

Slab Edge Insulation

Last Updated: 03/14/2016

Scope



In cold climates, install slab edge insulation when pouring slab on grade foundations.

In cold climates, install slab edge insulation when constructing slab-on-grade foundations.

- Install insulation along the edge of the slab for a slab-on-grade foundation to meet or exceed the insulation R-value required by code.
- Install from the top of the slab down to the depth required by code.
- If the slab is poured separately from the exterior foundation wall and slab edge insulation is installed between the floor slab and the foundation wall, code permits that the top of the foam be cut at a 45-degree angle away from the exterior wall so that the upper edge is protected by concrete.

See the [Compliance Tab](#) for related codes and standards requirements, and criteria to meet national programs such as DOE's Zero Energy Ready Home program, ENERGY STAR Certified Homes, and Indoor airPLUS.

Description

Poorly or incorrectly insulated foundation slabs can present several problems for homes, including energy loss, moisture control issues, and indoor air quality challenges. Energy loss through slabs is primarily a result of heat conducted outward through the perimeter of the slab and into the surrounding soil. Moisture can become an issue inside the house if the relative temperature difference between the slab and indoor air temperatures become too great and condensation or high localized relative humidity issues occur. With condensation, mold may have a chance to grow and create indoor air quality issues. While it is common practice to install insulation, specifically rigid insulation, during the construction of the slab, it is often installed incorrectly or incompletely. However, by properly installing insulation that extends to the top of the slab in either a monolithic slab with a grade beam or a slab independent of the foundation design, thermal bridging, moisture, and air quality issues can all be addressed and minimized ([Ueno and Lstiburek 2012](#)).



Figure 1 - Properly installed rigid insulation. This image shows monolithic slab construction with properly installed rigid insulation that extends to the top of the slab and provides a complete thermal break. 

General Steps

To address the problems associated with thermal bridging and potential moisture issues that can occur with improperly insulated slab foundation systems, follow the steps below. The strategies for insulating the slab edge depend upon whether the slab on grade is:

1. Monolithic with a grade beam
2. Slabs independent of the foundation wall

For either design style it is important to review the plan for slab insulation with pest control and local building officials to ensure code compliance. Material selection is also important. Insulation levels should meet or exceed state requirements in accordance with the International Energy Conservation Code (IECC). Finally, only use insulation approved for below-grade use.



Figure 2 - Properly installed vapor barrier. The polyethylene vapor barrier shown above is properly positioned to work in conjunction with the rigid foam insulation that will be installed on the exterior of the slab after the wood forms have been removed. 

Monolithic with a Grade Beam

When the slab is monolithic with a grade beam, the insulation must be installed to the exterior of the slab edge/grade beam and continue vertically to the bottom of the grade beam as shown below. Different regions may have different code requirements, so be sure to check the local codes to make sure this meets the requirements. The insulation material must be appropriate for ground contact. XPS, rigid fiberglass, and rock wool are examples of acceptable materials. The exterior insulation will need to be protected from impact damage during construction and, subsequently, the above-grade portion must be protected from UV and impact damage ([BSC 2009](#)).

General steps for installation of slab insulation in monolithic with grade beam construction:

1. Install rigid insulation on the exterior that extends to the bottom of the grade beam.
2. Secure a protection board over the above-grade portion of the rigid insulation.
3. Make sure the protection board is of non-water sensitive material and coated to control absorption of water.
4. Install a protective membrane adhered to the slab and wrapped over the top of the insulation.
5. Ensure that insulation material is non-moisture sensitive and not subject to degradation with ground contact.

