

Expediting Code Adoptions through Grassroots Efforts

Engaged ACI chapters enhance ACI code advocacy and outreach programs

Advocating for adoption of ACI standards in building codes is now clearly defined in ACI's mission, and ACI has staff members to direct those efforts. However, to effectively and efficiently accomplish this part of the mission, ACI needs help from local members who understand the processes for code development and the target audiences within their local jurisdictions. To assist members in developing a greater understanding of the processes that result in references to ACI standards, this article provides basic information on code development and adoption practices. While it is focused primarily on U.S. model building code development and state and local code adoption, these concepts are also applicable for international adoptions.

There is no national building code in the United States. States and municipalities are the authorities having jurisdiction (AHJ). The statutes for code development vary from state to state, as do the timelines and procedures. Most AHJs adopt a building code based on a model code with modifications that are intended to best satisfy the needs of the local constituents. Three model building codes currently address requirements considered in ACI codes and standards. These are published by the International Code Council (ICC). The model codes developed and maintained by ICC are shown in Fig. 1. Although subject matter in each of these model codes pertains to requirements developed by ACI committees, only two of the model codes currently reference documents developed through the ACI standards development process:

The 2018 International Building Code (IBC) cites:

- “Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies (ACI 216.1-14)”;
- “Building Code Requirements for Structural Concrete and Commentary (ACI 318-14).”

And the 2018 International Residential Code for One- and Two-Family Dwellings (IRC) cites:

- “Building Code Requirements for Structural Concrete and Commentary (ACI 318-14)”;
- “Residential Code Requirements for Structural Concrete (ACI 332-14).”

“Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures (ACI 562)” is not cited in the International Existing Building Code.

However, some authorities have modified or are considering modifying their requirements for existing buildings to include reference to ACI 562. ACI 562 as a reference document is included in the Ohio Building Code and Amendments and the Hawaii State Building Code, and it is cited in the New York City Department of Buildings “Buildings Bulletin 2017-015.”¹

The Stage Is Set

In 2017, the ACI Board of Direction modified the ACI mission: “ACI develops, disseminates, and **advances the adoption of** its consensus-based knowledge on concrete and its uses.” The additional phrase (shown in bold text) was included to recognize that the general public is the ultimate beneficiary of most ACI committee work on standards and certification programs; and it encourages ACI members, as part of a professional society, to advocate for the use of those standards and programs for the benefit of society. Ideally, this is accomplished by having ACI standards and programs properly referenced in the building code. Because most building codes are based on model building codes, the most efficient method is to incorporate ACI standards and programs in the model codes developed by ICC.



Fig. 1: ICC-developed model codes (refer to www.iccsafe.org)

In the ICC process, a group comprising mostly building and fire officials votes on code change proposals that define the provisions to be added or revised in the ICC model building codes. The ACI staff members responsible for implementing the advocacy mission have two major priorities:

- To develop, foster support for, and testify on those code change proposals that reference ACI standards and programs; and
- To testify for the removal from the model building codes those criteria for design and construction that are addressed in ACI standards. However, it is difficult to reach and

influence the decisions of the voters in the ICC process because most are not present during the hearings. Online voting is conducted subsequent to the hearings, and it is difficult for staff working with a few volunteers to effectively reach these decision-makers.

