-profit organization that accredits and certifies healthcare organizations and programs in the United States. TJC requires healthcare facilities to document that a fire-safe environment is maintained and demonstrate compliance with the intent of the Life Safety Code (NFPA 101). The TJC Statement of Conditions (SOC) helps organizations document conditions and develops plans to correct deficiencies. The Plan for Improvement (PFI) portion of the SOC allows an organization to manage any deficiencies that it discovers, bring its buildings into compliance through designated activities, set completion dates and track progress.

The code consultant will perform a survey that documents building occupancies, as well as fire protection features such as sprinklers, fire alarm systems, smoke control systems and fire-rated wall plans. The survey will show the location of items that comply with the SOC requirements, along with deficiencies, including any necessary corrective actions. Code consultants can also prepare the validations surveys required by CMS.

Code consultants may also provide specialized design services such as Fire Sprinkler Design, Sustainable Fire Sprinkler Design, Fire Sprinkler Corrosion Assessment, Fire Alarm Design, Mass Notification Design and Low Voltage Design. Code consultants often maintain libraries of contemporary and historical construction codes, allowing them to research the exact requirements for a building at the time of construction, currently, and at any time in between. Their knowledge of the code allows them to not only determine the literal meaning of a code provision, but to know the history and intent of the provision.

Many code consultants also provide litigation support as their knowledge of the codes and experience in applying the codes allow them to be valuable expert witnesses. Their services can include:

- Analysis of building and fire code compliance
- Interpretations of building and fire code provisions to determine the intent of a requirement
- Evaluation of fire alarm and automatic sprinkler system designs to determine compliance with applicable codes and standards
- Analysis of value pricing for fire protection system designs
- Analysis of the effects of a fire and the response of fire protection devices through computerized modeling and event reconstruction
- Assessment of products and equipment through testing of performance in simulated environments
- ADA review and analysis for deficiencies and Department of Justice complaints

Code compliance review

Code compliance review, whether done by in-house personnel or a code compliance consultant, should begin early in a project so that any conflicts between applicable codes can be resolved before they become too difficult or expensive to correct. The review should include structural, electrical, HVAC, fire, seismic and ADA consultants as applicable. Often the review begins during the schematic design phase. The schematic design is analyzed and a preliminary report that includes a code summary and potential code-related design issues is prepared. The code summary should contain basic information such as applicable codes, occupancies, egress requirements and materials requirements. Some jurisdictions have a code compliance checklist that must be submitted with the permit drawings. In other jurisdictions, A/E's will often develop their own checklists to track code compliance information.

Building code officials do not have a duty to find errors in the plans

More than one A/E has been in the uncomfortable position of having a building that he or she designed fail an inspection due to a code-related design defect. While the plans might have been reviewed for compliance with the code and various errors noted, the plan checker will likely not find every error in every drawing.

From a practical standpoint, this would not be possible. Within the amount of time allotted to check a set of plans, there is no way a plan checker can flip back and forth between dozens of drawings and make sure everything is coordinated. In most cases, there would be no point. Usually, at the time plans are submitted for permits, certain design decisions have not been made and dimensions may be intentionally left off or approximated.

Code consulting: hazardous materials

The storage, dispensing and use of hazardous materials—those which present either physical or health hazards—is highly regulated by building codes, fire prevention codes and NFPA standards, as well as by insurance underwriters. As non-compliance issues can be both dangerous and expensive to mitigate, design for hazardous materials requires thorough knowledge of applicable regulations. Thorough knowledge of the applicable regulations and the ability to prove compliance to the Authority Having Jurisdiction (AHJ) can also prevent costly "over-design."

Code consultant services can include:

- Hazardous materials classification
- Building and fire code analysis and conflict resolution
- Site investigation and analysis
- Equivalency concept formulation, analysis and presentation
- Hazardous Materials Inventory Statement (HMIS) and Hazardous Materials Management Plan (HMMP) preparation
- NFPA 30 flammable liquid decision tree analysis
- Development of fire detection and suppression system design criteria / design document preparation

Furthermore, from a legal standpoint, the courts in many states would hold that the plan checker does not owe the A/E any legal duty to find errors in the plans. The reason that plans are checked for compliance with the building code is the same reason that building codes are adopted—to ensure the safety and protection of the public at large. Because the duty to find errors in the plans is owed to the general public rather than any particular individual, many states would find the A/E has no basis for a claim. This holding—that a private individual cannot bring a negligence claim when the duty that was breached is owed to the general public—is known as the public duty doctrine.

