On the House

Steam Room Details

Q. *My customer wants to have her combination steam room–shower tiled with a nonglazed floor and wall tile she has already purchased. Is the tile suitable for this type of application? I would use Hardie's Tile Backer for a substrate and the appropriate thinset mortar.*

A. *Michael Byrne, a* JLC *contributing editor, responds:* Your question would be simple to answer if I could refer only to the tile, but given your uncertainty about such a basic issue, I wonder what your thinking is on the other important aspects of the installation? For instance, what do you consider an "appropriate" thinset? And how will you be using the Hardiebacker?

This is one of the most difficult of all tile installations to properly specify and install. First, I would stay away from using any unglazed tile in this area except for the floor, where slip resistance is desired. Unglazed tiles in a steam room may cause maintenance problems because salts tend to build up in such areas; salts are more easily cleaned off glazed tiles and may prove difficult to remove from the surface of unglazed tiles.

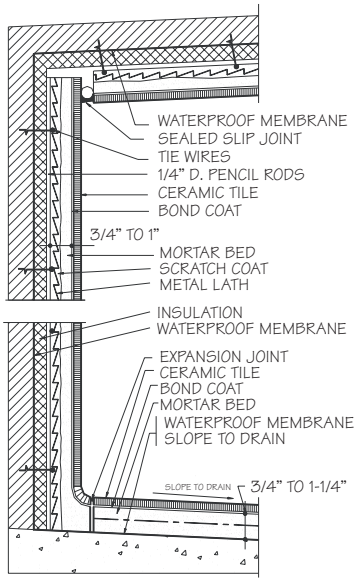
Have you checked with the backerboard manufacturer to see if its product can be used in a steam room environment? Some backerboards may not be suitable for such use.

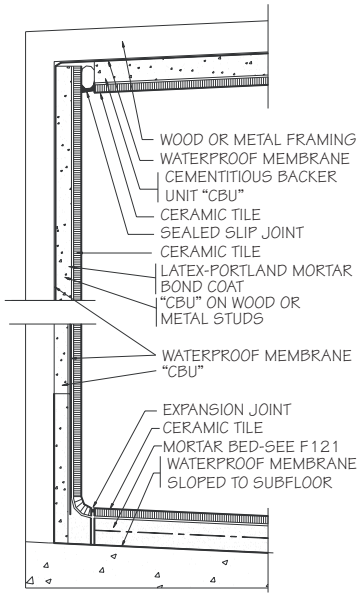
You say nothing about how the floor of the shower will be built. Certainly, you should not expect to use backerboard there, since the floor must be sloped to the drain. Also, cement backerboards are known to wick moisture: Therefore, the junction between the wall and the floor setting bed will require a waterproofing detail that may differ from one brand of backerboard to the next.

On steam units, I always recommend a surface-applied waterproofing mem-

STEAM ROOMS
Membrane

Cement Mortar **SR613-02** **Thin-bed** **SR614-02**





Requirements:

- steam rooms require a waterproofing membrane on all surfaces to prevent moisture from penetrating adjoining spaces.
- some membranes will require insulation on walls and ceilings to protect them from excessive heat.
- slope ceilings (2" per ft. minimum) to avoid condensation from dripping onto occupants (sometimes sloped to center to minimize rundown on walls).

Material and Tile Installation:

- attach four equally spaced tie wires to the supporting members and through the insulation. Attach 1/4" D steel pencil rods vertically over the insulation. Attach metal lath to pencil rods on both walls and ceilings.
- install open slip joints in all corners between walls and ceilings and to divide areas that exceed 16'-0" in length.
- floors—follow Method F121.
- walls and ceilings–follow Method W221.

NOTE: Waterproof membrane is shown in two different installation locations on wall. Specify one or the other.