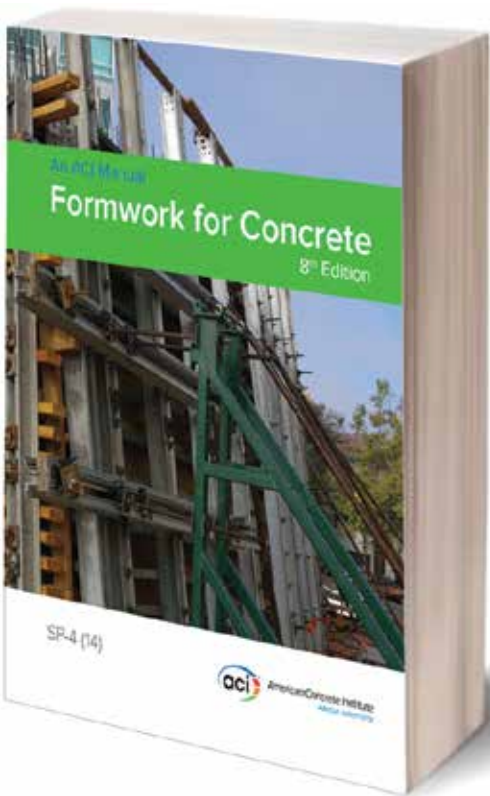
These code officials are not only important contacts in the model building code process but many also influence the modifications to the model building code in their respective jurisdictions. Ideally, code advocacy and outreach include well-orchestrated grassroots initiatives to communicate what ACI is, establish ACI as a resource, and instruct officials on the use and application of ACI standards and programs.

What is ACI?

In venues related to the development of building codes, most of the audience (comprising committees, commissions, officials, and hearing attendees) views ACI as a product or trade association and not as a professional society. The steel and wood industries' design and construction standards are developed by product associations. As product associations, their missions are to make their materials products of choice. The American Institute for Steel Construction (AISC) mission states in part: "...to make structural steel the material of choice..." AISC also develops "Seismic Provisions for Structural Steel Buildings (ANSI/AISC 341-16)" and "Specification for Structural Steel Buildings (ANSI/AISC 360-16)," which are reference standards in the IBC, as is the ACI 318 Code.

While the intent of all these design and construction requirements is for the public good, it is more of a singular purpose of ACI committee work as defined in the Technical Committee Manual: "An ACI code provides minimum requirements for concrete or masonry structures within its scope to safeguard public safety, health, and general welfare." Often there is resistance to proposals prepared and submitted by ACI simply because the audience has concerns that the efforts of

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ACI are intended to promote concrete in lieu of other materials. A simple way to present ACI's primary positions and activities is to advise that ACI products and services come into play once the choice has been made to use concrete on a project.

Ways to communicate this message to government officials include visiting state and local building code departments, attending educational programs at building official association (BOA) meetings, and having a presence at BOA conferences. Like ACI chapters, these BOAs are independent organizations. Most BOAs are chapters of ICC.

ACI as a resource

Most building officials are not readily engaged in verification of the design and construction of requirements for buildings. Thus, while they may have an awareness of the ACI 318 Code because it is referenced in the building code, they are not typically users of the ACI 318 Code and are probably not well versed in its content.

This is not unique to ACI documents, as it would be a monumental task for any building official to be familiar with the contents of the hundreds of reference standards in the IBC. Because it would be challenging to have expertise in the many aspects of building design and construction that are within the purview of their duties and responsibilities, building officials rely heavily on external resources for information about specific building materials, products, components, and systems. Most officials operate under strict budget limitations, however, and do not have the resources to purchase technical documents about materials, products, components, and systems addressed in the building code. Many have access only to technical documents provided as complimentary items from industry, and so they commonly rely on subject-matter experts they know through in-person visits to the building department and through interactions at BOA meetings and events.

Education

As previously discussed, the broad scope of the building code imposes limitations on officials' abilities to keep current on the construction industry's advancements, even though this information often helps them perform their duties better and may even simplify their routine activities. Education is important for officials, and many authorities require Certified Building Officials to participate in continuing education. Again, however, budget limitations make it difficult to participate in educational programs addressed at provisions in the building code, and this constraint limits building officials' use of ACI's on-demand courses. Thus, the primary source for continuing education is through programs conducted at BOA meetings and conferences or online educational programs. Some ACI chapters reach officials with educational programs through occasional joint meetings with the local BOA.

Use of ACI products

Most of the code requirements in ACI documents are written specifically for the design professional. Officials do

not need to know how to design buildings. What officials need is sufficient knowledge about concrete design and construction to understand the intent of the building code. They benefit from basic knowledge about concrete construction and items that require inspection.

