



# Heating Houses With Water Heaters

by Hank Spies

**Q.** *Can potable water from a conventional water heater be used for space heating with a fan/coil unit? Some codes apparently restrict using it.*

**A.** I know of installations using potable water from the water heater that have been in use for more than 30 years. It can work well if the system is properly designed and sized. While the temperature of the water to the fan-coil will usually be lower than the design temperature for a standard hydronic heating system, it might be higher than is needed for domestic hot water. The domestic water system should never be over 140°F. A tempering valve can be installed to reduce the temperature of the domestic water system while keeping the heater set high enough for efficient heating. He fan-coil must not contain lead-based solder, but none of the units made today do, to the best of my knowledge. There were some fears that a water heater used like this might lime up faster, but the opposite seems to be true. Depending on the local water quality, however, there could be more corrosion because fresh water contains more dissolved oxygen, which is not present in a closed system.

## Cantilever Limits

**Q.** *How far can I safely overhang the foundation with floor joists on a two-story home? What joist size and spacing do you recommend for a given overhang?*

**A.** There are so many grades and species of wood used for floor joists that the question is impossible to answer in the general case. If the outer end of the overhang is supporting the wall loads, it also depends upon the span of the floor joists on the second floor and the roof span, whether the framing is joist-and-rafter or trusses. The calculation for a specific circumstance is a job for a structural engineer.

However, if the wall load is directly over the foundation, with the

cantilever supporting a balcony or similar structure, some generalizations can be made. If the cantilever is fastened to the wall framing with an adequate connection (a lap on the floor joist of at least twice the cantilevered distance), the cantilever can extend 1/4 the allowable span for the grade, species, and spacing of the lumber used. If the member is continuous from a center support and over the foundation or bearing point, it can extend a maximum of 1/3 the actual span of the joist.

## Floor Insulation

**Q.** *What is the best way to insulate the floor of a building set on piers?*

**A.** Probably the easiest is to install 1-inch (or more) foil-faced insulating sheathing over the bottoms of the floor joists. Assuming a cold climate, the heat flow would be downward and the foil would provide a real benefit—about R-7, plus the value of the foam, also about R-7. The plywood or OSB floor deck should provide an adequate vapor retarder on the warm side.

An alternative would be fiberglass batt insulation with the vapor barrier on the top, supported on chicken wire attached to the bottom of the joists. Or you could spray urethane foam or mineral wool and adhesive directly to the bottom of the floor. In any case, you should use a UV-resistant plastic groundcover if the airflow under the building is restricted.

## Slab Drawings vs. Reality

**Q.** *Most section drawings of monolithic slab-on-grade foundations show very neat and regular angle and vertical cuts in the gravel. How does one form this in gravel? Is there some sort of metal form used that the drawing does not include?*

**A.** This is a case of the pen being mightier than the shovel. No form is used, and the soil and gravel are shaped

as regularly as feasible. The sides of the trench should be reasonably straight (burying a wood form beneath the slab is bad practice, especially in termite territory) and the granular base is sloped at the angle of repose of the material. Since that is difficult to draw, straight lines are used.

## Cutting Vinyl

**Q.** *How can I cut a clean line through existing vinyl siding? When cutting new window and door openings, I have had trouble with the old vinyl cracking and chipping, causing more extensive repairs to the siding than should be necessary.*

**A.** Many builders reverse a fine-tooth saw blade, such as a plywood blade, in a portable saw, and feed it very slowly. The vinyl should be clamped as tightly as possible to avoid vibration. If the vinyl is not too brittle, a utility knife can be used to score the vinyl to keep it from chipping, or the cut can be made through a strip of masking tape, which also reduces chipping.

## Pointing Problems

**Q.** *What causes the mortar in concrete block walls to crack and how can it be repaired?*

**A.** The mortar between concrete blocks is in tension. The tensile strength of mortar is very low and it is not flexible, so almost any movement will appear as a crack. The best repair is to chisel out the existing mortar and replace it with new mortar, a procedure known as tuck-pointing. Caulking an opened mortar joint is a cosmetic repair, but the caulk has no structural value. ■

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