

## QUESTIONS & ANSWERS

### Mass-wall Finishes

**Q:** In a passive solar home I am building, the entire first floor is enclosed by vermiculite-filled, 10-inch concrete block externally insulated by 2-inch-thick polystyrene. I am inquiring about the efficiency of covering the interior surface of the block with drywall that would be attached directly to the concrete by adhesive. Will heat be absorbed by the drywall and thereby conducted to the underlying masonry?—*David Kallett, Pompton Lakes, N.J.*

**A:** If the walls are to absorb and store solar heat, the surface should have high absorptance (dark color) and conductivity that equals or exceeds that of the storage materials so that heat will flow into the wall at least as fast as if it were uncovered.

You mention that most of the walls will not receive direct sunshine, but will absorb heat from the room air. In this case, the color of the surface has little importance. Plaster would probably be your best bet, since its thermal properties are about the same as concrete block, and it would bond tightly to the block.

Gypsum board is almost as conductive as concrete block ( $k = 4.4$ , vs. 5.0 for concrete block). More important, however, is its bonding to the block. Gluing in the typical fashion (beads of glue applied with a caulking gun) will leave air spaces that will impede the heat flow. So if you can't plaster the block, how about just painting it?

By the way, directly irradiated mass is several times more effective than convectively coupled mass.

### House Monitoring

**Q:** I would like to know where I can obtain information regarding the monitoring of a passive solar residence, including equations, type and location of monitors, and analysis of data. A lot of information appears about predicting solar performance, but I can't seem to locate monitoring descriptions.—*George Buffalo, Broomfield, Colo.*

**A:** There are many ways to monitor the energy flows in a house, ranging from a utility-bill audit at one end of the spectrum to a fully instrumented analysis at the other. Which route you should choose depends on your need for accuracy and your budget. To do sophisticated monitoring requires experience with instrumentation and a large investment in money and time. If you wish to go this route, you might try contacting the engineering department of your local university for assistance. If you are unable to beg or borrow the equipment, low-cost

(\$1400 - \$2000) monitoring hardware may be available this fall (for information, contact, Richard Sydlowski, Lawrence Berkeley Laboratory, Berkeley, CA 94720). Information on low-tech energy auditing should be available from your local utility. A good summary of the technical issues in monitoring including general equations appeared in "How To Get The Facts", *Solar Age* 7/82.

### Moist Crawl Space

**Q:** I read your article, "Controlling Moisture in Houses", (1/84), but it did not touch on this particular problem. I am having trouble controlling moisture in a crawl space. I believe the house is over a wet-weather spring.—*Virginia Riffie, Georgetown, Ky.*

**A:** According to researchers Charles Jennings and Thomas Moody, who worked on TVA's weatherization program, installing a ground cover can reduce moisture from capillary rise by up to 90 percent. Heavy polyethylene works well since it resists deterioration by fungi. Covering the poly with one or more inches of sand will protect it from occasional trampling. In new construction the poly should be lapped and carried up the walls several inches, at least to the grade line.

In retrofit, Jennings and Moody recommend leaving about 20 percent of the ground uncovered so that the structure is not subjected to undue shrinkage and movement. In particularly wet spaces, they suggest first covering 50 percent, then finishing up to 80 percent in 10 percent increments every 4 to 6 weeks to reduce the "moisture shock".

A ground cover should be used in conjunction with ventilation. The HUD standard, typical of others, recommends four vents with a total minimum free vent equal to 1/150 of the floor area if there is a ground cover, 1/1500 with the ground uncovered. For best results, place two vents each on opposing walls. Remember, these are minimum values for average conditions. Your building may need special measures. With a wet weather spring, you'd do well to install a sump pump.

*Address questions about articles in Solar Age to Q&A, Solar Age, Church Hill, Harrisville, N.H. 03450. If you want a reply, send a self-addressed stamped envelope and a member of our staff will respond. Questions and answers of general interest will be printed in the magazine.*