Officials are generally not aware of ACI products and services unless they are referenced in the building code. They may not realize the benefits and thus not support or even consider incorporating standards and programs into the building code. Many ACI products and programs help ensure quality concrete construction and warrant inclusion in the building code. Some items that would be extremely helpful references in the building code are:

- "Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures (ACI 562)" to help ensure proper repairs of structural concrete;
- "Specification for Testing Ready Mixed Concrete (ACI 311.6)," especially Section 1.2, Qualifications, which sets requirements for field and laboratory technicians; and
- "Specifications for Inspection of Concrete Construction (ACI 311.7)," especially Section 1.6, Qualifications, which sets requirements for special inspectors.

Creating an awareness of ACI products and services is best accomplished with face-to-face encounters with the appropriate officials. These encounters could be visits to the building department or conversations at BOA events or code development hearings. Because most BOAs are ICC chapters, collaboration and, where possible, joint efforts between ACI and ICC chapters may serve as an excellent way to create this awareness.

During these encounters, it will also be helpful to educate officials about the rigorous ACI standards development process, which requires balanced, broadly representative committees and that all comments must be adjudicated. This vetting is substantially different from the ICC code development process. For example, in the first round of ICC hearings (called Committee Action Hearings [CAH]), a majority vote of committee members determines the disposition of each code change proposal. A committee member decides the fate of a proposal based on the reason statement accompanying the proposal, 2 minutes of testimony from the proposal's advocate, and a 1-minute rebuttal by each individual choosing to speak for or against the proposal. Knowledge of the ACI process will build confidence that would be impossible to generate during a 2-minute oral presentation.

Public good

The charge of ACI standards committees includes public safety, health, and general welfare. When educating and communicating with officials, it is important to address the benefits to the constituents within the jurisdiction. These messages should target those officials involved in the code development process. Building officials involved in plan reviews and enforcement of provisions related to concrete

construction will generally benefit from ACI resources. However, the officials who are the best audience for this information are those directly involved in code administration and working with building code committee members and commissioners.

Process discovery

Every authority has its own unique code development process. Most AHJs base their codes on specific editions of model building codes. AHJs may not adopt all of the model codes, and the edition adopted may be different—for example, an AHJ may base their building and construction code requirements on the 2018 edition of the IBC but base one- and two-family dwelling requirements on the 2009 edition of the IRC. The frequency of adoption may be within the purview of the building code department or may be directed by legislative authorizations.

The applicability of the code also varies greatly among the AHJs. Several scenarios are:

- No statewide building code;
- No statewide code for specific occupancies such as one- and two-family dwellings;
- Statewide code applicable for all buildings or statewide code applicable to only government-owned or -funded projects; and
- Statewide code only applicable to state projects and buildings classified as having a high risk for large loss of life, such as assembly occupancies.

Where there is a statewide building code, there may be limitations on amendments or modifications. Local modifications may be prohibited, more stringent or less stringent, or only more stringent. While this appears complicated, investigation and participation in each state is unique and not cluttered by the processes in all the other states. Information needed to become engaged in the code development process includes:

- Edition of the model code(s) serving as the basis for the building code;
- Code development cycle, usually 3 to 6 years;
- Frequency for submitting proposals. Some AHJs have annual modifications while others may only have modifications once per cycle;
- Specific dates for the code development process. This includes deadlines for submitting proposals and public comments and dates for committee hearings, commission hearings, and rulemaking hearings; and
- Current provisions governing concrete design and construction in the building code, including referenced standards.

A generic timeline of the typical code development process is shown in Table 1, along with the key components of the ICC model code development process. Much of this information is discoverable on AHJ websites, but it isn't always easy to find. The best method for discovering this information is by contacting a code administrator in each AHJ.

Participation

Involvement in the code development process is essential to achieve change. The best possibilities for success result when constituents in the jurisdiction propose and support code change proposals. Generally, AHJs have little or no interest in what other AHJs are doing. Their primary concern is to safeguard the public in their jurisdiction. Whether the model building code or an AHJ's code, anyone can submit a proposed change. Local ACI members may submit and testify in support of code change proposals about adoption of ACI standards and programs with few or preferably no modifications to align the code with ACI requirements. There may also be relevant code change proposals submitted by others. Comments during public comment periods and testimony at the hearings on these proposals help establish ACI as a resource. Submittal of code change proposals and testimony at hearings is the most important role.