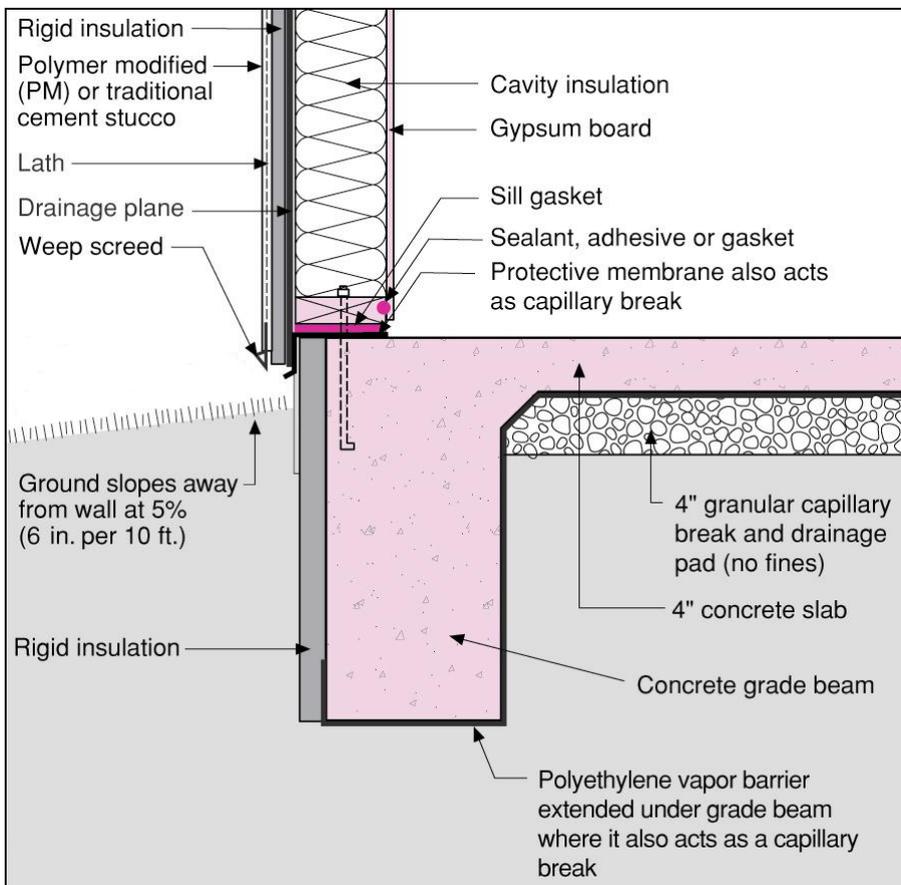


Figure 3 - Monolithic slab with a grade beam. The diagram above shows the monolithic slab with rigid insulation properly installed on the exterior of the slab and extending fully to the top of the concrete. 

Important notes if insulation is installed on the exterior of the slab ([DOE 2000](#)):

- Install the insulation from the top of the slab to the bottom of the frost line unless a termite inspection gap is required.
- Encapsulate or cover the exterior face of the insulation with a protective membrane to serve as a capillary break and to protect the insulation from termites.
- Cover the above-grade portion of the insulation exposed to outside air using a stucco coating, pressure-treated wood, brick, or aluminum flashing. When covering insulation, be conscious of how to detect termites in areas prone to termite infestation. Some states in termite-prone areas have addressed this issue by requiring a termite inspection gap near the top of the slab insulation.

Independent of the Foundation Wall

When the slab is independent from a perimeter foundation wall, insulation may be installed either on the exterior of the foundation wall or between the foundation wall and the slab. In order for the slab to be independent of the foundation wall, a bond break is needed between the slab, which is supported on grade, and the foundation wall that supports the exterior wall structure and its loads. Insulation at the vertical slab edge and under the slab perimeter provides this bond break. The graphic shows an example of a slab on grade that is structurally and thermally isolated from the perimeter foundation wall. Limiting factors on the width of the slab edge insulation in this situation are determined by the attachment of floor finishes and the width of the foundation wall needed to support the wall structure.

