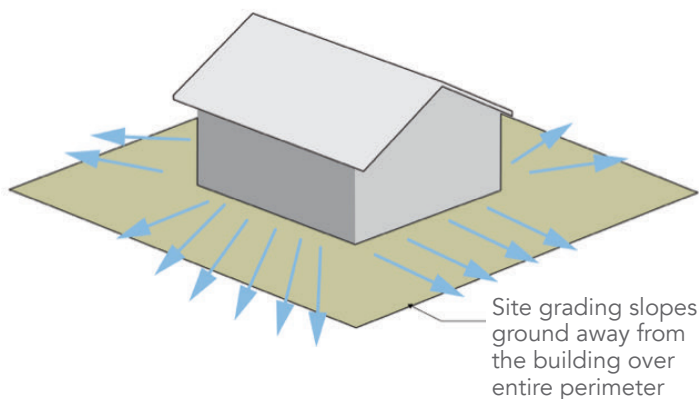


# Protection of Stone Wool Insulation for Foundation at Grade

By Joseph Lstiburek, Ph.D., P.Eng. | [www.buildingscience.com](http://www.buildingscience.com)

Where foundation insulation is on the exterior of foundations and touches the ground it needs to be protected.

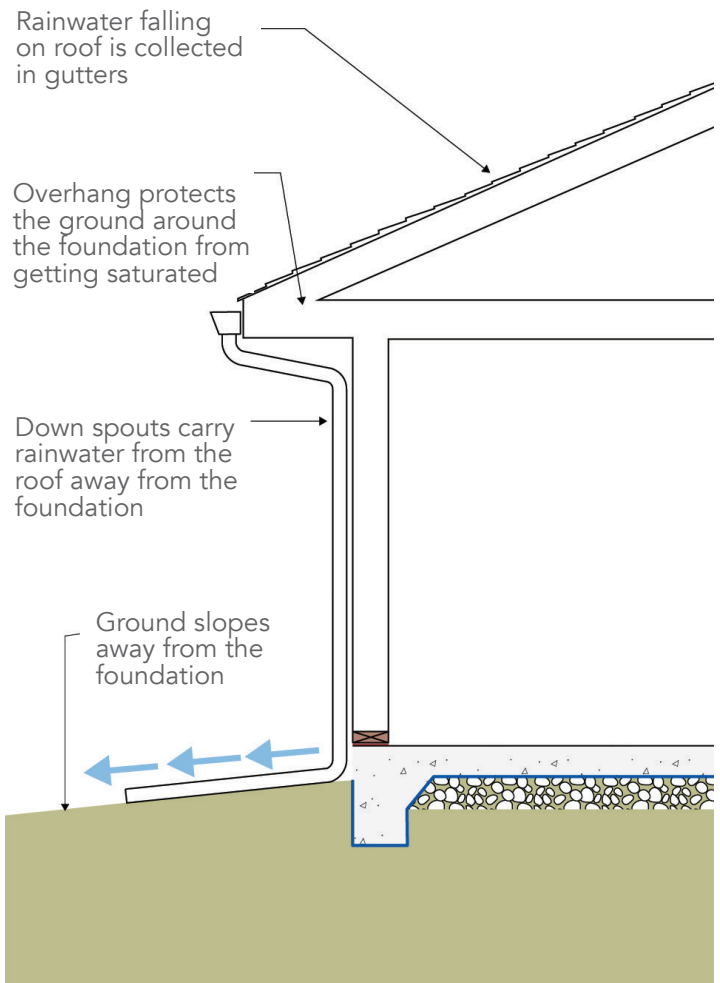
One of the most overlooked issues is protecting insulation from insects and animals – this is not just a “moisture” issue. Insulation works extremely well on the outside of slab and basement and crawlspace foundations. We have known this for a very long time. What we have also known for a long time is that we don’t want the insulation to become an insect “interstate” and a home for animals.



**Figure 1** Site Drainage - Drain the water away from your building perimeter

The first obvious requirement is to drain the water away from the building perimeter (Figure 1). Gutters, and downspouts should be used. Surface water should not become groundwater beside the building (Figure 2). Slabs are straightforward (Figure 3). Note the protection board or panel. Note the flashing set in mastic at the top of the foundation. This is for termites. Note the perimeter pest protection. In many, many jurisdictions a removable strip of insulation is required in order to provide the ability to inspect the integrity of the “insect defenses” (Figure 4). The strip is often “friction fit” between the bottom plate and the foundation insulation.