Fostering support

Once proposals are submitted, there are generally two comment periods. Soliciting support in the form of written public comments and testimony is extremely important. Support is best provided by constituents within or working in the jurisdiction, especially building officials. Dialogue with code administration staff, technical committee members, and building commissioners may also be very helpful. Fostering support from key individuals whose opinions are respected in the process is also key. The best way to find these contacts is through attendance at the hearings.

General awareness

Creating a public awareness may also be very helpful. Key messages to the public are that ACI is a professional society and that ACI committee documents are developed based on the contributions of hundreds of concrete industry experts. One of ACI's national awareness efforts focused on the public and building codes is sponsorship of the annual ICC Building Safety Month (BSM) in May. While there is national awareness, most activities regarding BSM happen at the state or local level. Activities range from public awareness programs at local building supply stores, to press releases, to mayoral and gubernatorial proclamations.

Support for BSM activities at the local level could be an excellent way to increase awareness about ACI and committee activities and their relation to public safety. To date, the focus of BSM has been the United States, but ICC is planning to take BSM international in 2020. Most BSM activities are conducted by ICC chapters. ACI chapters working with ICC chapters could be an excellent way of creating this general awareness.

Coordination

Reporting on activities is extremely valuable as it allows for coordination. Information that should be shared includes: 1) timelines for code development; and 2) any proposals,

public comments, or testimony offered. ACI now has two Code Advocacy Engineers—Kerry Sutton, kerry.sutton@concrete.org, and Steve Szoke, steve.szoke@concrete.org—who are available to support adoption of ACI standards and programs. Consider using them as a resource, and please let them know of your interest in taking part on specific proposals, including willingness to submit proposals, submit public comments, foster support, and supply testimony.

It Does Work

ACI 562 has been adopted in Hawaii and Ohio. Both efforts were championed by ACI volunteers, with the latter having some support and coordination provided by ACI staff. In Georgia, structural engineers working with industry groups were able to add provisions that identified ACI Concrete Construction Special Inspectors as qualified to conduct special inspections. This was accomplished by adding Table 1704.2, Minimum Special Inspector Qualifications, to the “Georgia State Amendments to the International Building Code.”² The

table addresses special inspection of steel, concrete, masonry, wood, foundations, and other materials and systems. Excerpts related to concrete are shown in Table 2. The initial proposal included ACI Concrete Construction Special Inspector, and the concrete industry in Georgia added ACI Concrete Field Testing Technician—Grade I certification. It is important to share and coordinate this information to help others identify opportunities, collaborate, and, to the extent possible, coordinate efforts and lend support.

It is not cost-effective for ACI to have enough staff to champion efforts within every AHJ (or even the major AHJs). ACI volunteers are needed to help ACI accomplish its mission. While staff members are available to help in the development of proposals, public comments, and testimony, the most affordable, effective, and efficient delivery is through individual ACI members coordinating efforts and gaining additional support through ACI chapters and, where deemed appropriate, increased ACI chapter activities with building officials.

Table 1:
Code development sequence

Authority code development	International Code Council
Technical committee review ^{**}	—
Proposal submittal deadline [†]	Proposal submittal deadline for Group A ^{‡,§}
Proposals posted for public review [†]	Group A proposals posted for public review [†]
Public comment period for proposals	Public comment period for Group A proposals
First technical committee hearings	Committee action hearing (CAH) for Group A proposals
First technical committee actions are posted [†]	Results of CAH for Group A proposals are posted [†]
Public comment period on technical committee	Public comment period for Group A CAH results
Second technical committee hearings	Public comment hearing (PCH) for Group A
Second technical committee hearing results are posted [†]	Results of PCH for Group A are posted [†]
Building commission hearing	Online voting by qualified officials
Results of building commission hearing posted [¶]	Final actions for Group A proposals are posted [†]
First rulemaking workshop [#]	Proposal submittal deadline for Group B ^{‡,§}
Results of first rulemaking workshop posted [†]	Group B proposals posted for public review [†]
Second rulemaking workshop [#]	Public comment period for Group B proposals
Results of second rulemaking workshop posted [†]	CAH for Group B proposals [#]
Final draft of revised code posted [†]	Results of CAH for Group B proposals are posted [†]
Final rulemaking hearing	Public comment period for Group B CAH results
—	PCH for Group B proposals
—	Results of PCH for Group B proposals are posted [†]
Approval by regulatory or legislative authority	Online voting by qualified officials
—	Final actions for Group B proposals are posted [†]
New edition of the code is published	Model building code published
New edition of the code becomes effective	—

