New Standards – New Venues

Destiny of Concrete – Rules and Regulations

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ACI Mission

ACI develops, disseminates, and advances the adoption of its consensus-based knowledge on concrete and its uses.

ACI Technical Committee Manual

4.1.1.1 Code requirements

An ACI code provides minimum requirements for concrete or masonry structures within its scope to safeguard public safety, health, and general welfare. Codes may be adopted by a model building code or by a regulatory agency or may be used by an industrial or governmental organization for which construction or manufacture of a work which uses concrete.

Stepping Back in Time

1910 - Standard Building Regulations for the Use of Reinforced Concrete National Association of Cement Users

1913 - NACU becomes American Concrete Institute

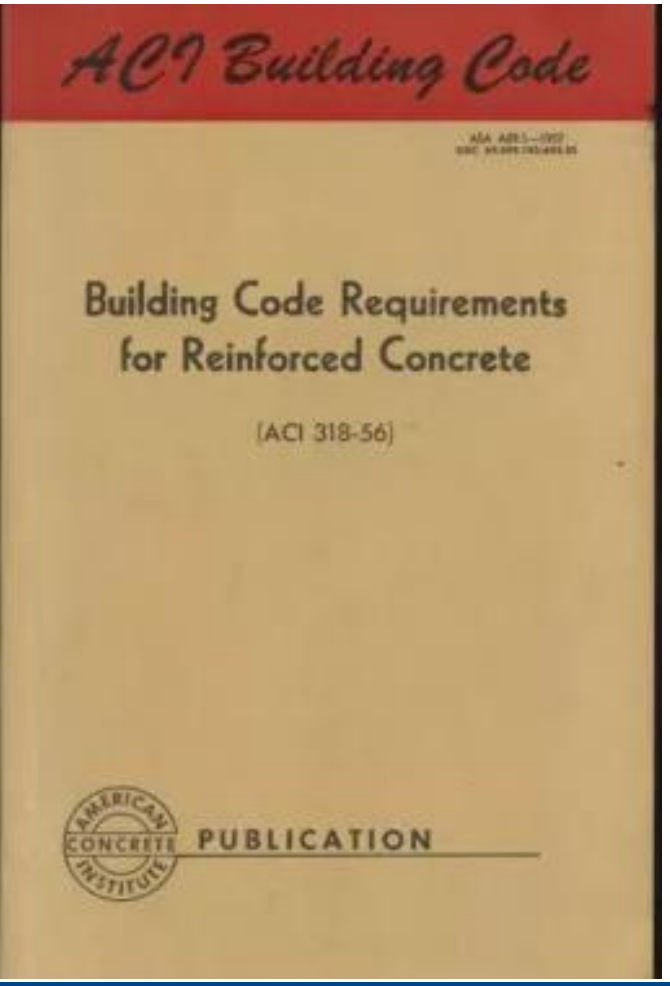
1927 – First Model Code available

1941 - "ACI 318" in the title of SBR for the Use of RC

1950 – Second and Third Model Codes available

1956 - Ultimate Strength Method introduced

Always Advancing – Always Adapting



ACI 318-56
Building Code Requirements for Reinforced Concrete

Southern CA ACI Chapter

The objective of first ACI chapter, Southern California Chapter, 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."

Model Codes

Uniform Building Code

ICBO - International Conference of Building Officials

1927-1997

National Building Code

BOCA - Building Officials and Code Administrators

1950-1997

Southern Standard Building Code

SBCCI - Southern Standard Building Code Congress

1950-1997

Model Codes = 19

ICC – International Code Council

International Building Code
International Energy Conservation Code
International Existing Building Code
International Fire Code
International Fuel Gas Code
International Green Construction Code
International Mechanical Code
International Plumbing Code
International Property Maintenance Code
Private Sewage Disposal Code
International Residential Code
International Swimming Pool and Spa Code
International Wildland Urban Interface Code
International Zoning Code
ICC Performance Code

