CHAPTER 1—GENERAL

CODE

1.1—Scope of ACI CODE-318

1.1.1 This chapter addresses (a) through (h):

(a) General requirements of this Code
(b) Purpose of this Code
(c) Applicability of this Code
(d) Interpretation of this Code
(e) Definition and role of the building official and the licensed design professional
(f) Construction documents
(g) Testing and inspection
(h) Approval of special systems of design, construction, or alternative construction materials

1.2—General

1.2.1 ACI CODE-318, "Building Code Requirements for Structural Concrete," is hereafter referred to as "this Code."

1.2.2 In this Code, the general building code refers to the building code adopted in a jurisdiction. When adopted, this Code forms part of the general building code.

1.2.3 The official version of this Code is the English language version, using inch-pound units, published by the American Concrete Institute.

1.2.4 In case of conflict between the official version of this Code and other versions of this Code, the official version governs.

1.2.5 This Code provides minimum requirements for the materials, design, construction, and strength evaluation of structural concrete members and systems in any structure designed and constructed under the requirements of the general building code.

1.2.6 Modifications to this Code that are adopted by a particular jurisdiction are part of the laws of that jurisdiction, but are not a part of this Code.

1.2.7 If no general building code is adopted, this Code provides minimum requirements for the materials, design, construction, and strength evaluation of members and systems in any structure within the scope of this Code.

COMMENTARY

R1.1—Scope of ACI CODE-318

R1.1.1 The Code includes provisions for the design of concrete used for structural purposes, including plain concrete; concrete containing nonprestressed reinforcement, prestressed reinforcement, or both; and anchoring to concrete. This chapter includes a number of provisions that explain where the Code applies and how it is to be interpreted.

R1.2—General

R1.2.1 The commentary refers to ACI CODE-318 as "the Code."

R1.2.2 The American Concrete Institute recommends that the Code be adopted in its entirety.

R1.2.3 Committee 318 develops the Code in English, using inch-pound units. Two translations are published by ACI:

(a) In English using SI units (ACI CODE-318-25—Building Code Requirements for Structural Concrete [SI International System of Units])
(b) In Spanish using SI units (ACI CODE-318-25—Requisitos de Reglamento para Concreto Estructural)

R1.2.5 The Code provides minimum requirements and exceeding these minimum requirements is not a violation of the Code.

The licensed design professional may specify project requirements that exceed the minimum requirements of the Code.

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1.3—Purpose

1.3.1 The purpose of this Code is to provide for public health and safety by establishing minimum requirements for strength, stability, serviceability, durability, and integrity of concrete structures.

1.3.2 This Code does not address all design considerations.

1.3.3 Construction means and methods are not addressed in this Code.

1.4—Applicability

1.4.1 This Code shall apply to concrete structures designed and constructed under the requirements of the general building code.

1.4.2 Provisions of this Code shall be permitted to be used for the assessment, repair, and rehabilitation of existing structures.

1.4.3 Applicable provisions of this Code shall be permitted to be used for structures not governed by the general building code.

1.4.4 The design of thin shells and folded plate concrete structures shall be in accordance with ACI CODE-318.2, "Building Code Requirements for Concrete Thin Shells."

1.4.5 This Code shall apply to the design of slabs cast on stay-in-place, noncomposite steel decks.

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R1.3—Purpose

R1.3.1 The Code provides a means of establishing minimum requirements for the design and construction of structural concrete, as well as for acceptance of design and construction of concrete structures by the building officials or their designated representatives. The Code does not provide a comprehensive statement of all duties of all parties to a contract or all requirements of a contract for a project constructed under the Code.

R1.3.2 The minimum requirements in the Code do not replace sound professional judgment or the licensed design professional's knowledge of the specific factors surrounding a project, its design, the project site, and other specific or unusual circumstances of the project.

R1.4—Applicability

R1.4.2 Specific provisions for assessment, repair, and rehabilitation of existing concrete structures are provided in ACI CODE-562. Existing structures in ACI CODE-562 are defined as structures that are complete and permitted for use.

R1.4.3 Structures such as arches, bins and silos, blast-resistant structures, chimneys, underground utility structures, gravity walls, and shielding walls involve design and construction requirements that are not specifically addressed by the Code. Many Code provisions, however, such as concrete quality and design principles, are applicable for these structures. Recommendations for design and construction of some of these structures are given in the following:

- "Requirements for Reinforced Concrete Chimneys—Code and Commentary" (ACI CODE-307)
- "Design Specification for Concrete Silos and Stacking Tubes for Storing Granular Materials" (ACI SPEC-313)
- "Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary" (ACI CODE-349)
- "Code for Concrete Containments" (ASME BPVC III-2)

R1.4.5 In its most basic application, the noncomposite steel deck serves as a form, and the concrete slab is designed to resist all loads, while in other applications the concrete

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1.4.6 For one- and two-family dwellings, multiple single-family dwellings, townhouses, and accessory structures to these types of dwellings, the design and construction of cast-in-place footings, foundation walls, and slabs-on-ground in accordance with ACI CODE-332 shall be permitted.

