

# Shallow Wall Foundations (Thickened Edge)

(From International Code Council website)

## **Residential Only**

**R403.3 Frost protected shallow foundations.** For buildings where the monthly mean temperature of the building is maintained at a minimum of 64°F (18°C), footings are not required to extend below the frost line when protected from frost by insulation in accordance with Figure R403.3(1) and Table R403.3(1). Foundations protected from frost in accordance with Figure R403.3(1) and Table R403.3(1) shall not be used for unheated spaces such as porches, utility rooms, garages and carports, and shall not be attached to basements or crawl spaces that are not maintained at a minimum monthly mean temperature of 64°F (18°C).

Materials used below *grade* for the purpose of insulating footings against frost shall be *labeled* as complying with ASTM C 578.

**\*\*\*A Monolithic or Thickened Edge Slab Foundation is approved to use up to 1024' sq. Ft on an UN-HEATED STRUCTURE.\*\*\***

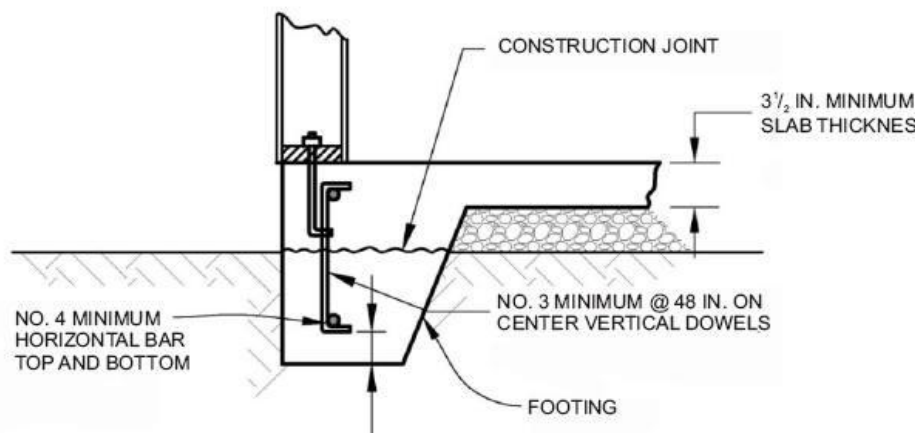
**\*\*\*Any square footage over 1024' on an UN-HEATED STRUCTURE must be engineered or Frost Walls must be used.\*\*\***

**R403.1.3.2 Slabs-on-ground with turned-down footings.** Slabs on ground with turned down footings shall have a minimum of one No. 4 bar at the top and the bottom of the footing.

**Exception:** For slabs-on-ground cast monolithically with the footing, locating one No. 5 bar or two No. 4 bars in the middle third of the footing depth shall be permitted as an alternative to placement at the footing top and bottom.

Where the slab is not cast monolithically with the footing, No. 3 or larger vertical dowels with standard hooks on each end shall be provided in accordance with Figure R403.1.3.2. Standard hooks shall comply with Section R611.5.4.5.

**FIGURE R403.1.3.2  
DOWELS FOR  
SLABS-ON-GROUND  
WITH  
TURNED-DOWN  
FOOTINGS (For SI: 1  
inch = 25.4mm)**



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**R403.1.4.1 Frost protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:**

1. Extended below the frost line specified in Table R301.2.(1);
2. Constructing in accordance with Section R403.3;
3. Constructing in accordance with ASCE 32; or
4. Erected on solid rock.

**Exceptions:**

1. Protection of freestanding *accessory structures* with an area of 600 square feet (56 m<sup>2</sup>) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
2. Protection of freestanding *accessory structures* with an area of 400 square feet (37 m<sup>2</sup>) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

**\*\*\*Footings shall not bear on frozen soil unless the frozen condition is permanent\*\*\***

**R403.3.1.1 Attachment to unheated slab-on-ground structure.** Vertical wall insulation and horizontal insulation of frost protected shallow foundations that adjoin a slab-on-ground foundation that does not have a monthly mean temperature maintained at a minimum of 64°F (18°C) shall be in accordance with Figure R403.3(3) and Table R403.3(1). Vertical wall insulation shall extend between the frost protected shallow foundation and the adjoining slab foundation. Required horizontal insulation shall be continuous under the adjoining slab foundation and through any foundation walls adjoining the frost protected shallow foundation. Where insulation passes through a foundation wall, it shall either be of a type complying with this section and having bearing capacity equal to or greater than the structural loads imposed by the building, or the building shall be designed and constructed using beams, lintels, cantilevers or other means of transferring building loads such that the structural loads of the building do not bear on the insulation.

