

How to Insulate the Perimeter of Slab-on-Grade Floors for Code Compliance

When preparing details for the installation of insulation for slab-on-grade floors it's all about location, location, location. The energy code requires insulation at the perimeter of slab-on grade floors because a large portion of the total heat loss from a concrete slab-on-grade floor occurs at the perimeter edges. Concrete is an excellent conductor of heat and proper detailing of the location of insulation around the perimeter of the slab edge is necessary to provide a thermal break that greatly reduces heat loss and gain through the concrete floor.

Section C402.2.4.1 of the 2021 edition of the Virginia Energy Conservation Code provides the following direction for the installation of insulation for slab-on-grade floors:

“Where installed, the perimeter insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The perimeter insulation shall extend downward from the top of the slab for the minimum distance shown in the table (i.e. 24” for unheated slab-on-grade floors) or to the top of the footing, whichever is less, or downward to not less than the bottom of the slab and then horizontally to the interior or exterior for the total distance shown in the table. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches of soil.”

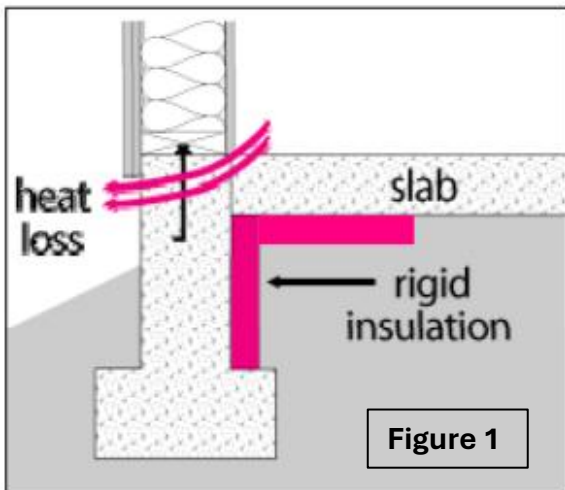


Figure 1 shows a common way of detailing the installation of insulation for unheated slab-on-grade floors that is not code compliant.

The issue with this figure is that the insulation does not extend downward from the top of the slab as required by code and does not provide a thermal break at the perimeter of the slab-on-grade floor.

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Also in this issue:

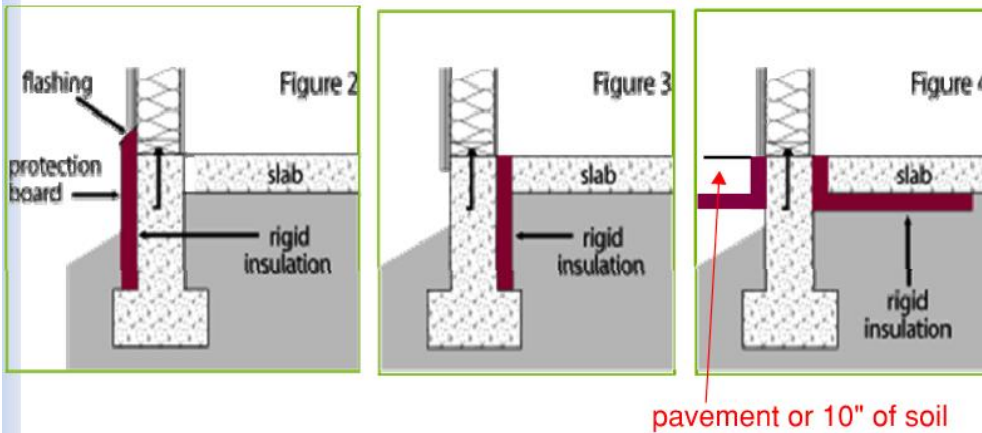
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Figures 2, 3, and 4 show how to insulate the perimeter of unheated slab-on-grade floors for code compliance.



The figures above comply with energy code requirements because insulation is shown on the outside of the foundation or on the inside of the foundation wall, the insulation extends downward from the top of the slab to the top of the footing, or extends horizontally to the interior or exterior of the building.

The following are some additional items related to code requirements and considerations for insulation for slab-on-grade floors.