1.4.7 This Code does not apply to the design and installation of cast-in-place concrete deep foundation members that are smaller than 10 in. in diameter, or precast concrete deep foundation members with the least side dimension smaller than 10 in.

1.4.8 This Code does not apply to design and construction of slabs-on-ground, unless the slab transmits vertical loads or lateral forces from other portions of the structure to the soil.

1.4.9 This Code does not apply to the design of concrete members reinforced with fiber-reinforced polymer (FRP) bars.

1.4.10 This Code does not apply to the design and construction of tanks and reservoirs.

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slab may be designed to resist only the superimposed loads. The design of a steel deck in a load-resisting application is given in "Standard for Steel Deck" (SD). The SDI standard refers to the Code for the design and construction of the structural concrete slab.

R1.4.6 ACI CODE-332 addresses only the design and construction of cast-in-place footings, foundation walls supported on continuous footings, and slabs-on-ground for limited residential construction applications.

The 2021 IBC requires design and construction of residential post-tensioned slabs on expansive soils to be in accordance with PTI DC10.5, which provides requirements for slab-on-ground foundations, including soil investigation, design, and analysis. Guidance for the design and construction of post-tensioned slabs-on-ground that are not on expansive soils can be found in ACI PRC-360. Refer to R1.4.8.

R1.4.7 Provisions for the design and construction of small concrete piles, including micropiles, are regulated by the general building code. The least side dimension of 10 in. in precast concrete deep foundation members refers to that of a square, or the shortest side of a rectangular cross section, or, for the case of octagonal piles, the diameter of the largest circle that can be inscribed in the octagon.

R1.4.8 Detailed recommendations for design and construction of slabs-on-ground and floors that do not transmit vertical loads or lateral forces from other portions of the structure to the soil are given in ACI PRC-360. This guide presents information on the design of slabs-on-ground, primarily industrial floors and the slabs adjacent to them. The guide addresses the planning, design, and detailing of the slabs. Background information on the design theories is followed by discussion of the soil support system, loadings, and types of slabs. Design methods are given for structural plain concrete, reinforced concrete, shrinkage-compensating concrete, and post-tensioned concrete slabs.

R1.4.9 ACI CODE-440.11 provides requirements and recommendations for the design and limited applicability of concrete members reinforced with Glass Fiber-Reinforced Polymer (GFRP) bar reinforcement. In structures containing both steel- and GFRP-reinforced concrete members, design of steel-reinforced members is governed by the Code; the design of GFRP-reinforced members is governed by ACI CODE-440.11. The design of "hybrid" members with mixed reinforcement types (steel and FRP) and members strengthened with FRP are outside the scope of ACI CODE-318 and CODE-440.11.

R1.4.10 Requirements and recommendations for the design and construction of tanks and reservoirs are given in ACI CODE-350, ACI PRC-334.1, and ACI PRC-372.

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1.4.11 This Code does not apply to composite design slabs cast on stay-in-place composite steel deck. Concrete used in the construction of such slabs shall be governed by this Code, where applicable. Portions of such slabs designed as reinforced concrete are governed by this Code.

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R1.4.11 In this type of construction, the steel deck serves as the positive moment reinforcement. The design and construction of concrete-steel deck slabs is described in "Standard for Steel Deck" (SD). The standard refers to the appropriate portions of the Code for the design and construction of the concrete portion of the composite assembly. SD also provides guidance for design of composite-concrete-steel deck slabs. The design of negative moment reinforcement to create continuity at supports is a common example where a portion of the slab is designed in conformance with the Code.

1.5—Interpretation

R1.5—Interpretation

1.5.1 The principles of interpretation in this section shall apply to this Code as a whole unless otherwise stated.

1.5.2 This Code consists of chapters and appendixes, including text, headings, tables, figures, footnotes to tables and figures, and referenced standards.

1.5.3 The Commentary consists of a preface, introduction, commentary text, tables, figures, and cited publications. The Commentary is intended to provide contextual information, but is not part of this Code, does not provide binding requirements, and shall not be used to create a conflict with or ambiguity in this Code.

1.5.4 This Code shall be interpreted in a manner that avoids conflict between or among its provisions. Specific provisions shall govern over general provisions.

R1.5.4 General provisions are broad statements, such as a building needs to be serviceable. Specific provisions, such as explicit reinforcement distribution requirements for crack control, govern over the general provisions.

1.5.5 This Code shall be interpreted and applied in accordance with the plain meaning of the words and terms used. Specific definitions of words and terms in this Code shall be used where provided and applicable, regardless of whether other materials, standards, or resources outside of this Code provide a different definition.

R1.5.5 ACI Concrete Terminology (CT) is the primary resource to help determine the meaning of words or terms that are not defined in the Code. Dictionaries and other reference materials commonly used by licensed design professionals may be used as secondary resources.

