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Slab Insulation Tricks To Improve Home Performance

Quick Facts

- + Insulated slabs boast many benefits such as reduced heat transfer, better HERS scores, energy cost savings, and larger utility incentives
- + Stem Wall Slab insulation has many advantages and can work well with various types of facades
- + Among many other benefits, having insulation on the exterior exposed edge of a Monolithic Slab helps fortify the moisture barrier which rarely gets fully wrapped around the footing

👤 Emil de Jong 📍 Matt Dovenbarger 📅 June 14, 2019 🏠 Building Science

When we think of a home's insulation, most of us think of walls, floors, and ceilings but, depending on climate, heat loss and gains through uninsulated slabs can make up a significant portion of a home's heating and cooling load. The degree to which slabs can be insulated varies widely and so do the energy savings associated with it. Investing the time and money in properly insulating a home's slab results in many benefits including: improved comfort, better moisture control, fewer warranty calls, lower utility costs, and better HERS scores! Here are a few techniques to help you capture more value.

[Access the Free Guide to Slab Insulation Techniques.](#)

Understanding the Benefits of Insulated Slabs

In order to understand why and how to maximize the benefits of insulated slabs, we need to understand how climate and temperature come into play. Ground temperature is fairly stable between 40 to 60 degrees fahrenheit depending on climate and season. These temperatures are not what most of us would set our thermostats at, but they are not too extreme either. Ambient temperatures, aka outside air temperature variations, is where it gets tricky.

Here in the southeast we frequently see temperatures below freezing in the winter and above 90 degrees Fahrenheit in the summer. The greater the temperature difference between the inside and the outside of a home, the quicker heat transfers through a slab. Concrete has the ability to hold or store heat, but it is also more conductive than other building materials such as wood. An uninsulated slab edge will remove heat, or allow heat to enter the home via conduction throughout the year. As a result, priority should be given to insulating exposed slab edges. Best practice for slab insulation depends on the type of slab, and other environmental conditions. This guide will cover the two most common types of slabs and frequent challenges.

Stem Wall Slab Insulation

When building a home, conditions such as climate and soil quality will likely determine which type of slab you build on. Generally stem wall slabs offer more advantages when it comes to insulating the slab edge. The primary advantage is that the insulation can be placed on the inside edge of the stem wall which offers complete protection from construction and home care activities.

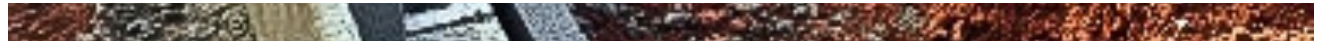
Other advantages of stem wall slabs include:

- 👍 Easy to insulate slab edge adjacent to the garage
- 👍 Works well with various types of facades
- 👍 Seamless transition to underslab insulation which can offer additional benefits and may be required by code in certain climates

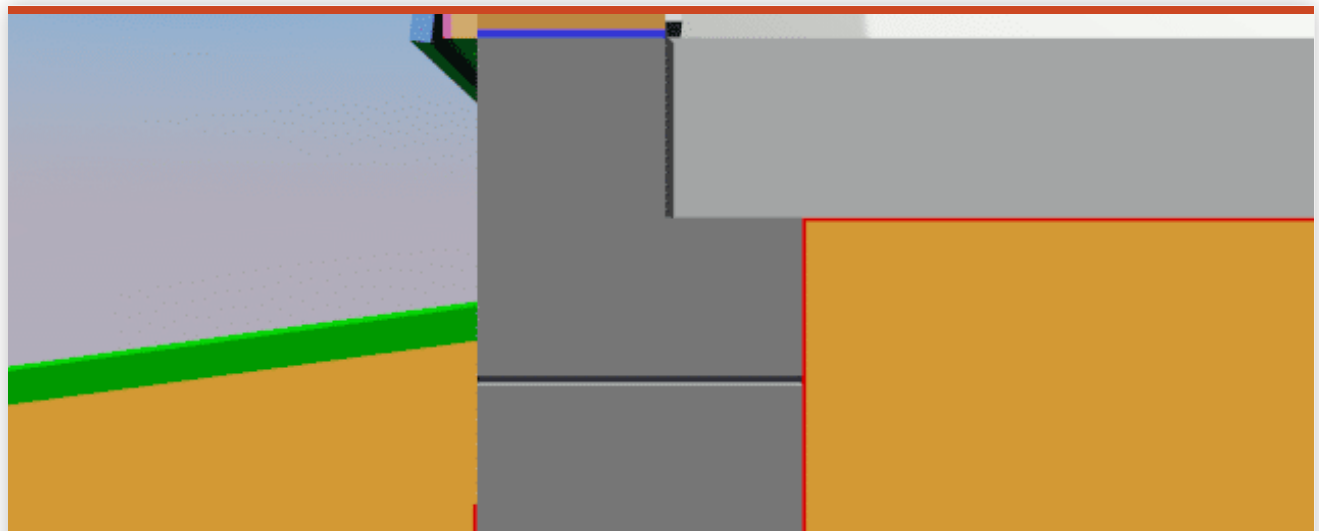




Insulation being installed on the inside of the stem wall before foundation is backfilled and poured.