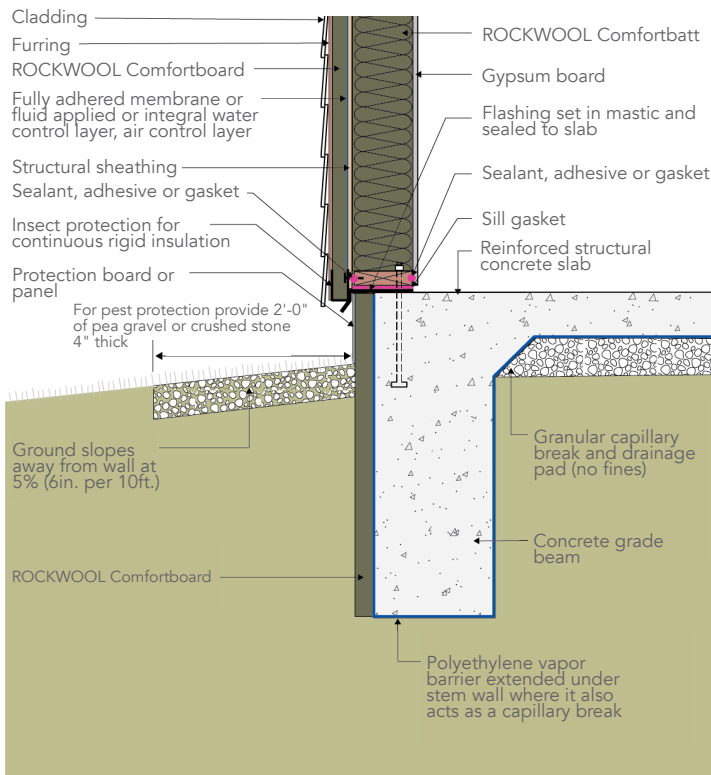
Basement foundations insulated on the exterior use a similar approach as slabs (Figure 5). Note the protection board or panel. Note the flashing set in mastic at the top of the foundation for termites protection. Note the perimeter pest protection.



**Figure 2** Gutters and Downspouts - Don’t make surface water become groundwater beside your building

Crawlspaces insulated on the exterior should be treated in a similar manner to basements insulated on the exterior. If you insulate them on the interior an inspection gap should be provided (Figure 6). This is a requirement in many jurisdictions.

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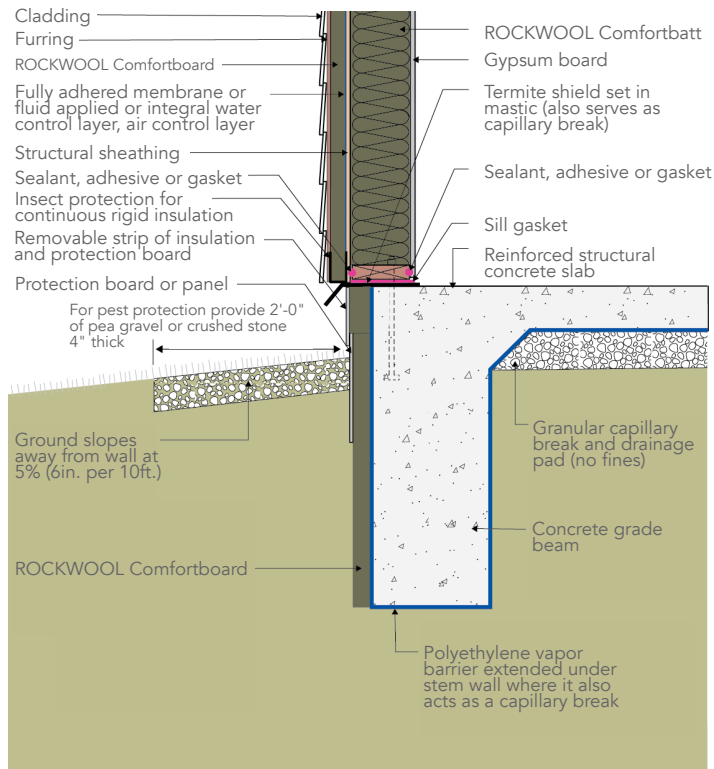
**Figure 3** Slabs - Note the protection board or panel. Note the flashing set in mastic at the top of the foundation for termites. Note the perimeter pest protection



**Photo 1** Stucco as Protection - It has impact limitations



**Photo 2** Fully Adhered Membrane - "Roofing" strip used to protect slab edge insulation



**Figure 4** Inspection - In many, many jurisdictions a removable strip of insulation is required in order to provide the ability to inspect the integrity of the "insect defenses"

In terms of insulation protection approaches one of the most common used is stucco (Photograph 1)...but it has limitations. It can be damaged easily with accidental impacts...the "weed whacker problem"....the "baseball problem". If you use stucco you need to be aware of its limitations. Having noted that it is popular due to its attractive appearance.

