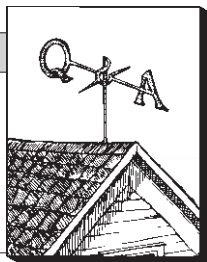


Garage-Slab Thickness

by Hank Spies



Q. *How thick should I make a floating slab for a garage, 4 inches or 6 inches? Can it be thinner if I use a product such as Fiber-mesh?*

A. If the garage is to be used only for automobiles, a 4-inch slab should be adequate. That may not be true for driveways, however, which may have occasional traffic from heavy vehicles such as garbage trucks. Of course, the slab should be poured over compacted fill and a drainage layer to prevent settling. A product such as Fiber-mesh primarily prevents small tension or shrinkage cracks on the surface, which increases durability of the concrete. It will add some to the strength of the slab as well, but the increase in flexural strength is not enough to justify any significant reduction in slab thickness.

Roofing Ban Questioned

Q. *Regarding the recommendation of the Asphalt Roofing Manufacturers Association (ARMA) not to use asphalt roofing applied directly to stressed-skin panels, what about panels with integral ventilation, such as Branch River's Air-Flow panel? It seems that these should provide adequate ventilation to prevent excessive heat build-up or moisture problems.*

A. I think each brand of panel would have to be tested to determine its effect on the temperature of the asphalt shingles. It would also depend on the length and slope of the panel, because the surface friction increases with the length, reducing the air flow, and the stack effect increases with the slope. Considering all the variables in both design and installation, I think ARMA may have overreacted by including all insulated panels in its warning. If the panel manufacturer would assume the shingle warranty, then I would consider using them.

Filling Cavities

Q. *Is it acceptable to insulate between a brick veneer and the block structural wall? What insulation materials are recommended?*

A. It is possible to insulate between brick veneer and block backup in a cavity wall. There are two methods that are commonly used. The first is to install polystyrene foam boards between rows of ties or speared onto the ties, but an air space must be left between the brick and the polystyrene to allow any water penetrating the brick to drain down to the weep holes. Otherwise, the insulation can bridge the water to the block. The insulating values obtained with this method are usually much less than anticipated due to the conductivity of the ties and the convective loops formed around the insulation board as differential movement occurs between the brick and the block.

Many people are not aware of the differential movement between brick and block. The block is at its largest

when it comes from the plant—it steadily shrinks as it dries. Brick, on the other hand, is at its smallest as it leaves the kiln, and grows irreversibly as it absorbs moisture. A brick wall 25 feet long may grow as much as 3/4-inch from absorbed moisture. This differential movement moves the ties, sometimes breaking them or pulling them loose. The resulting shifting in the insulation board leaves spaces for convective loops to transfer heat between the walls.

The second method is to use perlite or vermiculite poured into the cavity. It will be necessary to leave the fiberglass or polypropylene ropes in the weeps to keep the insulation from running out.

The best method of insulating a cavity wall is still furring and insulation on the inside.

Footing Drain Details

Q. *Do footing drains need to slope to a low point, or can I just run them level and let the water run out as it rises? Also, should drains go inside the foundation wall, outside, or on both sides?*

A. It is best if the footing tiles slope toward a low point, but if the perimeter tile is less than 200 feet long, it can be laid level. That assumes that it is installed over compacted fill and set so it will not settle. A slope of an inch per hundred feet should be adequate and should be better than a flat tile, since it can compensate somewhat for irregularities in grade.

The question of where to put the tile varies with the waterproofing or dampproofing system used. If a drainage membrane is used on the outside of the wall, the tile should be in the outside to intercept the water conducted down the wall. A 2-inch diameter weep hole through the footing should be installed every six feet leading from the drainage layer under the floor slab to the drainage layer around the tile. If the only drainage system is a gravel fill against the basement wall, it would not make much difference. In a survey conducted by NAHB, there seemed to be fewer problems reported with the tile on the inside than on the outside, but the same weep holes are needed to connect the two drainage layers. The tile should be drained to a sump and pump or to a gravity drain.

If the water problems are severe, a tile on both sides of the footing might well be in order. If the water table is sometimes above the basement floor, a set of tiles on about 10- to 12-foot centers across the drainage layer beneath the slab should be considered. ■

Henry Spits is with the Small Homes Council-Building Research Council of the University of Illinois. Questions for this column should be sent to him at New England Builder, P.O. Box 5059, Burlington, VT 05402.