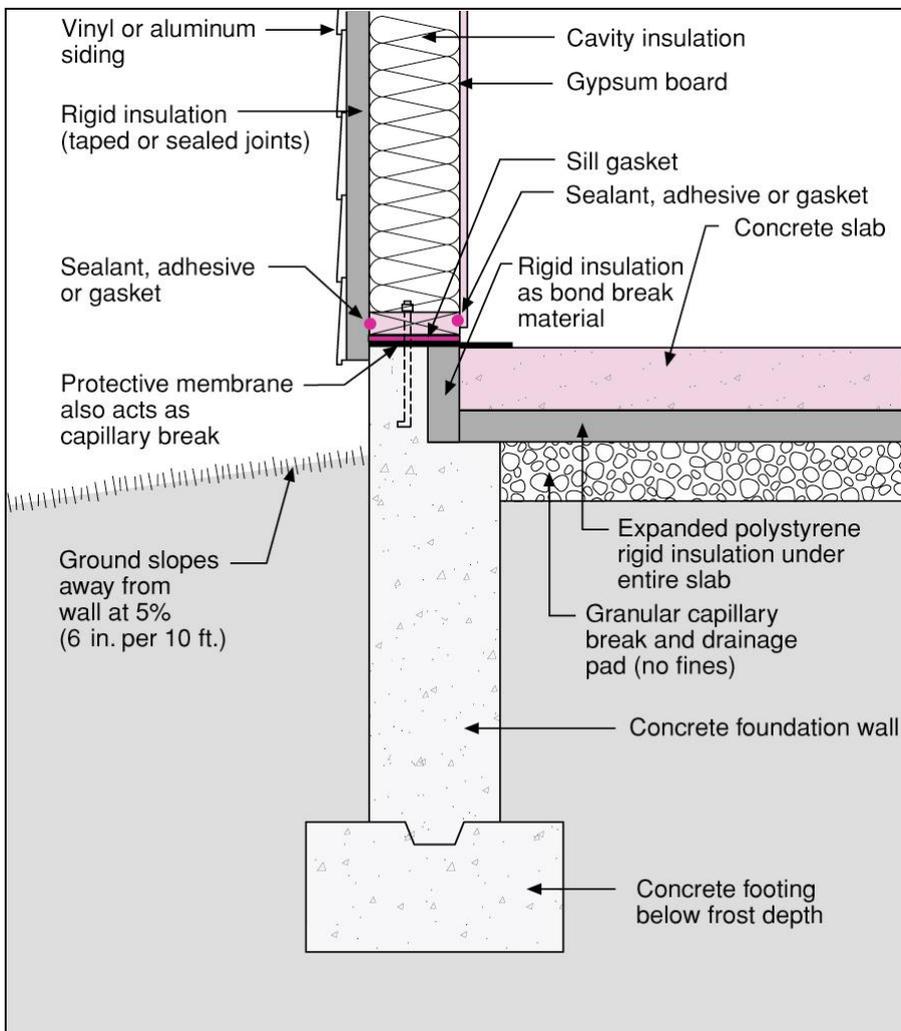


Figure 4 - Slab independent of foundation wall. The diagram above shows the proper placement of rigid insulation when the concrete slab is placed independent of the foundation wall. [i](#)

General steps for installation of slab insulation independent of the foundation wall:

1. Make sure the slab is insulated vertically at the edge and horizontally at the perimeter or under the entire slab.
2. Install the rigid insulation to provide a bond break between the slab and foundation wall.
3. Ensure the protective membrane is adhered to both the slab and top of foundation wall.

Whenever insulation is used in contact with ground or near ground, appropriate insect control measures must be used ([BSC 2009](#)).

Ensuring Success

A successful measurement of slab edge insulation is the temperature of the slab in relation to the air temperature. In the thermal image shown below, the air temperature was 71° F. A close match between slab temperature and air temperatures reveals that there is a minimal chance of slab condensation or high localized relative humidity issues.

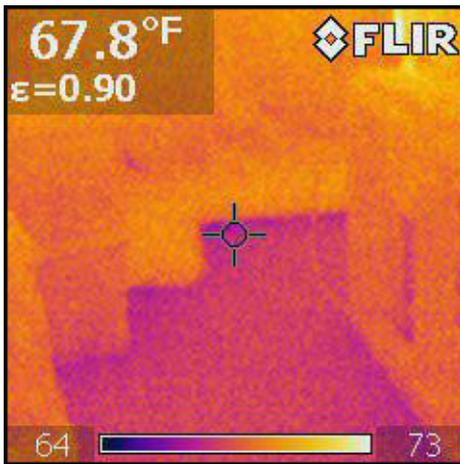


Figure 1 - Well-insulated slab. This thermal image shows the low relative temperature difference between the well-insulated slab and the air temperature. [REF icon](https://basc.pnnl.gov/sites/default/files/styles/large/public/images/REF_icon.png)

Climate

ENERGY STAR Version 3, (Rev. 07)

Thermal Enclosure Checklist, Reduced Thermal Bridging. For slabs on grade in CZ 4 and higher, 100% of slab edge insulated to \geq R-5 at the depth specified by the 2009 IECC and aligned with thermal boundary of the walls.