NFPA - National Fire Protection Association

1 Fire Code
70 National Electrical Code
101 Life Safety Code
5000 Building Construction and Safety Code

Model Codes = 19

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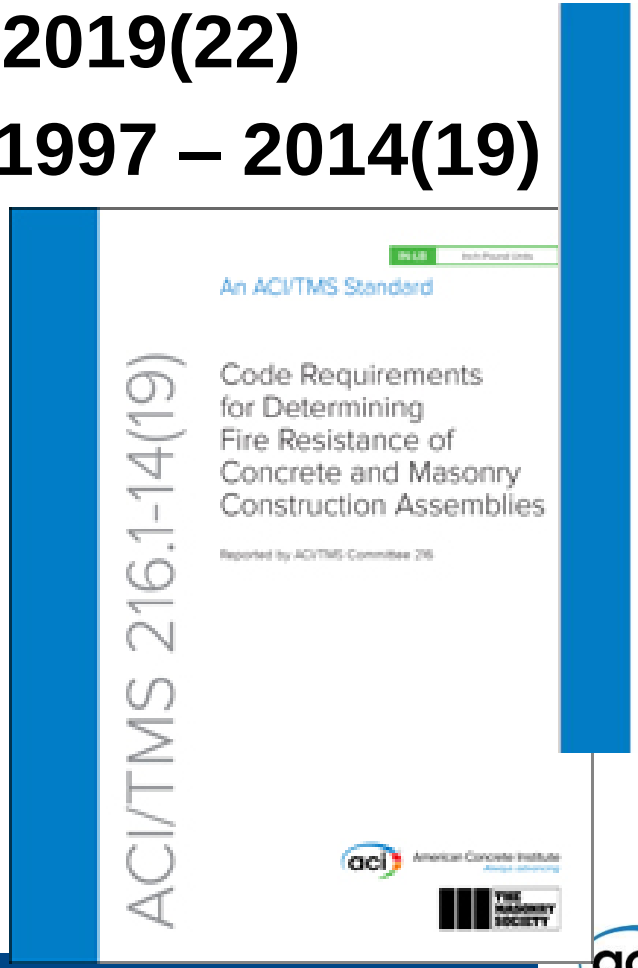
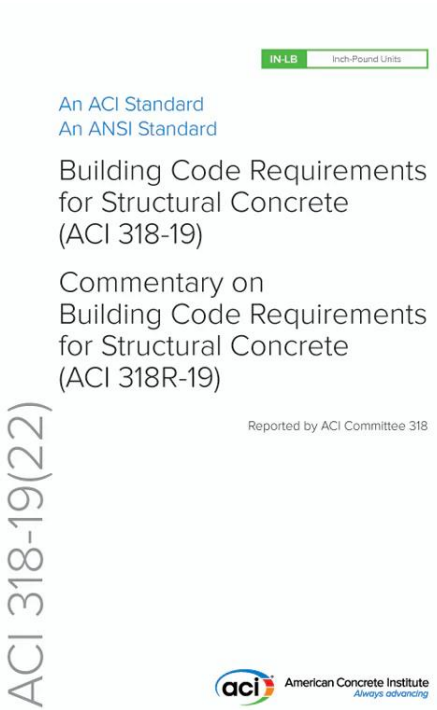
ACI Reference Standards pre-2006

- **ACI 318 – 1941 – 2019(22)**
- **ACI/TMS 216.1 – 1997 – 2014(19)**





References in ICC Model Building Codes

ACI	2000	2003	2006	2009	2012	2015	2018	2021	2024
117 – Tolerances (C-I-P)								X	X
216.1 – Fire Protection	X	X	X	X	X	X	X	X	X
318 – Structural Design	X	X	X	X	X	X	X	X	X
332 – Residential Concrete			X	X	X	X	X	X	X
440.11 – GFRP Rebars									X
550.5 – Precast Diaphragms								X	X
562 – Repair									X
ITG-7 – Tolerances (Precast)								X	X
TG/T1.1 – Moment Frames		X							

New Standards - Traditional Venues

International Swimming Pool and Spa Code

- 322 Watershapes

New Standards – Non-Traditional Venues

International Energy Conservation Code

- 122.1 Thermal Bridge Mitigation
- 122.2 Residential Energy Code Compliance
- 122.3 Commercial Energy Code Compliance