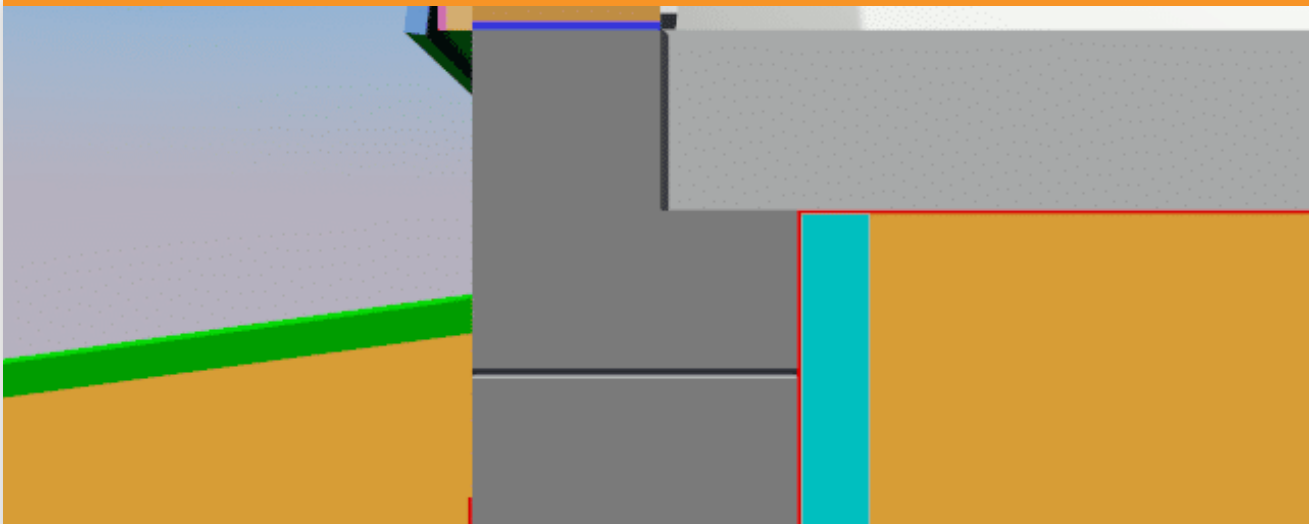
“Best” practice of insulating the stem wall perimeter and under the slab will help achieve the lowest HERS scores.



Incomplete Slab Insulation

Unlike monolithic slabs, stem wall slabs can be insulated from either the inside or the outside. Insulating the inside of the slab negates need for the termite inspection gap, provides protection for the insulation, and is often visually

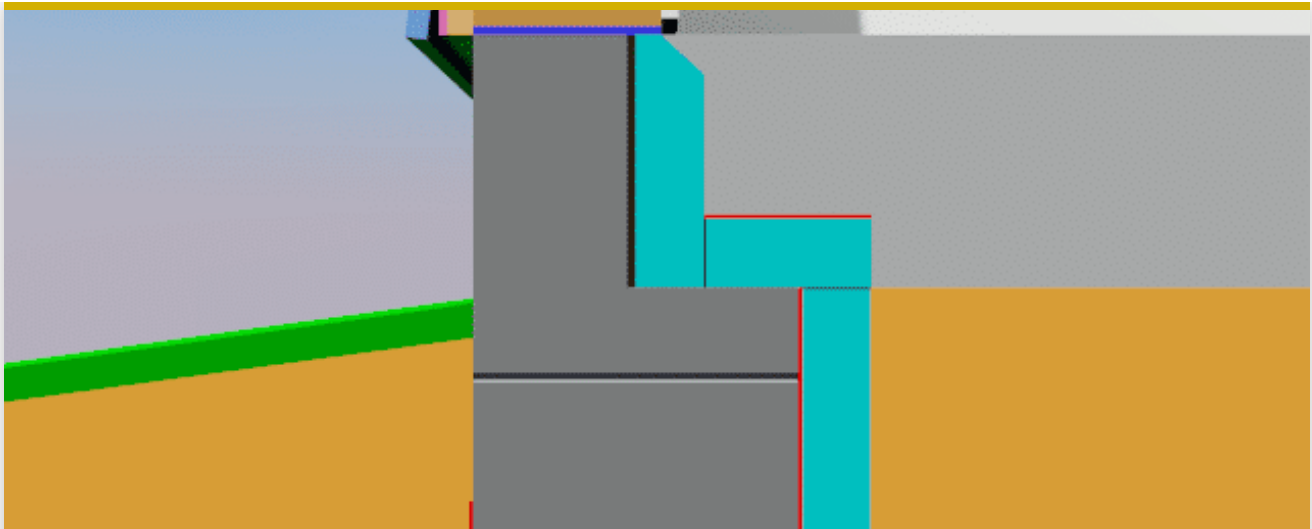
preferred. If left uninsulated, stem wall slabs still have the same potential for conductive heat loss.