2009 IECC

Section 402.2.8, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs).

2009 IRC

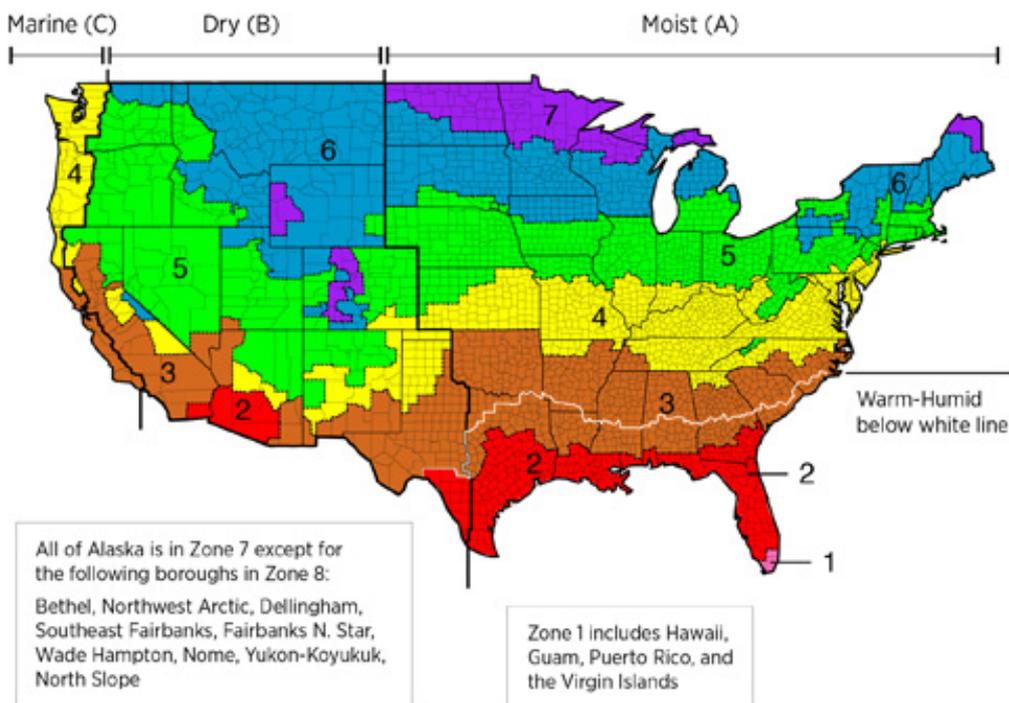
Section N1102.2.8, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs).*

2012 IECC

Section R402.2.9, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs).

2012 IRC

Section N1102.2.9, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs).



International Energy Conservation Code (IECC) Climate Regions

Training

Right and Wrong Images



Display Image: [ES_TESRC_4.2_PG90_154b_102811_0.jpg](#)

Reference: [Thermal Enclosure System Rater Checklist Guidebook](#)

Author(s): EPA

Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Thermal Enclosure System Rater Checklist.



Display Image: [ES_TESRC_4.2_PG90_154b_102811_0.jpg](#)

Reference: [Thermal Enclosure System Rater Checklist Guidebook](#)

Author(s): EPA

Organization(s): EPA

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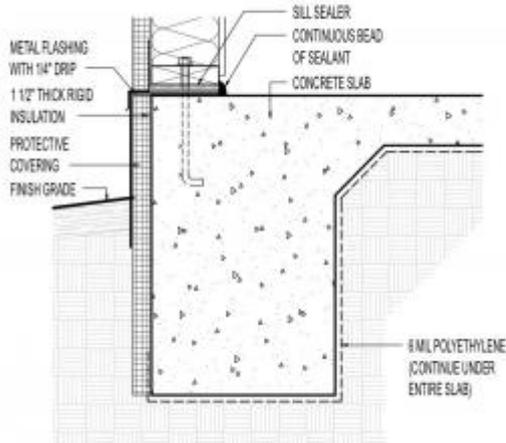
Reference: [Thermal Enclosure System Rater Checklist Guidebook](#)

Author(s): EPA

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Guide describing details that serve as a visual reference for each of the line items in the Thermal Enclosure System Rater Checklist.

