PART 3

Building Construction

Chapters 4 through 10

- **Chapter 4** Foundations
- **Chapter 5** Floors
- **Chapter 6** Wall Construction
- **Chapter 7** Wall Covering
- **Chapter 8** Roof-Ceiling Construction
  (No changes addressed.)
- **Chapter 9** Roof Assemblies
- **Chapter 10** Chimneys and Fireplaces
  (No changes addressed.)

Chapters 4 through 10 address the prescriptive methods for building foundations, floor construction, wall construction, wall coverings, roof construction, roof assemblies, chimneys, and fireplaces. Concrete, masonry, and wood foundations; retaining walls; supporting soil properties; surface drainage; and foundation dampproofing and drainage are found in Chapter 4. Chapters 5, 6, and 8 contain the construction provisions for floors and decks, walls, and roofs, respectively, with most of the provisions addressing light-frame construction. Chapter 7 addresses interior finishes, such as drywall and plaster installations, and exterior wall coverings, including water-resistive barriers, flashings, siding, and veneer, to provide a durable weather-resistant exterior. Chapter 9 covers the various waterproof roof assemblies, including roofing underlayment, roof eave ice barrier, flashings, asphalt shingles, and other roof coverings. Site-built masonry fireplaces and chimneys as well as prefabricated fireplaces and chimneys, including their weather-tight roof terminations, are addressed in the provisions of Chapter 10. ■

R401.4
Soil Tests

Figure R403.1(1)
Concrete Stem Walls

R403.1.2
Continuous Footings in SDC D

R502.11
Guard Post Attachment to Floor Framing

R506.2
Post-Tensioned Slabs

R506.3.3
Vapor Retarder

R507.5
Deck Beams

R507.5.1, R507.5.2
Deck Bearing and Connections

R507.9.1.3
Ledger to Band Joist Details

R507.9.1.5–R507.9.1.8
Ledger Flashing and Water-Resistive Barriers

Table R602.3(1)
Roof Framing Lumber Specific Gravity

R602.10.2.2
Braced Wall Panel Placement

R602.10.3
Wall Height

Table R602.10.5
Contributing Length of Braced Wall Panels

R602.10.6
Length of Portal Frame

R702.7
Responsive Vapor Retarders

R703.2
Water-Resistive Barrier (WRB)

R703.3.1, R703.3.4
Exterior Wall Coverings

R703.4
Flashing

R703.6.1
Furring Over WRBs for Wood Shakes and Shingles

R703.7.3
Water-Resistive Barriers for Stucco

R703.11, R703.14
Vinyl and Polypropylene Siding

R703.18
Fiber-Mat Reinforced Cementitious Backer Units

R704
Exterior Soffits and Fascia

R902.1
Roof Assemblies

R905.3.6, R905.5.6, R905.6.5
Wind Resistance—Clay, Concrete and Slate Roofs

R905.7, R905.8
Wood Shakes and Shingles

R905.9.4, R905.10.5, R905.11.4
Wind Resistance—Built-Up, Metal and Bitumen Roofing

R905.12, R905.13.4, R905.14.4
Single-Ply, Liquid-Applied and Sprayed Roofing

R905.15, R905.16
BIPV Roofs

R908.3
Roof Replacement

R909
Roof Coatings

R401.4
Soil Tests

CHANGE TYPE: Modification

CHANGE SUMMARY: For lots with poor soil, a geotechnical report is required to include the site class and S_{DS} in high seismic areas.

2024 CODE TEXT: **R401.4 Soil tests.** Where quantifiable data created by accepted soil science methodologies indicate expansive soils, compressible soils, shifting soils or other questionable soil characteristics are likely to be present, the building official shall determine whether to require a soil test to determine the soil's characteristics at a particular location. This test shall be done by an approved agency using an approved method. Where the seismic design category in accordance with Section R301.2.2.1 is C or greater and where soil testing is performed, the geotechnical report shall include the determination of the site class and the short-period spectral response acceleration, S_{DS}, in accordance with Section 1613 of the *International Building Code*. The seismic design category shall be assigned in accordance with Table R301.2.2.1.1.

CHANGE SIGNIFICANCE: Loading conditions beyond the normal live, dead, wind or earthquake loading generally include the types of loading caused by special regional conditions. Such conditions might include soil instability, forces generated on foundations by expansive soils, and increased lateral pressures due to a high-water table or surcharge loads (dead load from adjacent structures). Accounting for such conditions in the structure is beyond the scope of the *International Residential Code's* (IRC) methods of foundation construction. When these special issues exist, a soils test may be required to evaluate the existing conditions.

For typical soils without these issues—where the bearing capacity of the soil has not been determined by a soils test or additional testing such as borings, field load tests, laboratory tests and engineering analysis—the bearing values of IRC Table R401.4.1(1), Presumptive load-bearing values of foundation materials, are used for the design of the foundation system.

