The code portion of this document covers the design and construction of cast-in-place concrete one- and two-family dwellings and multiple single-family dwellings (townhouses), and their accessory structures.

Among the subjects covered are the design and construction requirements for plain and reinforced concrete footings, foundation walls, and slabs-on-ground, and requirements for concrete, reinforcement, forms, and other related materials.

The quality and testing of materials used in this document are covered by reference to the appropriate ASTM standards.

The code is written in a format that allows adoption by reference in a general building code without change to its language. Background details or suggestions for carrying out the requirements or intent of the code portion are not included. The commentary is provided for this purpose. The commentary discusses some of the considerations of the committee in developing the code portion with emphasis given to the explanation of provisions that may be unfamiliar to code users or where significant departure exists from other concrete codes. Commentary provisions begin with an “R,” such as “R1.1.1,” and are shown in italics.

References to relevant resource documents are cited for the user who desires to study individual issues in greater detail.

Keywords: admixtures; aggregates; air entrainment; anchorage (structural); backfill; building codes; calcium chloride; cements; cold weather construction; compressive strength; concrete; concrete construction; concrete slabs; construction joints; contraction joints; cover; curing; fiber reinforcement; flexural strength; floors; footings; formwork (construction); foundations; foundation walls; hot weather construction; inspection; loads (forces); materials; mixing; mixture proportioning; placing; plain concrete; reinforced concrete; reinforcing steels; residential; serviceability; slab-on-ground; specifications; strength; structural analysis; structural concrete; structural design; sulfates exposure; walls; water; welded wire reinforcement.

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CHAPTER 1—GENERAL

1.1—Scope

1.1.1 This code, when legally adopted as part of a general building code, provides minimum requirements for design and construction of residential concrete elements. In areas without a legally adopted building code, this code defines minimum acceptable standards of design and construction practice.

R1.1.1 The design and construction requirements for footings, foundation walls, and slabs-on-ground are included in this code, together with requirements for concrete, reinforcement, forms, and other related materials.

1.1.2 This code supplements the general building code and governs matters pertaining to design and construction of cast-in-place concrete construction for one- and two-family dwellings and multiple single-family dwellings (townhouses), and their accessory structures, except wherever this code is in conflict with requirements in the legally adopted general building code.

1.1.3 This code shall govern in all matters pertaining to design, construction, and material properties where this code is in conflict with requirements contained in other standards referenced in this code.

1.1.4 This code is limited to design and construction of concrete footings, including thickened slab footings, wall footings, and isolated footings; concrete basement or foundation walls constructed with removable forms or with flat insulating concrete forms; and concrete slabs-on-ground.

R1.1.4 The design and construction requirements for footings, foundation walls, and slabs-on-ground are included in this code, together with requirements for concrete, reinforcement, forms, and other related materials.

1.1.5 This code does not govern design and construction of: insulating concrete form walls with a waffle or screen configuration; precast wall elements; above-grade concrete walls; deep foundation systems (such as piles, drilled piers, or caissons); post-tensioned slabs-on-ground; and elevated concrete slabs.

R1.1.5 Provisions for application of precast wall elements can be found in the 2003 International Residential Code (IRC) and other publications. The provisions for above-grade concrete walls are currently available in other industry references. Guidance on the requirements for post-tensioned slabs-on-ground can be found in the Post-Tensioning Institute’s “Design and Construction of Post-Tensioned Slabs-On-Ground.”

1.1.6 This code does not govern the design and application of systems for surface drainage, waterproofing, damp-proofing, and the ventilation of radon gases.

R1.1.6 Guidance on the type and application of systems for drainage, waterproofing, and damp-proofing, as well as for radon gas ventilation systems, are commonly found in the general building code.

1.2—Alternative systems

Sponsors of any system of design or construction or an alternative material to be applied 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 have authority to investigate the data so submitted, to require tests, and to 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.

R1.2 New methods of design, new materials, and new uses of materials should undergo a period of development before being specifically 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 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 document.

1.3—Footings and foundation walls

The design and construction of concrete footings and foundation walls shall be in accordance with the provisions of Chapters 6 and 7, respectively.

1.3.1 Seismic design—The seismic risk level of a region, or seismic performance or design category of a structure, shall