1.5.6 The following words and terms in this Code shall be interpreted in accordance with (a) through (e):

(a) The word "shall" is always mandatory.
(b) Provisions of this Code are mandatory even if the word "shall" is not used.
(c) Words used in the present tense shall include the future.
(d) The word "and" indicates that all of the connected items, conditions, requirements, or events shall apply.
(e) The word "or" indicates that the connected items, conditions, requirements, or events are alternatives, at least one of which shall be satisfied.

1.5.7 In any case in which one or more provisions of this Code are declared by a court or tribunal to be invalid, that ruling shall not affect the validity of the remaining provi-

R1.5.7 The Code addresses numerous requirements that can be implemented fully without modification if other requirements in the Code are determined to be invalid. This

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sions of this Code, which are severable. The ruling of a court or tribunal shall be effective only in that court's jurisdiction, and shall not affect the content or interpretation of this Code in other jurisdictions.

1.5.8 If conflicts occur between provisions of this Code and those of standards and documents referenced in Chapter 3, this Code shall apply.

1.6—Building official

1.6.1 All references in this Code to the building official shall be understood to mean persons who administer and enforce this Code.

1.6.2 Actions and decisions by the building official affect only the specific jurisdiction and do not change this Code.

1.6.3 The building official shall have the right to order testing of any materials used in concrete construction to determine if materials are of the quality specified.

1.7—Licensed design professional

1.7.1 All references in this Code to the licensed design professional shall be understood to mean the engineer in either 1.7.1.1 or 1.7.1.2.

1.7.1.1 The licensed design professional responsible for, and in charge of, the structural design.

1.7.1.2 A specialty engineer to whom a specific portion of the structural design has been delegated subject to the conditions of (a) and (b).

(a) The authority of the specialty engineer shall be explicitly limited to the delegated design.
(b) The portion of the design delegated shall be well defined such that responsibilities and obligations of the parties are apparent.

1.8—Construction documents and design records

1.8.1 The licensed design professional shall provide in the construction documents the information required in Chapter 26 and that required by the jurisdiction.

1.8.2 Calculations pertinent to design shall be filed with the construction documents if required by the building official. Analyses and designs using computer programs shall be permitted provided design assumptions, user input, and computer-generated output are submitted. Model analysis shall be permitted to supplement calculations.

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severability requirement is intended to preserve the Code and allow it to be implemented to the extent possible following legal decisions affecting one or more of its provisions.

R1.6—Building official

R1.6.1 Building official is defined in 2.3.

R1.6.2 Only the American Concrete Institute has the authority to alter or amend the Code.

R1.7—Licensed design professional

R1.7.1 Licensed design professional is defined in 2.3.

R1.7.1.2 A portion of the design may be delegated to a specialty engineer during the design phase or to the contractor in the construction documents. Examples of design delegated to a specialty engineer or contractor include elements of precast concrete and post-tensioned concrete design.

R1.8—Construction documents and design records

R1.8.1 The provisions of Chapter 26 for preparing project drawings and specifications are, in general, consistent with those of most general building codes. Additional information may be required by the building official.

R1.8.2 Documented computer output is acceptable instead of manual calculations. The extent of input and output information required will vary according to the specific requirements of individual building officials. However, if a computer program has been used, only skeleton data should normally be required. This should consist of sufficient input and output data and other information to allow the building official to perform a detailed review and make comparisons using another program or manual calculations. Input

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data should be identified as to member designation, applied loads, and span lengths. The related output data should include member designation and the shears, moments, and reactions at key points in the span. For column design, it is desirable to include moment magnification factors in the output where applicable.

The Code permits model analysis to be used to supplement structural analysis and design calculations. Documentation of the model analysis should be provided with the related calculations. Model analysis should be performed by an individual having experience in this technique.

1.9—Testing and inspection

1.9.1 Concrete materials shall be tested in accordance with the requirements of Chapter 26.

1.9.2 Concrete construction shall be inspected in accordance with the general building code and in accordance with Chapter 26.

1.9.3 Inspection records shall include information in accordance with Chapter 26.

1.10—Approval of special systems of design, construction, or alternative construction materials

1.10.1 Sponsors of any system of design, construction, or alternative construction materials within the scope of this Code, the adequacy of which has been shown by successful use or by analysis or test, but which does not conform to or is not covered by this Code, shall have the right to present the data on which their design is based to the building official or to a board of examiners appointed by the building official. This board shall be composed of competent engineers and shall have authority to investigate the data so submitted, require tests, and formulate rules governing design and construction of such systems to meet the intent of this Code. These rules, when approved by the building official and promulgated, shall be of the same force and effect as the provisions of this Code.

R1.10—Approval of special systems of design, construction, or alternative construction materials

R1.10.1 New methods of design, new materials, and new uses of materials should undergo a period of development before being covered in a code. Hence, good systems or components might be excluded from use by implication if means were not available to obtain acceptance.

For special systems considered under this section, specific tests, load factors, deflection limits, and other pertinent requirements should be set by the board of examiners, and should be consistent with the intent of the Code.

The provisions of this section do not apply to model tests used to supplement calculations under 1.8.2 or to strength evaluation of existing structures under Chapter 27.