GOOD

Perimeter Only

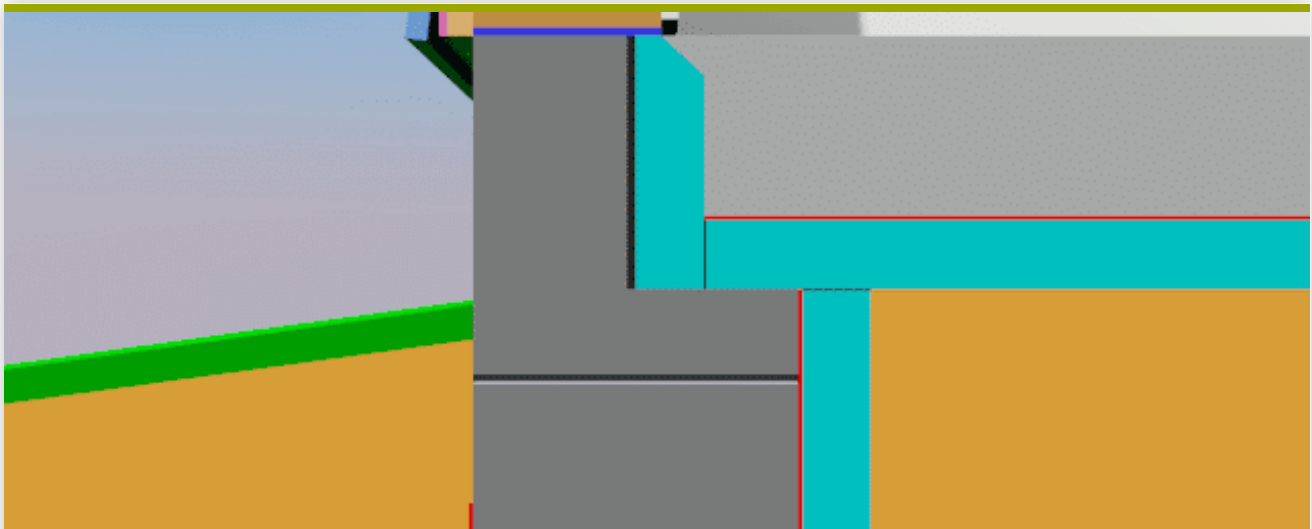
To maximize durability and thermal performance of the slab insulation, it is strongly recommended to install the insulation board on the inside of the stem wall. This will protect the insulation from damage during construction and after!



BETTER

Perimeter + Cut Block

Although perimeter insulation provides the greatest energy savings, under slab insulation should not be ruled out. This can add additional energy savings especially in cold climates. It can cover the entire under slab area or simply a two foot deep footprint all the way round.



BEST

Perimeter + Under

When possible, ensuring a continuous thermal break by separating the entire slab from the conditioned space should be a builder's goal. However, this can be complicated and working with your engineer and code official is recommended to ensure no issues will arise.

Monolithic Slab Insulation

If you are building on a monolithic slab you still have several options to properly insulate your slab. There will be some challenges insulating the edge between the house and garage, accommodating brick or stone facades, and protecting any exposed insulation. You should always defer to your foundation contractor on these details, but the benefits still far outweigh the difficulties. As a matter of fact, having insulation on the exterior exposed edge of the slab actually helps fortify the moisture barrier which rarely gets fully wrapped around the footing.



Installing slab insulation between the conditioned spaces and garage is an important detail for 100% slab edge insulation.