Even those states that do not follow the public duty doctrine, do not charge a plan checker with the responsibility of finding all of the errors in a set of drawings. As the Minnesota Supreme Court stated in *Hoffert v. Owatonna Inn Towne Motel, Inc.,* 293 Minn. 220 (1972), building codes, permits and inspections are designed to protect the public and are not meant to be an insurance policy by which the city guarantees that every building is built in compliance with the building and zoning codes. The court further noted that the fee charged for building permits was to offset the expenses incurred by the city in promoting the public interest; it was not an insurance premium that made the city liable for defective construction.

If a design is non-standard in any way, it can be helpful to get a preliminary review by code officials during design development so that potential compliance concerns can be resolved early in the design process. However, jurisdictions and even the various agencies within a jurisdiction vary in their receptivity to this approach. Some will not perform such reviews, while others encourage it.

Even if the jurisdiction will not do a general plan review, they will generally review a particular detail. An A/E who is concerned about some aspect of a design should schedule an appointment with the building department to review the detail in question. To avoid having an inspector interpret the detail differently during construction, the A/E should get written confirmation that the detail has been approved. However, the A/E should realize that the approval will generally be for the detail that was discussed and if there are any changes, the detail may need to be re-approved.

Violation of the building code: negligence versus negligence per se

In some states, an A/E's violation of the building code is viewed as simple negligence; in others it is considered negligence per se. When a violation is viewed as simple negligence, the violation is considered, along with all evidence to determine whether the A/E's conduct fell below the professional standard of care. When a violation is negligence per se, there is a presumption that the A/E's conduct fell below the professional standard of care. The plaintiff's burden of proof is thus much lower; a plaintiff alleging negligence per se does not have to prove that a reasonable A/E would have acted differently—the conduct is automatically considered negligent; the burden is on the A/E to show there were extenuating circumstances.

In order for the violation to be negligence per se, the injured party must belong to the class that the law is designed to protect and the injury must be of the type the law is designed to protect against. As an example, in *Morris v. Horton*, 22 Cal.App.4th 968 (1994), a homeowner brought a negligence per se claim against its contractor, alleging the stairs in the house were narrower and steeper than what was allowed by the building code. The court found while this could be negligence, it was not negligence per se, because the law was designed to prevent people from getting hurt on the stairs. In this case, the only injury the homeowner suffered was the cost to reconstruct the stairs so that they were in compliance with the building code.

It should be emphasized that compliance with applicable codes is not a defense against a negligence claim. Courts have universally held that building codes set only minimum standards. Or more colloquially, "the code sets a floor not a ceiling." The code cannot address every aspect of a particular situation. If a reasonable professional would have designed to a higher standard than what the code required, an A/E that designed to code requirements could be found negligent.

Code consulting: fire and egress modeling

Fire and smoke modeling includes a range of applications such as ensuring a structure can withstand a fire and ensuring smoke does not threaten the building's occupants. Using models such as the National Institute of Standards and Technology's (NIST) Fire Dynamics Simulator (FDS), code consultants can model the effects of a fire on a proposed design and present the results via 3-D computer models that depict those effects, including temperature, smoke movement and toxic gas concentrations. This graphical modeling allows designers, owners and code officials to see the conditions in a proposed building and the level of safety provided by the design.

Fire and smoke modeling is often used in conjunction with egress modeling to demonstrate how fire protection and life safety systems combine to provide for the safety of a building's occupants. Code consultants can also use a variety of simpler models and tools to assist the design team in addressing fire protection and life safety issues. These tools range from engineering calculations and hydraulic–based models to sophisticated video animations that track the movement of individual occupants through a building. A timed egress analysis can be used in conjunction with computer fire modeling to determine if, and to what extent, mechanical smoke control is needed to provide safe exiting for the building's occupants.

Fire and egress modeling allows building designs to move beyond the specific requirements of the codes and provides the design team with increased flexibility. Modeling can be used to develop performance-based solutions for fire protection and life safety issues. This can be extremely helpful in solving design problems, such as when a mixed-use facility needs open access between areas to provide functionality.

Code versus standards

While the building code sets the general requirements that designs must comply with, the specific requirements for materials, equipment and processes are typically specified in standards that are incorporated by reference into the code. For example, Chapter 35 of the IBC lists the standards that are incorporated into the IBC, along with the code sections that reference the standard.

A state or county cannot require that a particular standard apply to all construction; the requirement must be through adoption of a code which references the standard. However, the parties to a contract can agree that a particular standard will apply to the contract by including the requirement in the contract documents, typically in the specifications.

Many of the standards referenced by the IBC and other model codes, as well as those included in specifications, are developed by organizations such as the American National Standards Institute (ANSI), ASTM International (ASTM) and Underwriters Laboratories (UL). Reference standards are also developed by professional associations such as the American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) and trade associations such as the American Institute of Steel Construction (AISC), whose goal is to establish appropriate use of the materials and systems manufactured by their members. Reference standards must be consensus-based, meaning that the standard developer must allow public comments on the standard and that discussions and hearings on new standards and changes to existing standard must also be open to the public.