CAD



CAD FILE: [42 CAD 1-4 slab 1-1-2-inch rigid foam 5-01003_GBA 1-31-12.dwg](#)

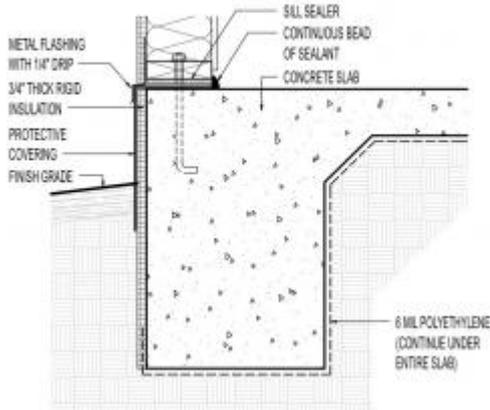
PDF: [42 CAD 1-4 slab 1-1-2-inch rigid foam 1-00004_GBA 1-31-12.pdf](#)

Reference: [Building Plans for Advanced Framing](#)

Author(s): Green Building Advisor

Organization(s): Green Building Advisor

Website providing CAD files and drawings of advanced framing details.



CAD FILE: [42 CAD 1-4 slab w 3-4-inch rigid foam 1-00001_1-31-12.dwg](#)

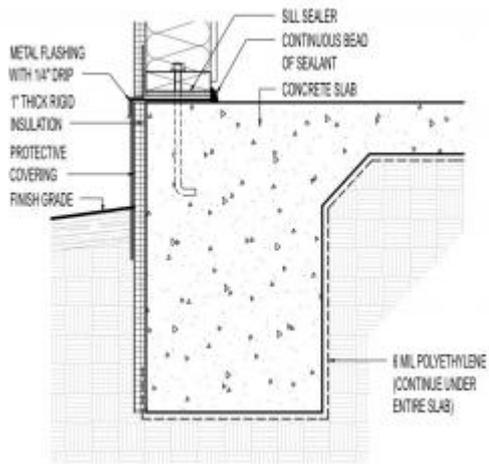
PDF: [42 CAD 1-4 slab w 3-4-inch rigid foam 1-00001_1-31-12.pdf](#)

Reference: [Building Plans for Advanced Framing](#)

Author(s): Green Building Advisor

Organization(s): Green Building Advisor

Website providing CAD files and drawings of advanced framing details.



CAD FILE: [41_CAD_slab_1-inch_rigid_foam_1-00002_GBA_1-31-12.dwg](#)

PDF: [42_CAD_slab_1-inch_rigid_foam_1-00002_GBA_1-31-12.pdf](#)

Reference: [Building Plans for Advanced Framing](#)

Author(s): Green Building Advisor

Organization(s): Green Building Advisor

Website providing CAD files and drawings of advanced framing details.

Compliance

The Compliance tab contains both program and code information. Exact code language is copyrighted and may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

[ENERGY STAR Certified Homes](#)

ENERGY STAR Certified Homes (Version 3/3.1, Revision 08), Rater Field Checklist

Thermal Enclosure System:

3. Reduced Thermal Bridging

3.2 For slabs on grade in CZ 4-8, 100% of slab edge insulated to ? R-5 at the depth specified by the 2009 IECC and aligned with the thermal boundary of the walls ^{13, 14}

Footnotes:

(13) Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. Alternatively, the thermal break is permitted to be created using ? R-3 rigid insulation on top of an existing slab (e.g., in a home undergoing a gut rehabilitation). In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).