Requirements:

- steam rooms require a waterproofing membrane on all surfaces to prevent moisture from penetrating adjoining spaces.
- slope ceiling (2" per ft. minimum) to avoid condensation from dripping onto occupants (sometimes sloped to center to minimize rundown on walls).
- waterproof membrane must be capable of withstanding heat exposure.

Material and Tile Installation:

- tile—A137.1 and certified by manufacturer for wet environment.
- cementitious backer units—ANSI A108.11 and A118.9.
- reference and follow membrane manufacturer's installation directions for placement of membrane.
- install open slip joints in all corners between walls and ceilings.
- floors—follow Method F121 or F122
- walls and ceilings—follow Method W244 or B415.

NOTE: Any penetration of the membrane should be sealed with appropriate sealant before installing tile.

brane (liquid or sheet). Membranes located behind the backerboard will allow steam vapor to enter the wall cavity.

I suggest that you obtain a copy of the *TCA Handbook* (864/646-8453, www.tileusa.com) for details on steam showers and other ceramic tile installations. In the meantime, see the illustration on page previous page.

Blueprint Abbreviations

Q. *Where can I find a key to architectural abbreviations used on blueprints?*

A. *Corresponding editor Paul Fisette responds:* One good online source of abbreviations is www.triton.cc.il.us/faculty/fheitzman/abbrev.html. A couple of books that have good lists of abbreviations are: *Architectural Drawing and Light Construction* by Edward J. Muller (Prentice-Hall) and *The Professional Practice of Architectural Working Drawings* by Osamu A. Wakita and Richard M. Linde (John Wiley).

As far as I have been able to determine, there is no "official" set of architectural abbreviations in this country. The American Institute of Architecture (AIA) librarian tells me that the institute does not advocate a set of abbreviations. There seems to be wide variation in those used by architects. For clarity, it is a good practice for abbreviations to be defined at the front of each set of architectural drawings.

Asphalt Felt Under Vinyl Siding

Q. *Can asphalt felt be used directly under vinyl siding? I have heard that the two products are incompatible.*

A. *Bob Werner, applications sales specialist at CertainTeed Corp., responds:* The installation of asphalt felt as a weather barrier under vinyl siding has been common for years and is approved by the Vinyl Siding Institute's installation guide. I have never heard of any compatibility problems between the two products. During my years as an installer, going back to the late 1970s, I installed vinyl siding over asphalt felt on at least 400 houses and have never heard of any problems arising from the use of felt under vinyl.

Nailing Sheathing on Valley Roof Trusses

Q. *We're framing a gable-roofed house with roof trusses. The roof includes a bumpout with a smaller gable roof that intersects the main roof, forming two valleys. A valley set will be installed on top of the main roof sheathing. The sheathing along the valley doesn't have blocking for continuous nailing, and I'd rather not nail sheathing to sheathing. Should I install blocking between the framing members of the valley set to provide better nailing?*

A. *Don Richardson, president of the U.S. Division of Romaro Structures, a truss manufacturer, responds:* Installing blocking is not necessary, since the sheathing in a valley doesn't need to be nailed between framing members. The same situation occurs at a ridge; although a truss roof, unlike a conventionally framed roof, has no ridge board, no blocking is necessary at the ridge. Contractors who feel more comfortable with blocking can always install it, but it is unnecessary.

Excavating in Frozen Ground

Q. *What's the most cost-effective way to thaw a site for excavation? We are building a 16x24-foot addition with a crawlspace underneath, and the frost is already 12 inches deep.*

A. *Jay Meunier, a contracting specialist at S.T. Griswold and Co., a ready-mix supplier in Williston, Vt., responds:* If your excavation contractor is not equipped to tackle 12 inches of frost, the next best alternative, other than waiting until spring, is to use a ground heater. The rental fee can be somewhat expensive — about $900 per day in our area — but ground heaters can remove a lot of frost in 24 hours over a 1,500-square-foot area. These units come with a glycol tank and tubing that is laid on the frozen ground with 12 to 24 inches between tubing runs. The area is then covered with poly and insulating blankets that force the heat from the warm glycol and ground moisture downward, thus thawing the area.