When a jurisdiction adopts a model building code, it implicitly adopts all of the standards referenced by that model code. Generally, the standards referenced will be the most current editions as of the model code's publication date. However, given the time lag in adopting a model code, the applicable standard in any particular jurisdiction is often not the most current edition of that standard.

This can present a problem if the current edition of a standard prohibits construction allowed by earlier editions or increases safety factors or loading requirements. In such cases, the A/E must consider what a "reasonable A/E under the same circumstances" would do. If most A/E's working in that city or county would know of the changes to the standard and would agree that the changes should be followed, the "professional standard of care" requires the A/E to follow the new, stricter requirements.

It can also present a problem when the same standards are also referenced in the specifications, which is often the case for many of the ASTM standards. Typically the specifications will require use of the most recent version of the standard. To avoid having two different versions of a standard apply to the project, the specifications should state that the applicable standards are "those in effect as of the date of the contract documents, unless a different revision date is specified for the standard under the codes listed on the Drawings."

Confusion sometimes arises because A/E's refer to a number of documents as "codes" when they are actually standards. For example, *ACI 318, Building Code Requirements for Structural Concrete*, is generally referred to as "the concrete code" or just "the code" by engineers who specialize in concrete construction. However, while ACI 318 can be used to set minimum concrete construction requirements in jurisdictions where there is no legally adopted building code, it is not written as a building code. Instead, it is written to be incorporated into a building code. This is made clear in ACI 318 § 1.1.1, which states:

> This Code provides minimum requirements for design and construction of structural concrete members of any structure erected under requirements of the legally adopted general building code of which this Code forms a part.

“Understanding both the client's requirements and the constraints under which the A/E will be working is critical to the process of solving the problem.”

Conclusion

Working with a client to solve a particular design problem is central to what an A/E does. Understanding both the client's requirements and the constraints under which the A/E will be working is critical to the process of solving the problem. These constraints include the resources available for a project, including the means available to cover the costs of construction, fees and other expenses. While compliance with the building code is simply one more constraint on the development of a solution, it is also essential to the development of a solution.

Addendum

Code compliance on federal buildings

There are a number of federal agencies that build, own, operate and/or lease various types of buildings. The General Services Administration (GSA), for example, has an extensive portfolio of office buildings that it builds, owns and operates for other agencies. The Department of Defense constructs and operates thousands of commercial, office and residential buildings, both within the U.S. and abroad, to support the mission of the Armed Forces. The Department of Energy (DoE) and the National Air and Space Agency (NASA) own and operate a variety of building types, including laboratories, research facilities and office buildings. The Veterans Administration (VA) constructs and operates medical facilities such as hospitals, ambulatory care centers, and nursing and long-term care facilities. The Architect of the Capitol maintains a number of buildings in the District of Columbia, including the U.S. Capitol and the House and Senate office buildings.

Under the *Public Buildings Amendments of 1988*, 40 U.S.C. 3312, buildings constructed or altered by a federal agency must comply with nationally recognized codes, to the maximum extent feasible. Both federal Executive Orders and federal laws, such as *The National Technology Transfer and Advancement Act*, 15 U.S.C. §3701, encourage agencies to use standards and codes developed through a voluntary consensus process in lieu of agency-specific requirements, provided the standard or code meets agency needs and achieves agency objectives. The technical requirements of these codes and standards supplement agency requirements mandated by federal laws and Executive Orders, as well as other criteria that have been established to meet the unique requirements of the agency. If there is a conflict between agency-specific requirements and a nationally-recognized code or standard, the agency's requirements will generally prevail.

Federal agencies do not adopt model codes the way state and local governments do, but they do use model codes as requirements when they request bids to construct or renovate their properties and facilities. Their building managers and operators also use various model codes, such as the International Fire Code (IFC), for maintenance and upkeep of the buildings in their portfolios to ensure the safety of their building’s employees and visitors. However, since federal agencies have a direct, contractual relationship with both their own employees and the entities they contract with to build, operate and maintain their buildings, they can require use of the codes without the need to formally adopt the codes into law.

Each federal agency can determine which codes it will follow. For example, the GSA uses the technical requirements of the National Electric Code (NFPA 70) and the I-Codes, but uses the egress requirements of the Life Safety Code (NFPA 101) in lieu of the IBC egress requirements. To ensure flexibility, it is GSA policy to make maximum use of equivalency clauses in all nationally recognized codes. The latest edition of each code in effect at the time the design contract is awarded must be used throughout design and construction of the project.