(14) Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab. Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home's certification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: energystar.gov/slabedge.

ENERGY STAR Revision 08 requirements are required for homes permitted starting 07/01/2016.

[DOE Zero Energy Ready Home](#)

DOE Zero Energy Ready Home (Rev 05) Exhibit 1: Mandatory Requirements. Certified under ENERGY STAR Qualified Homes Version 3. Ceiling, wall, floor, and slab insulation shall meet or exceed 2012 IECC levels and achieve Grade 1 installation, per RESNET standards.

[2009 IECC](#)

Section 402.2.8, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs). The insulation must extend downward from the top of the slab on the inside or outside of the foundation wall. If located below grade, the insulation must extend the distance required by any combination of insulation installed vertically, under the slab or extending out from the building. If extending away from the building, the insulation must be protected by pavement or at least 10 inches of soil. The IECC doesn't require slab edge insulation in locations deemed under very heavy termite infestation by the code official.*

[2009 IRC](#)

Section N1102.2.8, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs). The insulation must extend downward from the top of the slab on the inside or outside of the foundation wall. If located below grade, the insulation must extend the distance required by any combination of insulation installed vertically, under the slab or extending out from the building. If extending away from the building, the insulation must be protected by pavement or at least 10 inches of soil. The IECC doesn't require slab edge insulation in locations deemed under very heavy termite infestation by the code official.*

[2012 IECC](#)

Section R402.2.9, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs). The insulation must extend downward from the top of the slab on the inside or outside of the foundation wall. If located below grade, the insulation must extend the distance required by any combination of insulation installed vertically, under the slab or extending out from the building. If extending away from the building, the insulation must be protected by pavement or at least 10 inches of soil. The IECC doesn't require slab edge insulation in locations deemed under very heavy termite infestation by the code official.*

[2012 IRC](#)

Section N1102.2.9, Slab-on-grade floors. Slab insulation requirements: CZ 1-3: R-0; CZ 4-5: R-10, 2 ft; CZ 6-8: R-10, 4 ft. R-5 must be added to the requirement for heated slabs. The insulation depth is to the depth of the footing or 2 feet, whichever is less in Climate Zones 1-3 (for heated slabs). The insulation must extend downward from the top of the slab on the inside or outside of the foundation wall. If located below grade, the insulation must extend the distance required by any combination of insulation installed vertically, under the slab or extending out from the building. If extending away from the building, the insulation must be protected by pavement or at least 10 inches of soil. The IECC doesn't require slab edge insulation in locations deemed under very heavy termite infestation by the code official.*

*Due to copyright restrictions, exact code text is not provided. For specific code text, refer to the applicable code.

Slab-on-Grade Insulation - Code Compliance Brief

Overview:

The intent of this brief is to provide code-specific information about slab-on-grade insulation to help ensure that the measure will be accepted as being in compliance with the code. Providing notes for codes officials on how to plan review and conduct field inspections can help builders or remodelers with proposed designs and installations and provide jurisdictional officials with information for acceptance. Providing the same information to all interested parties (e.g., code officials, builders, designers, etc.) is expected to result in increased compliance and fewer innovations being questioned at the time of plan review and/or field inspection.

Slabs lose energy primarily as a result of heat conducted outward and through the perimeter of the slab. Installing slab insulation around the perimeter of the slab will reduce heat loss and make the slab easier to heat. According to DOE's Building Energy Codes Program Helpdesk,¹ slab-on-grade insulation has been one of the more commonly addressed topics on code compliance for the past several years. Even though the requirements have essentially remained the same in the International Energy Conservation Code (IECC) and International Residential Code (IRC) versions 2009, 2012, and 2015, commonly asked questions continue to be asked about placement of insulation, depth of insulation, the thermal break between conditioned and unconditioned spaces, and additions or retrofits to existing homes. This brief provides an overview of slab-on-grade insulation requirements, insulation protection, and flashing.

Plan Review:

Per the **IECC/IRC, Section R103.3/R106.3 Examination of Documents**. The code official/building official must examine or cause to be examined construction documents for code compliance.

This section lists applicable code requirements and details helpful for plan review regarding the provisions to meet the requirement for slab-on-grade insulation.