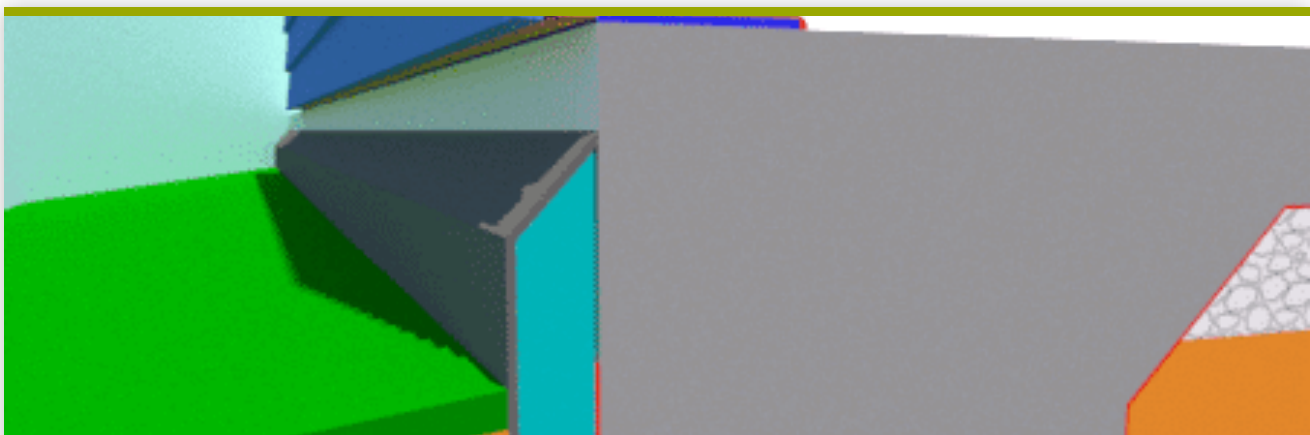
Perhaps the biggest concern regarding monolithic slab insulation is the fact that the

insulation that is above grade is exposed and vulnerable to damage. While slab insulation is more durable than often assumed, best practice is to protect it using a stucco or flashing material. It is also important to note that 2018 NCECC requires a two inch termite inspection gap between the top of the insulation and wood framing materials.



Partial Slab Insulation

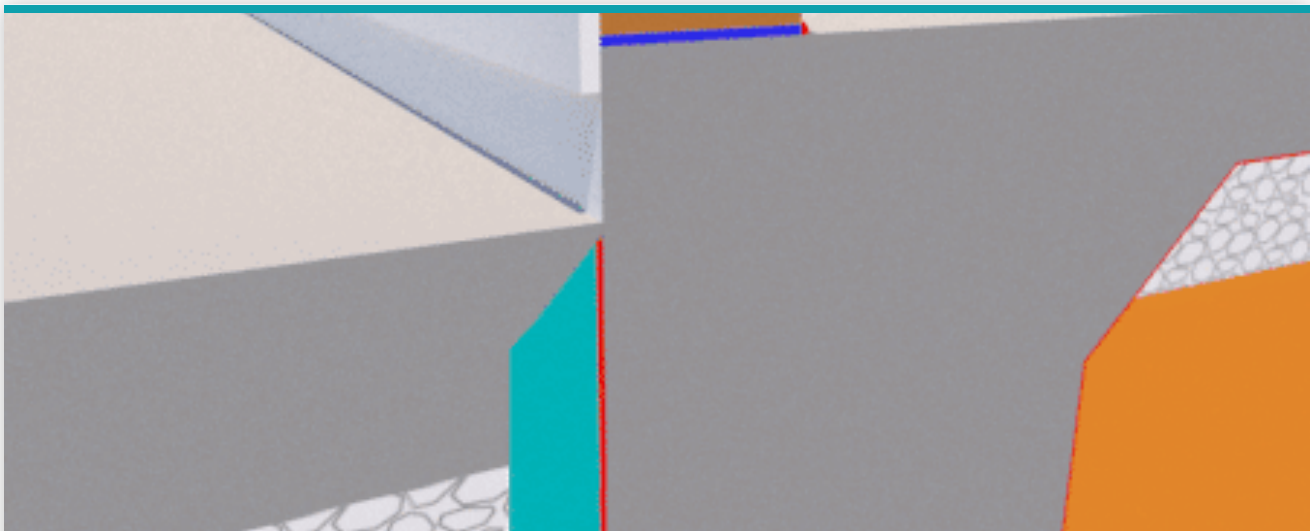
Perimeter slab insulation should cover as much of the exposed concrete as allowed by code. It can be tempting to cut the insulation at ground level to avoid seeing it, but this creates an area for heat to move in or out of the home and there will be heat loss through the floor and foundation if not fully insulated.



BEST

Perimeter Slab Insulation

NC code requires a 2" termite inspection gap be left at the top edge of the slab. When this is the case, builders should minimize the gap to the code requirements. It is also recommended that a protective layer (stucco or concrete slurry) be installed over the insulation to avoid damage during and after construction.



PRO TIP

Garage and Porch


Insulating garage and porch intersections is often a challenge for monolithic slabs. This image shows how this can be done properly. It is important to install insulation at all boundaries between conditioned floor space and exterior sections of the slab. Programs like EnergyStar require 100% slab edge insulation, including the detail areas.


Need help getting started?

Regardless of the slab type, complete insulation can drastically improve your home's performance, while ensuring compliance with local codes and energy efficiency programs! Many times it will also help increase any eligible utility incentives. We hope that this guide helps to simplify and streamline what can seem to be a daunting subject.

If you have any questions on how to best insulate your homes slab foundation, please [give us a call!](#)

GET IN TOUCH

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ABOUT US

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