Where the slab-on-grade floor is greater than 24 inches below the finished exterior grade, perimeter insulation is not required, *ref VECC, C402.2.4.1 exception*.

Insulation for unheated slab-on-grade floors is not required for commercial buildings or portions of commercial buildings located in Climate Zone 3 and enclosing occupancies other than Group R, *ref VECC, Table C402.1.3*.

Insulation applied to the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering on the exposed exterior insulation to prevent the degradation of the insulation's thermal performance, *ref VECC, C303.2.1*.

Heated slab-on-grade floors require insulation at the perimeter of the slab and full, under-slab insulation, *ref VECC, Table C402.1.3*.

It's very important to coordinate the architectural detailing of the insulation and finishes for slab-on-grade floors with the structural foundation details to avoid possible conflicts during construction.



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DEB Newsletter

#88 Spring 2026

Contact Us

1100 Bank Street, 6th Floor

Richmond, VA 23219

Phone: 804-786-3581

Fax: 804-225-4709

Email:

CapOut@dgs.virginia.gov

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Permit Revisions



Keeping up with permit revisions can be a challenge. Changing a door swing, moving a sprinkler head or modifying a toilet partition dimension during the construction phase may seem like innocuous changes, but all of these changes to the Approved Permit Documents could potentially require submission to DEB for review and approval as a Permit Revision. Submitting Permit Revision documents in a timely manner for DEB review and approval is critical for a successful project.

Prior to being incorporated into the work, changes to the permitted work must be documented and receive approval from DEB (CPSM 4.1.2.4) if the changes affect Virginia Uniform Statewide Building Code (VUSBC) and/or ADA90-Title II compliance. Often during construction inspections, DEB observes work constructed that differs from the Approved Permit Documents. This has led to delays while DEB attempts to unravel the issues and review the changes. In some instances, work must be demolished because it is non-compliant. The goal of timely review and approval of Permit Revisions is to avoid project delays and other legal and financial repercussions, and to ensure that the end result is both code compliant and accessible.

Because proposed changes may affect code compliance or accessibility, it is recommended (especially on larger and more complex projects) that a list of Requests for Information (RFIs), change orders in development and other means the project utilizes to document questions and potential changes are emailed to capout@dgs.virginia.gov for DEB review (CPSM 7.6.10) each month. DEB will review the submitted list and determine whether Permit Revision documents are required to be submitted for review and approval.

A recent example of a potential change to the Approved Permit Documents that did require submission of Permit Revision documents for DEB review and approval:

Please confirm it is acceptable to provide 2-Hour Rating to only the structural members of the 2-Hour Rated exhaust duct (I.E. joists or beams supporting the duct). This does not include the steel roof deck because it does not provide support for the 2-Hour Rated exhaust duct. Please see attached UL Design P-741 which was submitted and approved for this area. Highlighted in yellow is the 1-hour thickness row along with the 2-hour thickness row showing the required increase in applied fireproofing thickness. Beams differ in fireproofing thickness depending on their size, so the P-741 Beam Thickness table is included as well to show the required 1 and 2-Hour thicknesses where the threaded rod touches a beam instead of a joist. If acceptable, please revise ASI No. 33 to reflect the proposed UL P-741 2-Hour Rating for Exhaust Duct Supports.

Items that meet the criteria for Permit Revision will require the AE to submit the revised plan sheets and/or specification sections that are clouded to indicate the changes and sealed, signed and dated by the responsible design professional. Also required is a narrative letter that details the exact scope of the work that was removed, added or changed.

These items will be reviewed and, if compliant, approved by DEB. Upon notification of approval the Agency shall upload the Permit Revision Documents (identified as a ZR) to BITS. These electronic documents will be stamped and signed by the State Building Official and will be distributed to the Agency and State Fire Marshal via BITS using Form CO-17APR which has links to the Approved Permit Revision documents for download.