- **Construction Documentation.** Review the construction documents for the details describing slab insulation installation and construction techniques.²

—**2015 IECC/IRC, Section R103.2/N1101.5 Information on Construction Documents.** Construction documents should include information about the insulation material and the R-value.
- **Insulation. 2015 IECC/IRC Section R402.2.10/N1102.2.10 Slab-On-Grade Floors.** Slab-on-grade floors with a floor surface less than 12 inches below grade should be insulated in accordance with information provided in the Insulation and Fenestration Requirements by Component Table, which is reproduced following this paragraph. Slab-on-grade insulation should extend downward from the top of the slab on either the outside or inside of the foundation wall. When a slab is independent from a perimeter foundation wall, insulation may be installed either on the exterior of the foundation wall or between the foundation wall and the slab. Insulation located below grade, as required in Climate Zones 4 through 8, should extend the length specified in the table by any combination of vertical insulation, insulation extending under the slab, or insulation extending out perpendicular to the building. Insulation extending perpendicular away from the building should be protected by pavement or by not less than 10 inches of soil. It is permissible by the codes that the top edge of insulation installed between the exterior wall and the edge of the interior slab be permitted to be cut at a 45-degree angle away from the exterior wall. Slab edge insulation is not required in jurisdictions designated by the code official as having a heavy termite infestation. Slab-on-grade insulation requirements for the 2012 and 2009 versions of the IRC/IECC are found in the following sections:

- 2012 IECC/IRC Section R402.2.9/N1102.2.9, Slab-on-grade floors
 - 2009 IECC/IRC Section 402.2.8/N1102.2.8, Slab-on-grade floors

Excerpt from the Insulation and Fenestration Requirements by Component

Table R402.1.2/N1101.1.2 (2015 IECC/IRC).

Climate Zone	1	2	3	4	5	6	7	8
Slab R-Value	R-5	R-5	R-5	R-5	R-5	R-5	R-5	R-5
Depth	NA	NA	NA	2 ft	2 ft	4 ft	4 ft	4 ft

Insulation to R-5 should be achieved except to the required slab edge R-values for heated slabs. For heated slabs in Climate Zones 1 through 3, install the insulation to a depth of the footing or to 2 feet, whichever is less. A heated slab is a type of construction that has a slab-on-grade concrete floor with a heating system embedded in or beneath the slab floor. Building additions that include a slab-on-grade construction also are subject to the slab edge requirements listed in the IECC/IRC.

- 2015 IECC/IRC, Section R402.2.10/N1102.2.10
 - 2012 IECC/IRC, Section R402.2.9/ N1102.2.9
 - 2009 IECC/IRC, Section 402.2.8/ N1102.2.8
- Insulation Protection.** Confirm that the construction documents specify proper insulation protection if applicable. Rigid foam board is typically used for insulating slabs.

—2015 IRC, Section R403.3.2, **Protection of Horizontal Insulation below Ground.** Horizontal insulation placed less than 12 inches below the ground surface or that portion of horizontal insulation extending outward more than 24 inches from the foundation edge should 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 acceptable materials, approved by the code official, placed below ground directly above the top surface.
- Flashing.** Confirm that the construction documents specify the proper location for installing flashing and flashing material.

—2015 IRC, Section R703.8.5 **Flashing.** Flashing should be located beneath the first course of masonry above the finished ground level, above the foundation wall or slab, and at other points of support including structural floors.

 - Section R703.4 Flashing. Approved corrosion resistant flashing should be applied in shingle fashion to prevent entry of water into the wall cavity or penetration of water to the building structural framing components.

Field Inspection:

Per the 2015 IECC, Section R104, Inspections, construction or work for which a permit is required is subject to inspection. Construction or work is to remain accessible and exposed for inspection purposes until approved. Required inspections include footing and foundation, framing and rough-in work, plumbing rough-in, mechanical rough-in, and final inspection.

Per the 2015 IRC, Section R109, Inspections, the wording is somewhat different in that for onsite construction, from time to time the building official, upon notification from the permit holder or his agent, can make or cause to be made any necessary inspections. Further details are provided for inspections regarding foundation, plumbing, mechanical, gas and electrical, floodplain, frame and masonry, and final inspection. Any additional inspections are at the discretion of the building official.