Legally, buildings on federal property are exempt from state and local building codes and thus would be exempt from any amendments to the model codes. Nevertheless, federal agencies typically recognize that state and local amendments represent important regional interests and conditions. Most agencies comply with state and local building code amendments to the maximum extent practicable. The appropriate state and local government officials must generally be given the opportunity to review projects for compatibility with local plans, zoning, building code compliance and construction inspections. This includes review of drawings and specifications, site inspections, building permits, making recommendations for compliance with local regulations and compatibility with local fire fighting practices. Agencies generally make an effort to incorporate state and local government recommendations, provided they are reasonable with respect to adequacy, cost and nationally accepted practice, and are in the best interest of the government. However, the agency has the final authority to accept or reject any recommendation from state and local government officials.

Where state or local government officials want to perform code compliance construction inspections, the agency must include provisions in the A/E and contractor's contract to handle the additional requirement of coordinating their work with these inspections. However, state and local government officials do not have the authority to reject, accept or make changes to the work; their role is to assist the agency in achieving code compliance.

Agencies must consider all requirements (other than procedural requirements) of zoning ordinances, design guidelines, and similar state and local government laws during the planning process and development of associated environmental documentation for new construction and renovation projects. This includes ordinances relating to landscaping, open space, building setbacks, maximum building height and historic preservation. Local regulations must be followed when designing systems that impact off-site terrain or utility systems, such as storm water runoff, erosion control, sanitary sewers and storm drains, water, gas, electrical power, communications, emergency vehicle access, roads and bridges.

The GSA refers to construction of a new building on private land for government use as "lease construction"; the building will be privately owned but leased to the GSA. In such cases, the applicable state and local government codes, including all local zoning ordinances apply to the construction; the developer/owner of the building must obtain the necessary building permits and approvals from the appropriate state and local government officials. While GSA Facilities Standards do not strictly apply to Lease Construction, they are recommended for significant build-to-lease buildings and are required when the solicitation includes an option for GSA to purchase the building at a future date. When there is a Government Option to Purchase, the GSA-adopted codes apply in addition to the state and local government codes. If the GSA requirements conflict with either state or local government requirements, the GSA requirements take precedence.

Law, statutes, rules and regulations

Contract provisions requiring compliance with codes often actually require compliance with "statutes, laws, ordinances, codes, rules, regulations, standards and orders". Although there is some inconsistency in how these terms are used, typical usage is as follows:

Statutes: A statute is a law passed by a state legislature or Congress.
Laws: The terms "laws" is often a general term for any legal requirement, but strictly speaking, a law refers to a law passed by a state legislature or Congress.

About the author:

Gail S. Kelley is a risk management consultant with Construction*Risk*, LLC. She handles construction and design professional contract reviews and negotiations. Her background includes providing consulting on disputes and claims involving complex engineering issues. As an engineer for many years, Gail performed constructability reviews, due diligence inspections and condition assessments. She provided litigation support for construction defect and delay claims in both state and federal court and evaluated ancillary building components, including vehicle barriers and equipment supports. Gail is a graduate of Cornell University, Massachusetts Institute of Technology and The American University School of Law. She is the author of "Construction Law: An Introduction for Engineers, Architects, and Contractors," published by RSMeans –John Wiley & Sons (2013).

Ordinances: Ordinances are legal requirements passed by a local body (town, city or county). Examples are zoning and parking ordinances.

Codes: A code is a collection of laws addressing a specific topic. Codes can either be adopted as model codes, as most building codes are, or they can be made up of laws passed by the Congress or a state legislature (e.g., tax and bankruptcy codes).

Rules/regulations: When Congress and state legislatures pass laws, the laws rarely contain enough specific language to guide their implementation. It is the responsibility of the appropriate state and federal administrative agencies to fill in the details of new or amended laws with rules and regulations. Although "rules" and "regulations" are often used interchangeably, "rules" is sometimes used to refer to the particular provisions issued by the agency through a rule-making process, whereas "regulations" is used to refer to the collection of rules. Regulations applicable to the construction agency include those issued by the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

Standards: The Specifications for a project will typically reference a number of standards such as those developed by ASTM and ANSI. Standards are also incorporated by reference into the building codes. Strictly speaking, it is not necessary to include a specific requirement to comply with standards; requiring compliance with a law or code would require compliance with any referenced standards. The word "standards" is also used to refer to specific regulations issued by a state or federal agency, however. An example would be the Department of Justice's 2010 ADA Standards for Accessible Design.

Orders: While the word "orders" is a somewhat general term, it most likely refers to Executive Orders issued by either the President or the governor of a state. Federal Executive Orders that apply to construction include those addressing Civil Rights and Equal Employment.

[i] The common law is that law that applies unless a particular issue has been addressed by a statute or a contract. It is also referred to as "judge-made law," as it develops through judicial decisions. Each state has its own common law, based on previous decisions in that state. The holdings of a particular state are not binding on any other state. However, when deciding an issue that has not been addressed by a court in a particular state (a "matter of first impression"), the court may look to the common law of another state for guidance.

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