^{*}Public comment periods are typically 45 days; [†]Staff function; [‡]Public input; [§]The number of proposals dictates grouping by subject matter into two rounds of hearings; [¶]First draft of the revised code; [#]Hearing

Table 2:
Excerpts from table in the Georgia State Amendments²

Minimum Special Inspector qualifications	
Category of testing and inspection	Minimum qualifications: Field testing or inspection
1705.3 and 1705.12 Concrete Construction	
Reinforcing placement, cast-in-place bolts, post-installed anchors, concrete and shotcrete placement, and curing operations. Inspection of formwork for shape, location, and dimensions	A, C, H
Prestressing steel installation	A, C, D, E
Erection of precast concrete members	A, C, H
Concrete field sampling and testing	A, J
Verify use of required mixture design	A, I, J, H, C
Post-tensioned concrete force application	A, C, D
Review of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs	A, C, D, H
Reinforcing steel weldability, reinforcing welding, weld filler material	C, F
Testing of welding of reinforcing steel	G

- Note:
- A = Georgia Professional Engineer (GA PE) competent in the specific task area or graduate of accredited engineering/engineering technology program under the direct supervision of a GA PE
 - C = International Code Council (ICC) Special Inspector Certification specific to the particular material and testing methodology applicable to each category of testing and inspection listed in the table
 - D = Post-Tensioning Institute (PTI) Certification, Level 2, bonded or unbonded as applicable
 - E = Precast/Prestressed Concrete Institute (PCI) Certified Inspector
 - F = American Welding Society (AWS) Certified Welding Inspector (CWI) or AWS Certified Associate Welding Inspector working under the direct on-site supervision of a CWI
 - G = American Society for Nondestructive Testing (ASNT) Level II certification or a Level III certification if previously certified as a Level II in the particular material and testing methodology applicable to each category of testing and inspection listed in the table
 - H = ACI Concrete Construction Special Inspector
 - I = National Institute for Certification in Engineering Technologies (NICET) Level II or higher certification specific to the particular material and testing methodology applicable to each category of testing and inspection listed in the table
 - J = ACI Concrete Field Testing Technician with Grade I certification

Code advocacy and outreach happens at the local level and thus would benefit from ACI chapter engagement. ACI chapter engagement in building code adoption activities is far from new. In fact, the objectives of the very first ACI chapter, Southern California Chapter – ACI, established in 1958, included “stimulate participation and interest in the programs of ACI, including educating local authorities and organizations on the value of referencing the ACI Building Code in the concrete portions of their local building codes.”³

Support the ACI mission by starting the dialogue and becoming engaged.

References

1. “Buildings Bulletin 2017-015,” NYC Department of Buildings, New York, NY, Dec. 12, 2017, 3 pp. www1.nyc.gov/site/buildings/codes/building-bulletins-2017.page.
2. “Georgia State Amendments to the International Building Code (2018 Edition),” Georgia Department of Community Affairs, Atlanta, GA, Jan. 1, 2020 (revised), 42 pp.

3. Forster, C., “History of the ACI Chapters,” *Concrete International*, V. 36, No. 10, Oct. 2014, pp. 47-49.

Note: Additional information on the ACI codes and standards, ICC codes, and AISC specifications discussed in this article can be found at www.concrete.org, www.iccsafe.org, and www.aisc.org, respectively.

Selected for reader interest by the editors.



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