This section provides details for inspecting to the specific provisions for slab-on-grade insulation where one or more specific type of inspection per the IECC or IRC may be necessary to confirm compliance. Verifying code compliance for slab-on-grade insulation would be at the foundation inspection.

- Confirm that the insulation material meets ratings approved on the construction documents.
- Confirm that insulation has been installed properly so the insulation coverage is continuous and complete. The following websites provide information on slab insulation installation.
 - Guide with pictures on what materials to use and how to properly install slab edge insulation: <https://basc.pnnl.gov/resource-guides/slab-edge-insulation#block-views-guide-static-blocks-block-1> and <https://basc.pnnl.gov/resource-guides/slab-edge-insulation#block-views-guide-static-blocks-block-2>
 - Guide with pictures on how NOT to install <https://basc.pnnl.gov/resource-guides/window-and-door-rough-openings#block-views-guide-static-blocks-block-1>
- Confirm that proper insulation protection has been installed, if applicable, per approved construction documents.
- Confirm that proper flashing has been installed, if applicable, per approved construction documents.

Technical Validation(s):

This section provides additional information and helpful resources.

- *Case Study: Exterior Rigid Foam Insulation at the Edge of Slab Foundation, Fresno, California (2013):*
http://energy.gov/sites/prod/files/2013/11/f5/case_study_exterior_rigid_foam.pdf
Author: IBACOS
Publication Date: October 2013
- Guide for Slab Edge Insulation: <https://basc.pnnl.gov/resource-guides/slab-edge-insulation>
- *Measure Guideline: Hybrid Foundation Insulation Retrofits (2012):*
http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/measure_guide_hybrid_found.pdf
Author: Building Science Center
Publication Date: May 2012
- *Slab Edge Insulation for All Climates, Information Sheet 513:*
http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/slab_edge_insulation.pdf
- *Technology Fact Sheet Slab Insulation: Improve Comfort and Save Energy in Homes with Slab-on-Grade Floors,*
http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/29237.pdf
- *Thermal Enclosure System Rater Checklist,*
http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Thermal_Enclosure_System_Rater_Checklist_Guide6bce

More Info.

Access to some references may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

Case Studies

None Available

References and Resources*

1. [DOE Zero Energy Ready Home National Program Requirements](#)
Author(s): DOE
Organization(s): DOE
Publication Date: August, 2015
Standard requirements for DOE's Zero Energy Ready Home national program certification.
2. [ENERGY STAR Certified Homes, Version 3 \(Rev. 08\) National Program Requirements](#)
Author(s): EPA
Organization(s): EPA
Publication Date: September, 2015
Document outlining the program requirements for ENERGY STAR Certified Homes, Version 3 (Rev. 08).
3. [Measure Guideline: Hybrid Foundation Insulation Retrofits](#)
Author(s): Ueno, Lstiburek
Organization(s): BSC
Publication Date: May, 2012
Document providing information on basement insulation, air sealing and water management retrofits.
4. [Slab Edge Insulation for All Climates, Information Sheet 513](#)
Author(s): BSC
Organization(s): BSC
Publication Date: May, 2009
Information sheet about insulating slabs.
5. [Technology Fact Sheet Slab Insulation: Improve Comfort and Save Energy in Homes with Slab-on-Grade Floors](#)
Author(s): Southface Energy Institute
Organization(s): DOE
Publication Date: December, 2000
Brochure describing insulation approaches for homes with slab-on-grade floors.
6. [Thermal Enclosure System Rater Checklist Guidebook](#)
Author(s): EPA
Organization(s): EPA
Publication Date: October, 2011
Guide describing details that serve as a visual reference for each of the line items in the Thermal Enclosure System Rater Checklist.

*Publication dates are shown for formal documents. Dates are not shown for non-dated media. Access dates for referenced, non-dated media, such as web sites, are shown in the measure guide text.

Contributors to this Guide

The following Building America Teams contributed to the content in this Guide.

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