**R403.3.1.2 Attachment to heated structure.** Where a frost protected shallow foundation abuts a structure that has a monthly mean temperature maintained at a minimum of 64°F (18°C), horizontal insulation and vertical wall insulation shall not be required between the frost protected shallow foundation and the adjoining structure. Where the frost protected shallow foundation abuts the heated structure, the horizontal insulation and vertical wall insulation shall extend along the adjoining

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foundation in accordance with Figure R403.3(4) a distance of not less than Dimension A in Table R403.3(1).

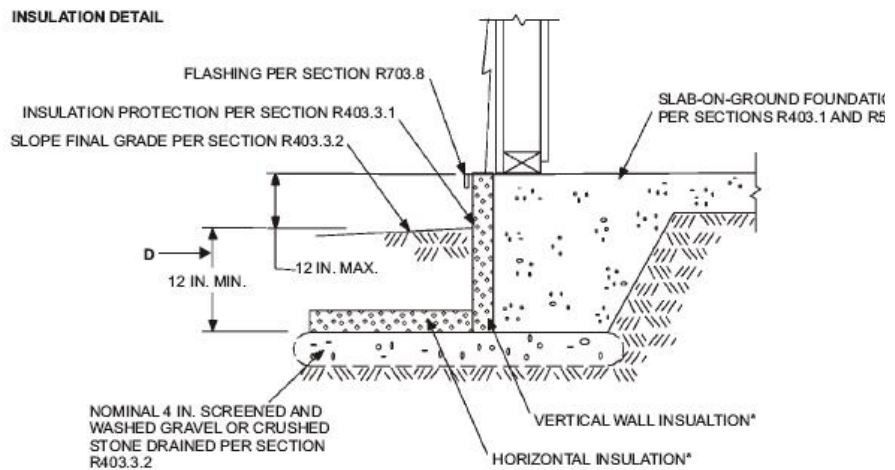
**Exception:** Where the frost protected shallow foundation abuts the heated structure to form an inside corner, vertical insulation extending along the adjoining foundation is not required.

**R403.3.2 Protection of horizontal insulation below ground.** Horizontal insulation placed less than 12 inches (305 mm) below the ground surface or that portion of horizontal insulation extending outward more than 24 inches (610 mm) from the foundation edge shall be protected against damage by use of a concrete slab or asphalt paving on the ground surface directly above the insulation or by cementitious board, plywood rated for below-ground use, or other *approved* materials placed below ground, directly above the top surface of the insulation.

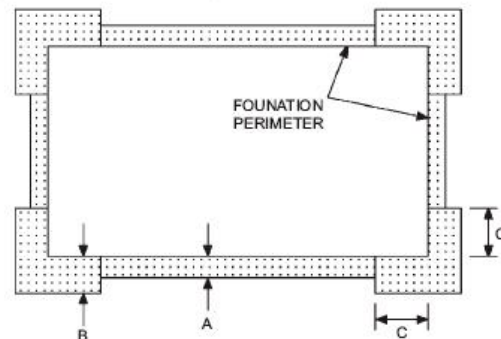
## **FIGURE R403.3(1) INSULATION PLACEMENT FOR FROST PROTECTED FOOTINGS IN HEATED BUILDINGS**

For SI: 1 inch = 25.4 mm

- See Table R403.3 (1) for required dimensions and R-values for vertical and horizontal and minimum footing depth



## HORIZONTAL INSULATION PLAN



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**TABLE R403.3(1)**  
**MINIMUM FOOTING DEPTH AND INSULATION REQUIREMENTS FOR**  
**FROST-PROTECTED FOOTINGS IN HEATED BUILDINGS<sup>a</sup>**

AIR FREEZING INDEX (°F-days) <sup>b</sup>	MINIMUM FOOTING DEPTH, D(inches)	VERTICAL INSULATION R-VALUE <sup>c, d</sup>	HORIZONTAL INSULATION R-VALUE <sup>c, e</sup>		HORIZONTAL INSULATION DIMENSIONS PER FIGURE R403.3(1) (inches)		
			Along walls	At corners	A	B	C
1,500 or less	12	4.5	Not required	Not required	Not required	Not required	Not required
2,000	14	5.6	Not required	Not required	Not required	Not required	Not required
2,500	16	6.7	1.7	4.9	12	24	40
3,000	16	7.8	6.5	8.6	12	24	40
3,500	16	9.0	8.0	11.2	24	30	60
4,000	16	10.1	10.5	13.1	24	36	60