In some areas of the United States, soils in a lot require a soils test. *(Photo courtesy of Monty Rakusen/DigitalVision via Getty Images)*

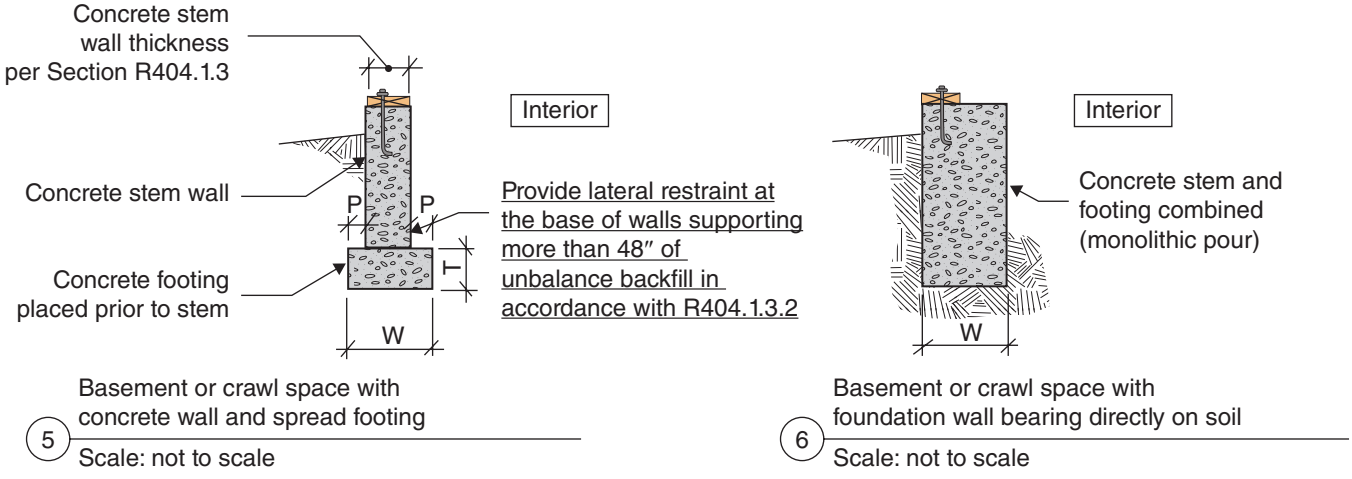
In the 2024 IRC—to match requirements in the seismic provisions of *International Building Code* (IBC) Section 1613 and ASCE 7, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*—sites with what the IRC describes as questionable soils trigger a site-specific response analysis to identify the applicable Site Class and Seismic Design Category. This is a complex analysis often requiring a specialized engineer. For consistency with the IBC and ASCE 7, the already required geotechnical investigation is expanded to include determination of the Site Class and short-period spectral response acceleration, S_{DS}. Providing this information ensures that the correct Seismic Design Category is assigned, resulting in the seismic performance intended by the IRC.

Figure R403.1(1)
Concrete Stem Walls

CHANGE TYPE: Modification

CHANGE SUMMARY: A requirement for a concrete slab in a basement or crawl space when supporting more than 4 feet of backfill is added. This primarily affects taller stem walls as concrete basement walls already require lateral support.

2024 CODE TEXT: **R403.1 General.** All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, crushed stone footings, wood foundations, or other approved structural systems that shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill. Concrete footings shall be designed and constructed in accordance with the provisions of Section R403 or in accordance with ACI 332.



W = width of footing, T = thickness of footing and P = projection per Section R403.1.1

FIGURE R403.1(1)—PLAIN CONCRETE FOOTINGS WITH MASONRY AND CONCRETE STEM WALLS IN SEISMIC DESIGN CATEGORIES A, B AND C—EXCERPT

CHANGE SIGNIFICANCE: The provisions of Section R403.1 include the general statement that a footing must be capable of supporting the required design loads. The section references the character of the soil and the minimum extension of the footing below the frost line. The code mandates that footings be supported on undisturbed natural soil or engineered fill.

All concrete and masonry basement wall tables assume the wall is laterally supported at the top and bottom (see Sections R404.1.1, Design required, and R404.1.3.2, Reinforcement for foundation walls). The bottom of a basement wall is traditionally braced by a concrete slab. Section R404.1.1 requires engineered design when permanent lateral support is not provided at the top or bottom of a foundation wall. Section R404.1.3.2 states that concrete foundation walls shall be laterally supported at the top and bottom. This means all basements require a slab at the bottom of the concrete wall. The top of the basement wall must be connected to the floor framing above.

For stem walls, the requirement to add lateral support at the bottom of the wall has not existed. In fact, to be a stem wall rather than a basement wall, the

Concrete stem walls supporting more than 4 feet of backfill must have a slab bracing the base of the wall.

wall is supported by a footing and there is traditionally no slab, only bare earth covered by a vapor barrier required by Section R408.3, Unvented crawl space, or Section N1102.2.10.1, Crawl space wall insulation installation. Alternatively, the vapor barrier is placed on the underside of the floor joists following Section R408.8, Under-floor vapor retarder, in some climate zones. No matter which section is used to protect framing from moisture, there is no slab requirement for a crawl space.

In the 2024 IRC, this change impacts taller concrete stem walls, typically found on a sloped foundation but placed at times below a large single-family dwelling. While typical stem walls are 30-48 inches tall, taller stem walls do occur. These concrete walls, when supporting more than 4 feet of backfill, will now require permanent lateral support at the base of the walls in the form of a concrete slab. Figure R403.1(1)—Plain Concrete Footings with Masonry and Concrete Stem Walls in Seismic Design Categories A, B and C—includes the requirements for stem wall construction in low-seismic regions. By referencing Section R404.1.3.2 in Figure R403.1(1) specifically for the base of a concrete stem wall with deep backfill, lateral support at the bottom of the concrete stem wall is now required.