ASHRAE 90.1

- 122.1 Thermal Bridge Mitigation
- 122.3 Commercial Energy Code Compliance

New Standards – Non-Traditional Venues

ACI 323 Low Carbon

Local Ordinances

Government Procurement Rules

US Green Building Council

- **Leadership in Energy and Environmental Design**

Green Building Initiative

- **Carbon Reduction Program**

Structural Engineering Institute

- **SE 2050 – Committing to Net Zero**

New Standards – Non-Traditional Venues

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New Standards – Non-Traditional Venues

ASCE 24 – Flood Resistance Construction

Standard:

- ACI 318

Commentary

- ACI 201.2 Durable concrete
- ACI 222.3 – Mitigate corrosion
- ACI 302.1R – Floors and slabs
- ACI 350 – Environmental structures
- ACI 440.1 – Design and construction with FRP
- ACI MNL7 - GFRP

ASCE 24

OK

NG

IBC

1402.5.6 Fiber-Reinforced Polymer. Exterior Walls containing fiber-reinforced polymer shall comply with Section 2613.

- Flame spread
- Combustibility

IBC

1402.5.6 Fiber-Reinforced Polymer. Exterior Walls containing fiber-reinforced polymer shall comply with Section 2613.

Exception: Exterior walls where the only FRP is fiber reinforced polymer reinforcing bars embedded in concrete in accordance with Section 1901.2.1 or masonry in accordance with Section 2101.2.

ASCE XX - Foundations

- 207 – Mass Concrete
- 336 – Footings, Mats, Drilled Piers
- 351 – Dynamic/Static Equipment
- 543 – Concrete Piles

ICC Existing Building Guide

- 364.1 – Assessment before rehab
- 562 – Repair code
- 364.10 – Rebar section loss
- 222.3 – Corrosion mitigation
- 515.2 – Protective treatments
- 515.3 – Surface preparations
- 214.4 – Obtaining cores
- 360 – Evaluation
- 437.1 – Load tests
- 228.4 – Visual survey

ICC Standards

- 500 Storm shelters
- 600 Residential high wind
- 700 Green building
- 605 Wildfire
- 1150 3D printed concrete
- 805 Rainwater harvesting
- 1200 Off-site construction
- 1155 Low carbon cement
- 1500 Existing bldg. safety

Advocacy – Key Stakeholders

Alternative Materials	
AISI/AISC (Steel) AWC (Wood)	Local chapters material providers and installers
Architectural	
AIA	AIA chapters
Building Owners	
BOMA	BOMA chapters
Code Development	
Officials attending model code hearings	Building code departments ICC chapters

Advocacy – Key Stakeholders

Concrete and Related Products

ACCS	Regional and state associations

Disaster Mitigation

FEMA	Emergency mangers

Environmental

ASHRAE	DNR
EPA	ASHRAE chapters
GBI	Regional and state entities
USGBC	
DOE	

Advocacy – Key Stakeholders

Engineering

ASCE	ASCE chapters
SEI	Structural engineering
NCSEA	institutes/associations

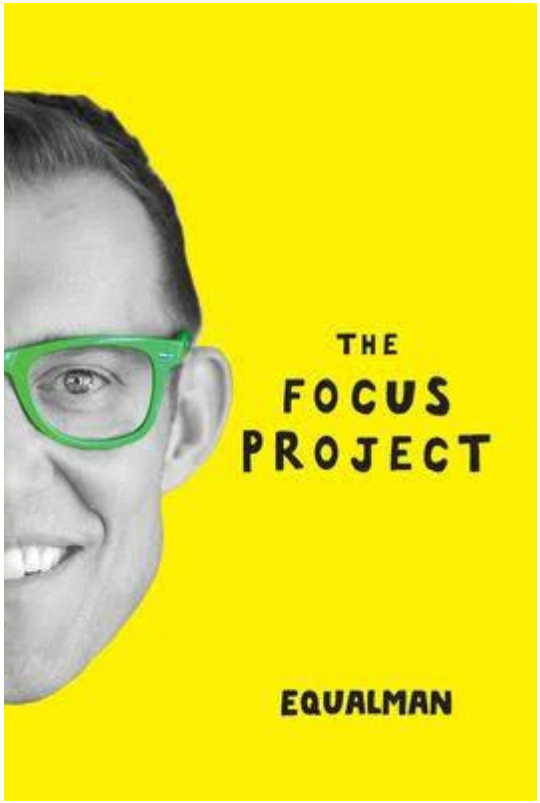
Home Building

NAHB	Home building associations
NMHC	

Eric Qualman = Equalman
Digital Leader

The Focus Project:

