



Slab Edge Insulation (SEI)

When building or renovating a home, most people appreciate the savings that correctly installed insulation can offer. Direct benefits allow home occupants to save money on artificial heating and cooling bills, as well as achieving more comfortable living all year round. Indirectly, the sensible use of insulation also helps the wider community by reducing greenhouse emissions that harm the natural environment. Many people are familiar with how effective roof and wall insulation is in achieving these aims. However, one of the less well-known areas where insulation is beneficial is beneath the home and for those building on a concrete slab it is important to understand how ‘slab edge insulation’ (SEI) will benefit you.

How does SEI work?

When designed correctly, the use of a concrete slab provides the bulk of ‘thermal mass’ for most homes. This helps keep the home at a relatively constant temperature, which is less likely to fluctuate relative to the outside temperatures (as opposed to homes with wooden floors). The concrete is dense and has a high thermal capacity – this means it is ideal for storing heat during the day that will be naturally released during the night to keep the house warm. Obviously, it is important to make sure that we minimize the losses from the edge of this ‘heat bank’. SEI is an effective way of minimizing heat losses from the edge of the slab.

Who Should Consider Slab Edge Insulation and Why?

Homeowners who are building a home with a concrete slab on ground can improve the thermal benefit to their home by applying SEI to the perimeter of the slab. SEI is most beneficial in colder climates, so it is ideal for the Canberra region. In some circumstances it may also be desirable to apply SEI to ‘suspended’ slabs.

Slab Edge Insulation is great value. Slab Edge Insulation:

- only costs around \$200 for a 100 square metre slab
- keeps the house warm in the colder seasons through better retention of stored heat in the slab
- slows your home heating up in warmer months by restricting direct sunlight heating up the slab edge (if exposed) or conducting undesirable heat from adjacent materials such as rocks, paving or garden beds
- should be included when installing in-slab heating (electric or hydronic)
- protects the slab from drying out too fast around the edges at pour time, or taking up surrounding moisture from the ground in the future
- increases your Energy Efficiency Rating (EER) for a relatively small capital outlay

Energy Efficiency Rating (EER)

AccuRate is the benchmark system for different EER rating software in Australia, and simulations on a 125 square meter home, indicate a 3% benefit in overall EER by including SEI.

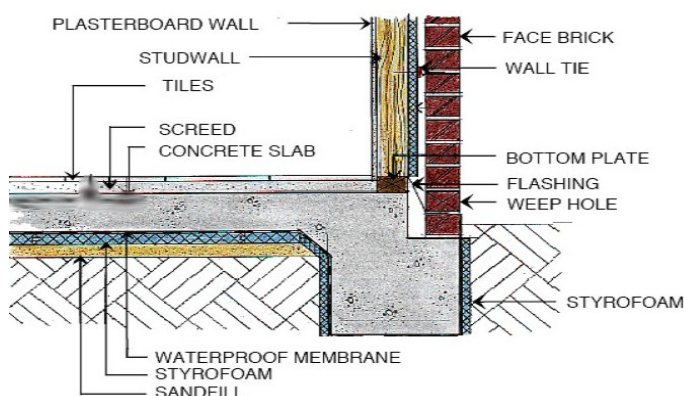
It is difficult to place an accurate figure on the actual improvement value obtained from SEI. Many experts state that EER software simulation underestimates the benefits accrued from SEI and does not accurately pinpoint the savings from gross overall figures.



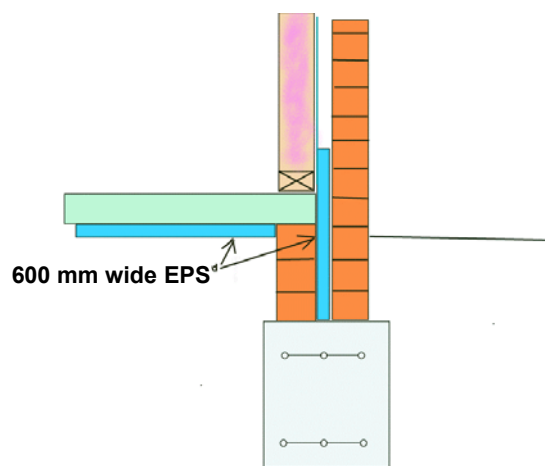
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How is SEI installed in new homes?

Slab Edge Insulation is added to the concrete slab at build time and should be discussed early in the planning phase with your draftsman and builder. Insulation boards of approximately R1.0 rating (70-80% of the benefits obtained from an insulation material, occur in the first R1.0) are laid horizontally under the slab edge and flush with the perimeter (prior to the concrete being poured). Vertical sheets of the same material are also applied directly to the outside edge of a concrete slab and then finished in a weatherproof protective coating, such as render.



The diagrams below show two possible methods for typical installation of SEI. There are also other less common methods for achieving SEI. For instance, it has been demonstrated that when using Thermacell insulated concrete forms (ICFs) for a wall material - the bottom row (resting on the footing), can be cutaway on the inside, to allow the concrete to form, leaving the outside and underneath of the polystyrene ICF to double as SEI.



Slab Edge Insulation Detail for Strip Footing Slab On-ground Construction

Can SEI be retrofitted to existing homes?

SEI can be retrofitted to existing homes provided you are able to access the slab edge and below. This method is far more time consuming and costly than at build time. It is important to note that extreme care should be taken when excavating around the footing, as this is an important structural component of your home.

You may also need to repair any damage to physical pest barriers that may have been breached as part of the excavation. Consult with a qualified building professional before considering a SEI retrofit.

Insulation products are suitable for SEI

The two main materials used for SEI are extruded Styrofoam (ES) and expanded polystyrene (EPS).

1) Extruded Styrofoam insulation is a closed cell structure that minimizes moisture transmission and is rated as a self-flashing surface. It has a very high resistance to compression when compared to EPS and does not decay over time (as is more common with open cell materials). ES has a higher rated R-value for thickness as opposed to its EPS counterpart and this increases in proportion to EPS degradation too.

Unfortunately all these benefits come at a far greater price than EPS products.

2) Expanded Polystyrene has a cell structure that is not fully closed. Water can be transmitted and retained in the material. The main effect of this is that EPS can degrade over time. EPS is a relatively inexpensive material compared to ES. In an effort to improve performance some manufacturers have launched a new 'higher density' version of EPS to increase its performance.

Insulation type	Thickness	Approx Insulation Value	Indicative cost per sq metre
ES board	25mm	R 0.9	\$18-\$20
ES board	30mm	R 1.00	\$20-\$25
ES board	50mm	R 1.73	\$40
EPS board	40mm	R 1.00	\$8-\$10
EPS board	25mm	R 0.7	\$5
EPS high density	35mm	R 1.0	\$12
ICF block (EPS)	NA	NA	NA

Which product & where?

Just pick up the phone book to get a quote from the many product suppliers and installers of SEI. It pays to be aware that there are many similar products on the market. A common market strategy for manufacturers is to colour their products too. What is most important when shopping around, is to query the material type and standard R value. Remember the cheapest solution is not necessarily the best!

A range of other fact sheets on saving energy and money in your home are available from HEAT

Checklist for Slab Edge Insulation (SEI)

For a smooth transition to SEI remember:

- add SEI to your shopping list when you intend to build with a; slab-on-ground for either the entire home or even part of the build;
- choose which type of material suits you best and get some per square meter quotes so you can add this to your building budget;
- check that your draftsman or builder knows you wish to have SEI;
- make sure the SEI is detailed on your plans prior to submission; and
- check that the Energy Assessor has taken into account SEI for your EER



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