

## Residential Footing and Foundation

This tip sheet reflects code requirements of the 2021 International Residential Code (IRC) with Washington State Amendments.

Please verify the following before calling for the footing or foundation inspection.

### Permits and Plans

- Job address shall be posted in a visible location. (R319.1)
- Permit and approved plans are on site and accessible to the inspector. (R105.7, R106.1.1, R106.3.1)
- Permit information is correct (e.g., address, permit number, description of work, etc.). (R106.1.1)
- Plans have been reviewed for any special inspection requirements. (R401.4, Soils Report)  
**Note:** If special inspections are required by the jurisdiction, have the special inspector leave copies of their site visit report(s) with the permit each time they are on the site. Make sure the special inspector is certified to perform the required type of inspection.
- Check the approved plans for identification of flood hazard area and associated requirements for construction. (R109.1.3, R322)
- Check the approved plans for building setback or height restrictions. (Per the local jurisdiction)

### Location on Property

- The footings and foundation are not located within the setbacks. (Per the local jurisdiction)
- Protected areas and erosion control measures that need to be maintained and/or protected are marked per the approved plans. (Per the local jurisdiction)

### Footings

- Provide a safe and clear walking path to the site and the formwork.
- The footings are constructed per the approved plans. (R403)
- The building width perpendicular to wall footing is greater than 32 feet, the footing width shall be increased by 2 inches and footing depth shall be 1 inch for every 4 feet of increase in building width. (R403.1 table Note. c)
- The building width perpendicular to the wall footing is less than 32 feet, a 2-inch decrease in footing width and 1-inch decrease in footing depth are permitted for every 4 feet of decrease in building width provided that the minimum width is 12 inches and minimum is 6 inches. (R403.1 table Note. d)

- Footing not less than 12 inches (305mm) in width and 6 inches (152mm) in depth. (R403.1.1)
- All loose soil, mud, or water is removed from the bottom of the footing. Debris, water, and/or ice has been removed from spaces to be occupied by concrete. (R403.1; ACI 332-08.5.2.4)
- Steel reinforcement is properly placed and the steel grade (40 or 60 are most common), size, spacing, splicing, and cover follow the approved plans. (R403.1.3.5.3)
- Minimum cover requirements are (ACI 318 20.6.1.1-.4):
  - 3 inches when cast against and permanently exposed to ground
  - 2 inches for number 6 through number 18 bar when exposed to earth or weather
  - 1-1/2 inches for number 5 or smaller bar when exposed to earth or weather
- Minimum diameter of bend 6 times the bar diameter. (ACI Table(s) 25.3.1 and 25.3.2)
- The reinforcement steel is spliced per the approved plans with two ties per lap. (R403.1.3.5.4)
- Footings for masonry chimneys are a minimum of 12 inches thick and extend not less than 6 inches outside the chimney wall and project below-grade as required. Reinforcement steel is per approved drawings. (R1001.2)
- Footings are level, or stepped, if the ground slopes more than 1 foot in 10 feet (10%). (R403.1.5)
- There is minimum 1 inch clear spacing between parallel reinforcing bars. (ACI 318 25.2.2)
- Footings project beyond the face of the foundation wall at least 2 inches, but not more than the thickness of the footing. (R403.1.1.)
- Footings do not bear on frozen soil. (R403.1.4.1)
- Reinforcement is thoroughly clean of loose scale, rust, ice, mud, oil or other deleterious coatings. (ACI 318)
- The placement of buildings structures on or adjacent to slopes steeper than 1 unit vertical in 3 units horizontal (33.3-percent slope) shall conform to section (R403.1.7.1 through R403.1.7.4.)

## Foundation

- Top of the wall will project a minimum of 6 inches above finished grade. (R404.1.6)
- Foundations in flood-prone areas (see IRC Table R301.2.4 and the local jurisdiction) shall be designed per IRC R322. The elevation shall be determined per FEMA maps and/or surveyed and sealed by a design professional. Flood resistant materials must be used. (R322.2.1, [Zone AO]).

- Surface drainage is away from the foundation walls a minimum of 6 inches for the first 10 feet. On narrow lots, provide the slope (a minimum of 2 percent) to drains or to approved swales. (R401.3, Exception.)
- The joists within the building footprint maintain a minimum 18 inches above grade in the crawl space or be treated wood or wood of natural resistance to decay. (R317.1)
- The beams within the building footprint maintain a minimum 12 inches above grade in the crawl space or are treated wood or wood of natural resistance to decay. (R317.1)
- Wood columns where closer than 8 inches (204mm) to exposed ground are to be treated wood or wood of natural resistance to decay. (R317.1)
- Wood columns in contact with basement floor slabs are to be treated wood or wood of natural resistance to decay, unless supported by concrete piers or metal pedestals projecting not less than 1 inch (25mm) above the concrete floor and separated from the concrete pier by an impervious moisture barrier. (R317.1)
- The foundation wall is at the thickness shown on the approved plans.
- Steel reinforcement is properly placed and the steel grade (40 or 60 are most common), size, spacing, splicing, and cover follow the approved plans. (R403.1.3.5.3)
- Minimum cover requirements are (ACI 318 20.6.1.1-.4):
  - 3 inches when cast against and permanently exposed to ground
  - 2 inches for number 6 through number 18 bar when exposed to earth or weather
  - 1-1/2 inches for number 5 or smaller bar when exposed to earth or weather
- Minimum diameter of bend 6 times the bar diameter. (ACI Table(s) 25.3.1 and 25.3.2)
- When the concrete is poured, the anchor bolts will have a minimum 7 inches of embedment, putting the bottom of anchor bolts within steel. (R403.1.6)
- Anchor bolts shall be permitted to be located while concrete is plastic and before it has set. Where anchor bolts resist placement or the consolidation of concrete around anchor bolts is impeded, the concrete shall be vibrated to ensure full contact between the anchor bolts and concrete. (R403.1.6)
- Anchor bolts are sized and spaced per the structural plans for shear walls.
- The required hold-downs are placed per approved plans and manufacturer's installation requirements.

**Note:** Hold-down straps and embedded bolts for hold-downs may not be wet set. Requirements may vary per jurisdiction.

- Crawl space vents incorporated into foundation walls are properly sized, spaced and installed. (R408)
- Walls exposed to weather are to have a minimum of 3000 psi concrete strength and air-entrained (5 percent to 7 percent). (IRC Table R402.2)
- Foundation retaining walls unsupported at the top and retaining greater than 48 inches of unbalanced fill shall be designed. (R404.4)
- Waterproofing and damp proofing of foundation exterior walls is required. (R406)

### Cold and Hot Weather Requirements

- Concrete being placed during freezing or near-freezing weather complies with the following (ACI 318 26.5.4):
  - Adequate equipment provided for heating concrete materials and protecting concrete during freezing or near-freezing weather.
  - Concrete materials and reinforcement, forms, fillers and ground with which concrete is to come in contact is free from frost.
  - Frozen materials or materials containing ice not being used.
- Concrete being placed during hot weather complies with the following (ACI 318 26.5.5):
  - Proper attention is given to ingredients, production methods, handling, placing, protection and curing to prevent excessive concrete temperatures or water evaporation that could impair the required strength or serviceability of the member or structure.