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| | COMMONWEALTH OF VIRGINIA DEPARTMENT OF GENERAL SERVICES CO-17 APR, Approved Permit Revision | Issued: 12/19/2025 Form Status: APPROVED |
| | PROJECT 799-18288-003 | |
| Project: | RENOVATE MARION CORRECTIONAL CENTER | |
| Sub-Project: | FINLEY GAYLE BUILDING RENOVATION | |
| Agency: | Marion Correction Treatment Center | |
| Agency Contact: | April Helbert | Phone: 540-266-2849 E-Mail: April.Helbert@vadoc.virginia.gov |
| Building: | FINLEY GAYLE | |
| Documents | | |
| Documents: | REVISED PLANS AE-117, AE-401, & AE-501 on 12/10/2025 | |
| BUILDING OFFICIAL ACTION | | |
| Electronic documents are available in BITS (an internal electronic document repository) for download (and printing if desired) by the agency by clicking the links within the original building permit and subsequent Approved Building Permit Revisions. The links will remain active until project completion. This information shall be readily available on the jobsite. | | |
| Approved: | Mike Coppa, for the Director of Division of Eng. & Bldgs. | |

Permit Revision documents signed by the State Building Official shall be incorporated into the work, and the Agency shall ensure these changes become a part of the Contract Documents. The Project Inspector shall maintain record copies of all Permit Revision documents signed by the State Building Official.

In summary, at the initiation of a project the Agency, AE and DEB should coordinate how the process of sharing potential Permit Revisions will be incorporated into the workflow. Getting in front of Permit Revisions will make for a more successful project delivery and avoid unwanted delays and costs.



Fred S. Kirby, PE Retires

State Review Civil/Structural Engineer Fred Kirby enters his retirement this month. He began his career with the Commonwealth on November 10, 1998, bringing extensive experience from his roles as a structural engineer for McKinney & Company and a drafter and engineering designer for St. Claire, Callaway, & Frye.

During his time at DEB, Fred worked on a wide variety of projects and is proud to have served a crucial role in many notable and challenging undertakings. Among his favorites is the renovation of Richmond's Old City Hall, a distinguished building with 1890's architecture that has fascinated him

since childhood. He also remembers a VDOT project that led him down a 7-foot-tall ventilation duct running beneath the roadway of the Hampton Roads tunnel, a trip that required temporarily stopping some incredibly large ventilation fans, leaving the DEB team to enjoy the roar of the traffic above them. Fred also contributed to the construction of the new General Assembly Building, a project that required building two separate pedestrian tunnels, one under 9th Street and a second that was proposed and designed after the building structure was in place. That second tunnel now connects the GAB to the visitors' tunnel just south of the Capitol Building - a very challenging part of an enduring project that now serves the legislators and general public.

In addition to his work responsibilities, Fred also devoted time with Virginia Blood Services coordinating donations for their drives on the Capitol grounds, a cause DGS always supported by allowing him time to distribute posters and recruit donors.

Looking to the future, Fred expects to spend more time with his wife, Yen, babysitting Jude, his 21-month-old grandson. He hopes to take fitness classes at the YMCA, take his favorite bike trip along the Capitol Trail to Upper Shirley Vineyards more frequently, spend more time kayaking, and maybe even take up jiu jitsu. Fred's an active guy, certain to make the most of his retirement – we wish him all the best!



VCCO Certifications

The following individuals recently passed the Virginia Construction Contracting Officer (VCCO) certification examination:

- **Paul Ely**, Radford University
- **Michelle Morgan**, Department of Conservation and Recreation

Virginia Construction Contracting Officers are state and local government employees who have completed the necessary training and successfully passed a multi-part examination focused on state procurement law, policy and procedures. VCCOs perform several key functions in delivering projects including the procurement of professional services; the receipt, opening and review of bids; and in some cases the approval of CO-8 forms for recommending the award of construction contracts.



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Building Permits and Approved Permit Documents 101

On Wednesday, May 27, at 11am DEB is offering a webinar open to all interested parties. The session will run for one hour and demonstrate the following:

- ✓ Exploring the information presented on a COV Building Permit
- ✓ Reviewing the typical Building Official Action wording, including the language stating when DEB construction inspections are required
- ✓ Finding the links to download Permit Documents approved by the State Building Official
- ✓ Creating a new CO-17 Building Permit for Construction
- ✓ Extending a Building Permit

There is no cost to attend this webinar. Time will be provided at the end of the training to address general questions from the audience regarding building permits issued by DEB.

Registration is limited to the first 100 people to sign up. Click [here](#) to register.

