Technical Bulletin: Slab Insulation

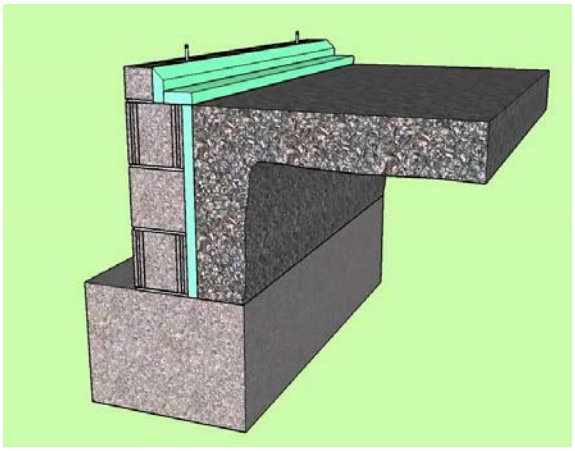
Residential New Construction Program

Quality installation of insulation at a home's **thermal boundary** (the border between conditioned and unconditioned space) is essential to qualify for the Duke Energy Progress RNC Program. For homes built on slabs, the perimeter and the underside of the slab are both parts of the home's thermal boundary. Installing slab insulation will both increase a home's energy efficiency and make residents more comfortable.

Slab Edge Insulation:

- *Stem Wall Slabs:* Stem wall slabs have a foundation wall placed followed by the poured slab. The insulation is on the interior side of the stem wall before pouring the slab. The homebuilder typically verifies this with documentation.
- *Monolithic Slabs:* A monolithic slab is poured in place using form boards. To insulate these, rigid foam is set around the form boards. Depending on the homebuilder's preferences, certain areas will miss slab insulation, such as porches, garages, and special facades. In these cases, the energy model should reflect the amount of insulated and non-insulated slabs.

Monolithic slab insulation



Stem wall slab insulation

Under Slab Insulation:

While less common than slab edge insulation, placing foam board insulation between the top layer of crushed stone and the concrete slab is another way to improve a home's thermal envelope. For both monolithic and stem wall slabs, the rigid foam board insulation should extend down the interior side of the concrete footing.

While this style of slab insulation is most effective if it is installed in contact with the entire underside of a slab, under slab insulation that only follows the perimeter of the slab is still much better for a home's energy efficiency than an uninsulated slab.

Under slab insulation example

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Common Issues (followed by visual examples):

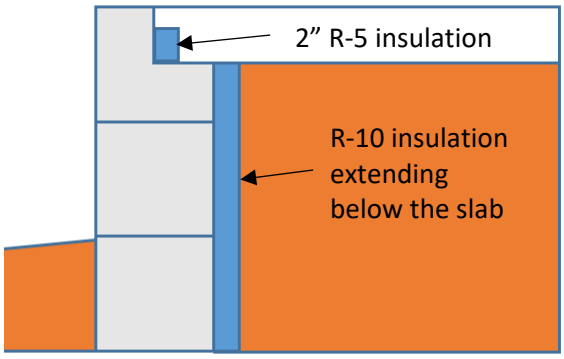
- *Misalignment of insulation:* This occurs when insulation is on foundations that don't separate conditioned and unconditioned space, such as garage slabs or patios and porches. This insulation cannot be included in the energy model.
- *Separated insulation:* Due to poor formwork and slab curing, insulation can separate from the slab lowering the quality of the insulation. In some cases, spraying non-expansive foam in the gap between the insulation and foundation can resolve this issue.
- *Removed or damaged insulation:* Insulation is often damaged due to the construction process. Depending on the damage of the insulation, it can be repaired with non-expansive foam or replacing the damaged insulation.
- *Incomplete stem wall insulation:* Stem walls need insulation on the lower stem wall portion **AND** the header block. A 2" tall piece of R-5 rigid insulation must be fastened to the header block with R-10 rigid insulation extending below the slab is the minimum requirement for stem wall slab insulation.

Misalignment of slab insulation on a garage foundation

Slab insulation separated from the foundation

A large portion of removed slab insulation.

A stem wall missing insulation on the header block



A diagram depicting the minimum requirements for stem wall slab insulation