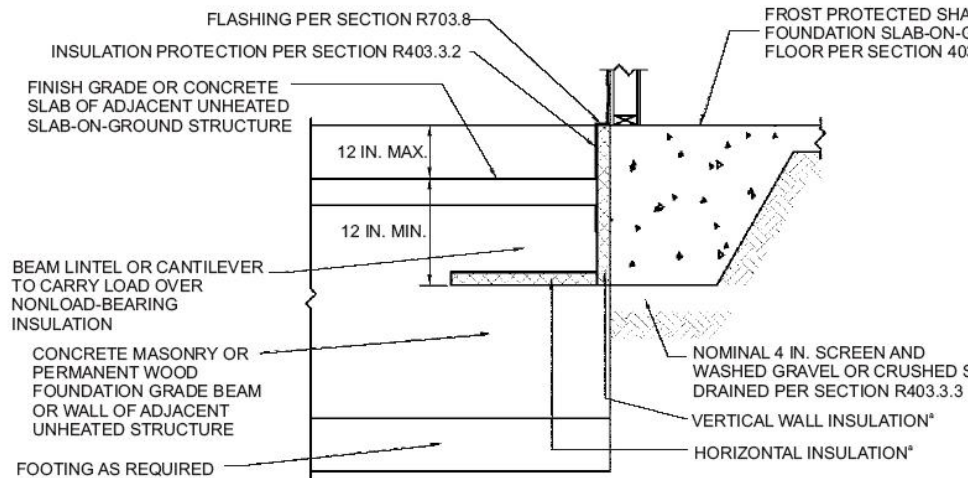
For SI : 1 inch - 25.4 mm, °C = [(°F)-32]/1.8.

- a. Insulation requirements are for protection against frost damage in heated buildings. Greater values may be required to meet energy conservation standards.
- b. See Figure R403.3(2) or Table R403.3(2) for Air Freezing Index values.
- c. Insulation materials shall provide the stated minimum *R*-values under long-term exposure to moist, below-ground conditions in freezing climates. The following *R*-values shall be used to determine insulation thicknesses required for this application: Type II expanded polystyrene-2.4*R* per inch; Type IV extruded polystyrene-4.5*R* per inch; Type VI extruded polystyrene-4.5*R* per inch; Type IX expanded polystyrene-3.2*R*per inch; Type X extruded polystyrene-4.5*R* per inch.
- d. Vertical insulation shall be expanded polystyrene insulation or extruded polystyrene insulation.
- e. Horizontal insulation shall be extruded polystyrene insulation.

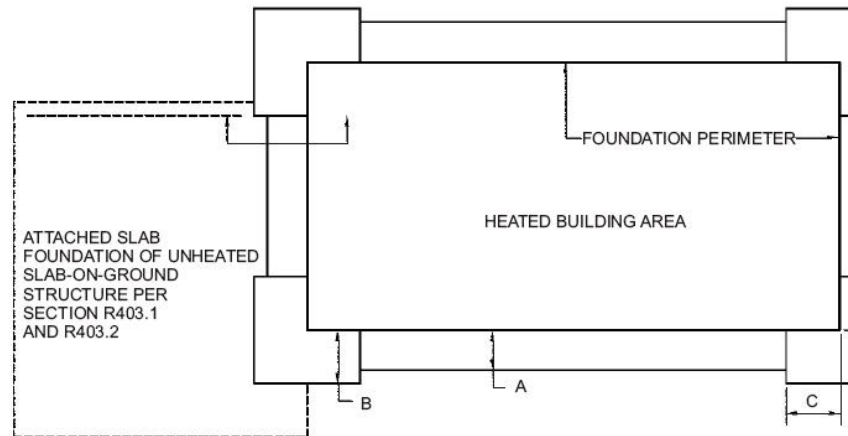
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**FIGURE R403.3(3) INSULATION DETAIL**  
**INSULATION**  
**PLACEMENT**  
**FOR**



**HORIZONTAL INSULATION PLAN**



## **FROST-PROTECTED FOOTINGS ADJACENT TO UNHEATED SLAB-ON-GROUND STRUCTURE**

For SI : 1 inch = 25.4 mm

- a. See Table R403.3(1) for required dimensions and R-values for vertical and horizontal insulation.

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**FIGURE R403.3(4)**  
**INSULATION PLACEMENT FOR FROST-PROTECTED FOOTINGS ADJACENT TO HEATED STRUCTURE**