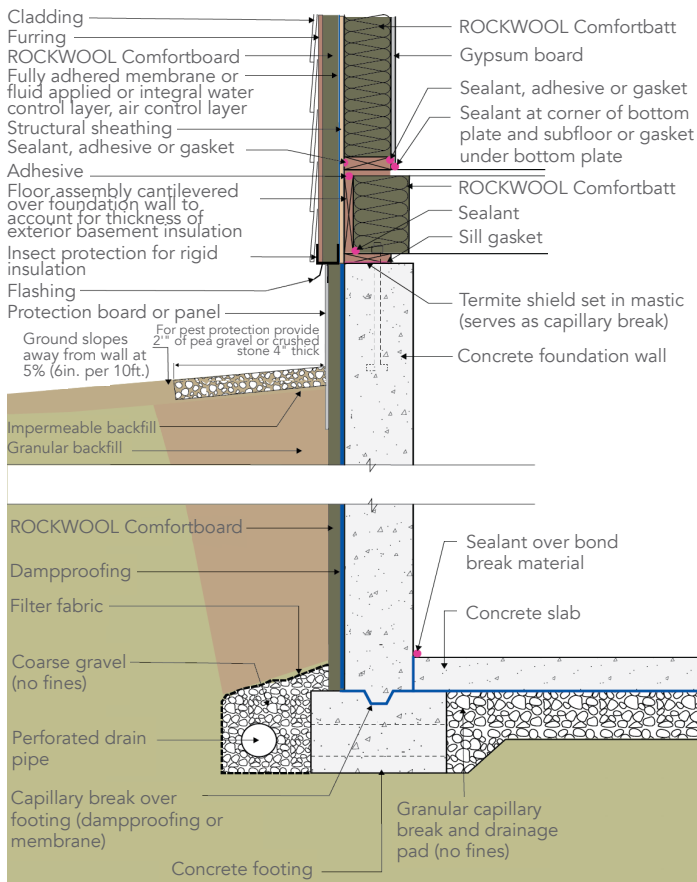
A fully adhered membrane "roofing" strip can be used to protect slab edge insulation (Photograph 2).

Fiber cement board also has limitations. Most manufacturers of "fiber cement" sheets do not recommend "ground contact" with their products...but not all manufacturers of "fiber cement" sheets. It is a "manufacturer to manufacturer" issue. Similarly, most manufacturers of "cement" board sheets do not recommend "ground contact"....but not all manufacturers.

"Pressure treated" plywood sheets are also used to protect exterior rigid foundation insulation. Again, the approach has limitations due to the absorptive characteristics of the treated plywood.



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**Figure 5** Basement Foundations - Same approach as slabs. Note the protection board or panel. Note the flashing set in mastic at the top of the foundation. Note the perimeter pest protection

Fiber cement, cement and plywood sheets can also be installed over furring rather than directly over insulation to provide additional moisture resistance. When this is done it is important to address termite and pest issues. The top of the sheets need to have a physical barrier over the air gap created by the furring. This is typically done with flashing set in mastic as noted earlier.

Aluminum sheet board stock can be used to protect exterior rigid foundation insulation (Photograph 3). Rigid insulation with a membrane seal prior to installation of the aluminum...the aluminum is installed directly on the rigid insulation...the membrane seal is to handle insects (Photograph 4). This works with rigid stone wool insulation.

Exterior foundation insulation can also be protected by rigid metal sheeting installed directly over the insulation (Photograph 5).

Figure 7 illustrates a shallow frost protected foundation that has the rigid horizontal insulation protected by a concrete "skirt" as well as a fully adhered membrane and a strip of aluminum or alternatively a strip of cellular PVC (Photograph 6, Photograph 7 and Photograph 8).



