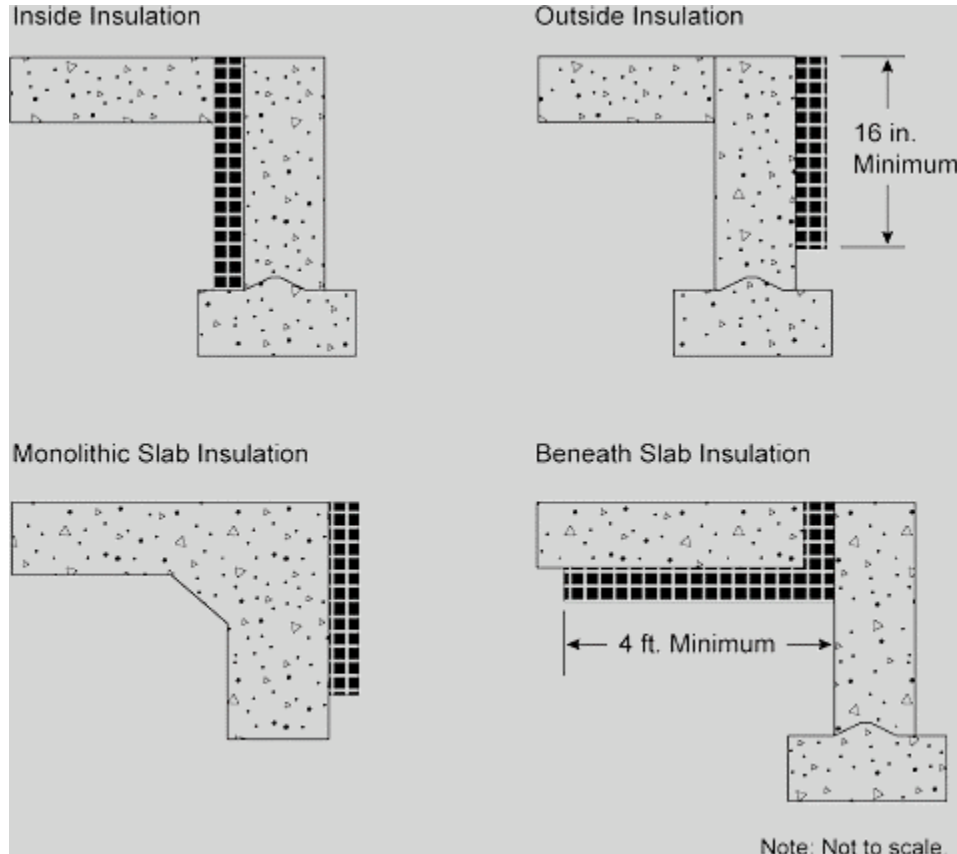


Technical Help

Slab Edge Insulation: Foil-backed Bubble Wrap vs. Rigid Insulation

I often have clients that either don't know what to use for slab edge insulation, or they don't even know when it's a requirement. Explaining how it works, why it's necessary, and what meets the requirement in the Standards can be a long conversation, especially if you're the one explaining and you don't completely understand yourself. Hopefully this short summary will help any of you that may be confused by the misinformation out there.

Let's start with what it states in the Standards. Slab edge insulation is only required as a mandatory measure when the slab is heated. "Radiant floor systems in concrete slabs must have insulation between the heated portion of the slab and the outdoors. . . The required insulation value . . . is either R-5 or R-10 depending on climate zone as shown in Table 4-8" of the 2005 Residential Manual. The accompanying diagram clearly shows what installation methods are allowed, whether the insulation needs to extend straight down, or wrap under the slab. Because heat moves upwards and sideways much more than down, the requirement only applies to the edge of the slab rather than the whole thing.



OK, so it calls for an R-5 in most climate zones. So what are the acceptable insulation materials? Rigid insulation is made from plastic foams that are filled with densely packed air cells. They are molded in a variety of standard size sheets, and they are extremely lightweight and easy to install. Structurally, rigid insulation turns out to be an ideal material because it is, well, rigid. So it can bear the weight of a slab. Also, you generally get higher R-values per inch with a rigid insulation (R-5 for polystyrene, R-6.5 for polyisocyanurate) compared to batt insulation (R-3.6), so you need less of it to achieve the required R-value.

But what about these reflective insulation materials we all have seen? You know, the reflective bubble wrap stuff? I'm always getting calls from clients who have been informed by their contractor (yikes) that this meets the requirement. No! It does not. Reflective insulators work well as radiant barriers, however they need at least a 25mm airspace next to the reflective layer to be effective. Also, compared to the comparative structural integrity of a rigid insulation, the flexible bubble wrap stuff just doesn't measure up. Over time the bubble wrap will break down, eventually collapsing the air layer necessary for any insulating benefit.

There is also a hybrid product out there, that laminates a layer of the reflective bubble wrap to a layer of polystyrene, supposedly to 'enhance' the R-value of the inherent properties of the rigid insulation layer. However, with this product there are the same drawbacks as the bubble-wrap alone, without any real benefits. In a 2004 article for Home Energy Magazine, researcher Don Fugler wrote that "the foil bubble pack tested was next to useless as sub-slab insulation." This now oft-cited study deflated the myth about reflective bubble-wrap insulation for slabs, but many still are unaware, and only have the product sales brochures that make many dubious claims.

So, when it comes down to it, stick with the good old rigid insulation for slabs. The bubble stuff just isn't worth it. Be clear with your clients when you know that they are installing a radiant slab. Make sure they know what's required and how to achieve it. None of us wants to get that phone call after the slab's been poured that they didn't know there was an insulation requirement!