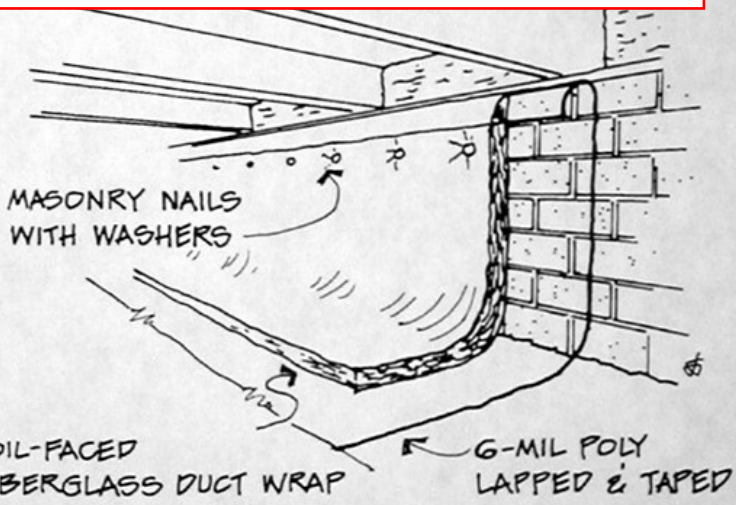

Figure 2. Tennessee Valley Authority researchers found that insulated, unvented crawlspaces worked well both winter and summer. The crawlspaces in the test homes were kept dry with lapped and taped 6-mil poly ground covers.

moisture than vented ones. In the TVA experiments, the homes had proper drainage and a taped 6-mil poly ground cover that ran up the full height of the foundation walls (Figure 2). Inexpensive fiberglass batts were used on the interior.

If you can keep moisture from the ground out of the crawlspace, why treat it differently than a full basement? Who vents full basements?

Full basements

Should the basement be inside or outside the building shell? In general, I'd rather see it inside for the same reasons that apply to crawlspaces. It is tempting to insulate basement ceilings in retrofits where the basement walls are covered with 100 years of crud inside and out. But frozen pipes are not a pretty thing, particularly if they burst.

With exterior basement insulation, special problems occur at bulkheads, concrete stairs, and abutting slabs. They can bleed heat off the foundation. One approach is to separate the bulkhead wall or slab from the main foundation wall with a piece of rigid foam. Rebar can connect the elements through the foam if required.

Mudrooms

Attached spaces that get frequent use, such as airlock entries and mudrooms, should be inside the thermal envelope. If not, they invite the growth of mold since the rooms receive household moisture but little heat. They're also more useful spaces if they're warm.

Spaces used intermittently, such as enclosed porches, can go either way. But if unheated, they should be isolated from the house's moisture as well as its heat.

Spaces that have a high moisture source but are only heated occasionally present a special problem. Spas and some kinds of workshops are examples. They are most easily treated as separate thermal and ventilation zones outside of the home's primary thermal shell. Lots of ventilation is in order. The insulation level can be adjusted down to the expected level of use.

Sunspaces

Sunspaces are always insulated from the outdoors, but should they be insulated from the house? In climates that have frequent spells of cold and cloudy weather, it is a good idea to insulate and seal between sunspace and house—assuming that you're not trying to keep plants alive all winter. If you are, you'll need to bleed heat back into the sunspace and may even find yourself heating it at times. The insulation between sunspace and house can be less than the regular wall insulation thanks to the buffering effect of the sunspace. The air seal between sunspace and house should be tight, however, to keep greenhouse moisture out of the house.

Sunspaces with uninsulated mass walls between sunspace and house are fine in very sunny climates that can keep the mass warm all winter. Night insulation is desirable in these sunspaces—essentially oversized Trombe walls—since now the sunspace glass is part of the thermal envelope.

Interior bumps

Interior walls, built-in's, stairs, and plumbing fixtures can disturb the continuity of the thermal shell. Good planning can sidestep most of these problems in new construction. In retrofits, it's not so easy.

What to do? In new construction, anticipate! If at all possible, get your insulation and air/vapor barrier in place before partitions, stair stringers, cabinets, dropped ceilings, and other complications. This keeps the thermal shell simple.

In retrofit, there are no easy answers. Each job is different and demands innovation. But knowing where you would want to have that unbroken thermal shell if you could is a good way to start making real plans.