**Photo 3** Aluminum Sheet – Rigid insulation with a membrane seal prior to installation of the aluminum



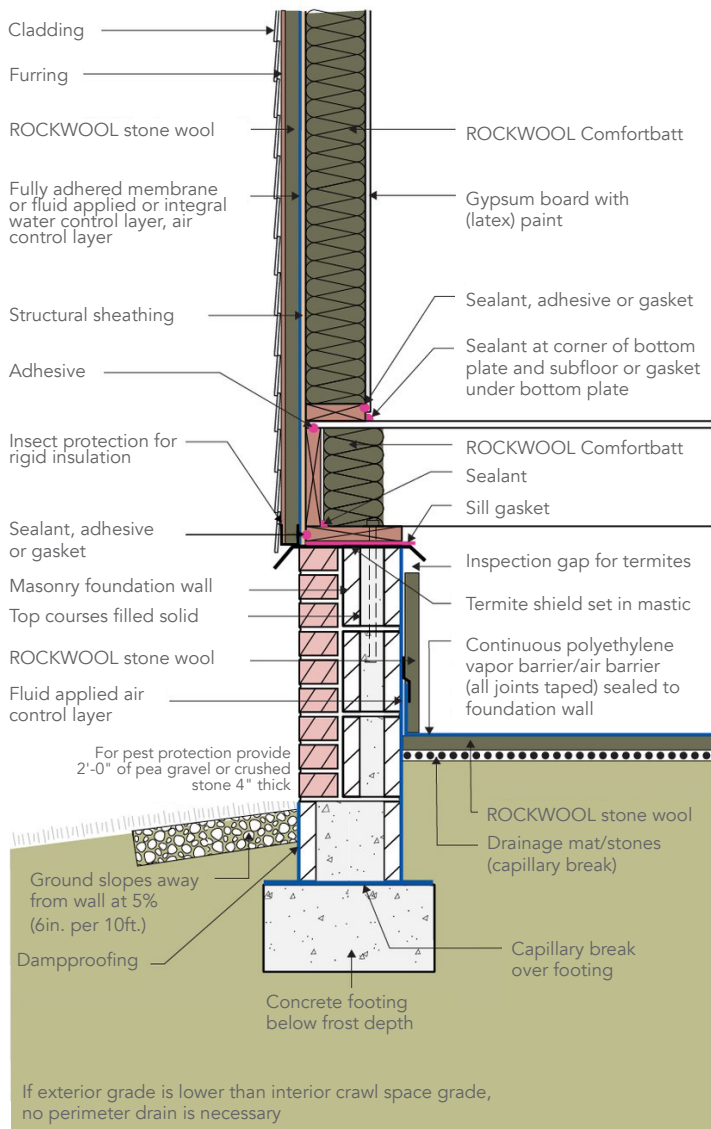
**Photo 4** Aluminum Sheet – Completed installation



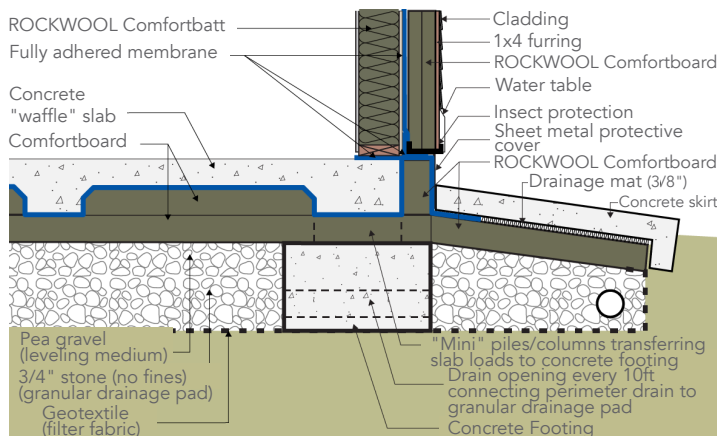
**Photo 5** Rigid Metal Sheetting - Exterior foundation insulation is protected by rigid metal sheeting



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**Figure 6** Crawlspace Insulated on the Interior - Note the inspection strip. This is a requirement in many, many jurisdictions



**Figure 7** Shallow Frost Protected Foundation - Rigid horizontal insulation protected by a concrete "skirt" as well as a fully adhered membrane and a strip of aluminum or alternatively a strip of cellular PVC



**Photo 6** Shallow Frost Protected Foundation – Rigid horizontal insulation



**Photo 7** Concrete Skirt – Protecting rigid horizontal insulation



**Photo 8** Cellular PVC - Fully adhered membrane and a strip of aluminum or alternatively a strip of cellular PVC protecting the insulation.

Stucco works. Fully adhered membrane strips work. Aluminum sheets work. Fiber-cement and cement board sheets work – follow the manufacturer's installation instructions. Cellular PVC works.

Note that not all manufacturers recommend their products for this application.

It is necessary to deal with the insect pathways.



For more information about the termite resistance of **ROCKWOOL** stone wool insulation, visit [rockwool.com](http://rockwool.com).



To get in touch with the **ROCKWOOL** Technical Services team, visit [rockwool.com/north-america/contact/](http://rockwool.com/north-america/contact/) or call at 1-877-823-9790

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