Not So Simple Art of Doing Less



What You Can Do

Identify process, players, and timelines

Educate code developers and stakeholders

Create awareness of current and futures ACI standards

Communicate public benefits of compliance with ACI standards

Demonstrate benefits of compliance to stakeholders

Discover opportunities

New ACI standards to fill voids

November CI

Concrete international
The Magazine of the Concrete Community

Evolution of Codes and Rules: The Journey of Ideas to Practice

by David G. Tepke and Stephen S. Szoke

Codes are only part of a long line of components needed to transform an idea into an application that solves an industry need. Figure 1 illustrates how an idea might evolve into legal code requirements and then into an application, and Table 1 describes many potential timelines associated with the process. While the process can generally take quite some time, more rapid development tends to occur when there is an urgency—especially for revisions or provisions that directly improve life safety. Provided herein is an overview of the process, including some context about the steps and synergies.

With respect to concrete standards produced by ACI, the ACI Technical Committee Manual (ACI TCM-24)[1] describes the types of standards that can be produced by ACI committees that have been authorized by ACI's Technical Activities Committee. These document types include code requirements; code cases; acceptance criteria; and specifications governing design, construction, materials, test methods, or inspection and testing services. Standards may contain design, construction, sustainability, resiliency, durability, assessment, maintenance, repair, and rehabilitatio requirements and must be worded in explicit, mandatory language so that there is only one possible interpretation. Construction standards are written to direct the producers, testing agencies, and construction team—not the design professional.

The functions and features of design standards, as described in the ACI TCM-24, are summarized in Table 2. ACI standards classified as code requirements are intended t provide minimum requirements for concrete structures withi their scope to safeguard public safety, health, and general welfare, or to satisfy other societal needs. For example, ACI CODE-318, "Building Code Requirements for Structural Concrete," provides minimum requirements for public safety ACI CODE-323, "Low-Carbon Concrete—Code Requirements in final development when this article was published, and AC CODE-321, "Concrete Durability Code," also in developme are examples of minimum requirements to satisfy societal needs, namely those associated with environmental responsibility and building longevity, respectively.

Advocacy You Can Do!

Local advocacy is an important part of the adoption process

Whether it is a local, state, national, or model building code, grassroots code advocacy is an essential part of the code development process. The work of ACI members is not complete when building code requirements (standards) are published or a certification program is launched. This was recognized by ACI leadership a decade ago when the ACI mission was updated to include "and advances the adoption of its consensus-based knowledge." The complete mission statement is: "ACI develops, disseminates, and advances the adoption of its consensus-based knowledge on concrete and its uses."

When ACI chapters were first being formed, their activities included the adoption of ACI CODE-318 by reference in state and local building codes. The objective of the first ACI chapter, Southern California Chapter, 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." At that time, ACI CODE-318, "Building Code Requirements for Structural Concrete," was the only ACI standard intended for adoption into general and model building codes. In 1958, national model building codes did not exist in the United

for more referenceable standards in the building codes, and ACI technical committees are stepping up to fill these voids. The new demand is linked directly to the increasing complexity of design and construction, which is often difficult to integrate directly into the language of the building codes and other regulations. Also, new standards often facilitate compliance by enforcement officials. As new standards are developed, ACI needs to re-engage state and local advocacy.

ACI is a member-driven professional society with staff supporting the member activities relevant to ACI document development, programs, and services. As with all ACI programs, members need to be actively engaged in code advocacy, especially at the state and local level, where outreach from ACI World Headquarters is most challenging.

Further, the ACI Technical Committee Manual (Section 4.1.1.1) identifies its "code requirements" as:

"…provides minimum requirements for concrete or masonry structures within its scope to safeguard public safety, health, and general welfare. Codes may be adopted by a model building code or by a regulatory agency or may be used by an industrial or governmental organization for which construction or manufacture of a work which uses concrete."

As an organization of industry professionals, it is not

Tepke, Szoke

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THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE

aci CONCRETE CONVENTION

Thank you!

Go Out and Advocate!

And the Public Will Thank You Too!