In loamy and sandy soils, it's common to thaw 12 inches of frozen ground within 24 hours. Clay and gravel tend to take longer, but I've been told that you can speed the process by spraying water on the area before spreading the poly and blankets.

Copper Pipes and Armored Cable

Q. *If a copper water pipe is in contact with the metal sheathing of BX cable, can that contact cause the cable to corrode?*

A. *Corresponding editor Paul Fisette responds:* Yes. The flexible sheathing on BX or AC (armored cable) is made of aluminum or galvanized steel, and contact with a copper water pipe can cause it to corrode over time.

Galvanic corrosion occurs when dissimilar metals are placed close together in the presence of an electrolyte like water. In this case, condensation on the pipe functions as the electrolyte. The zinc coating or aluminum (anode) is sacrificed to the copper (cathode), which remains intact.

There is perhaps a more important concern than corrosion: Such contact can be dangerous. The metal sheathing on the cable functions as the exclusive grounding path for the wire. In case of a short or ground fault, a pipe touching the cable could be charged and become a hazard.

Cellular PVC Pipe

Q. *What is cellular-core PVC pipe? Is it as strong as solid PVC pipe?*

A. *Julius Ballanco, P.E., president of J.B. Engineering and Code Consulting in Munster, Ind., responds:* Unlike solid PVC pipe, cellular-core PVC pipe is a co-extruded product with at least three different layers. The inside and outside walls are solid PVC, while the inner core is cellular (or foamed) PVC, a material that includes tiny bubbles of entrained air. Cellular-core PVC pipe is available in various wall thicknesses, including Schedule 40 pipe for DWV and thin-wall sewer-grade pipe. For pipe manufacturers, the main advantage of cellular-core PVC is lower cost, since it requires less resin to make than solid pipe.

The model plumbing codes permit the use of either solid-wall PVC or cellular-core PVC pipe in residential plumbing systems. However, cellular-core PVC pipe is not as stiff as solid PVC pipe. At 5% deflection, a 4-inch cellular-core PVC pipe has a minimum pipe stiffness of 200 pounds-force per square inch, while a 4-inch solid-wall PVC pipe has a minimum pipe stiffness of 310 pounds-force per square inch.

Drilling Holes in Wood I-Joists

Q. *I need to run wires through Boise Cascade I-joists. The joists come with prepunched holes, but the holes don't line up. I'd like to drill some 1-inch holes in the joist webs. Are there any limitations on where these holes can be drilled?*

A. *Kevin Pelletier, sales representative for Wood Structures Inc., a Boise Cascade distributor in Biddeford, Maine, responds:* A hole up to 1 1/2 inches in diameter can be drilled anywhere in the web of a BCI joist, as long as it is located at a distance equal to at least two diameters away from any other hole. In other words, a 1-inch hole needs to be at least 2 inches away from any other hole.

Drooling Drip-Edge

Q. *Most of the houses we build have 12/12 roofs with plumb fascias. Even though our roofer uses drip-edge, water still sometimes drools down the fascias. What are we doing wrong?*

A. *Architect and roofing consultant Harrison McCampbell responds:* Standard drip-edge profiles include a turned-out bottom lip that directs water away from the fascia. The distance from the end of this lip to the face of the fascia varies, depending on the manufacturer and the style of the drip-edge you are using, from as little as 1/4 inch to as much as 1 inch.

Most drip-edge profiles are successful at directing water away from the fascia during periods of heavy rain. During drizzly weather, though, rainwater is sometimes able to curl under a drip-edge and run down the fascia, especially if the drip-edge has a short lip. One manufacturer selling a drip-edge with an aggressive lip is Lamb & Ritchie of Saugus, Mass. (781/941-2700). Its Positive Rite Flow drip-edge has a lip that projects 1 inch from the fascia. It's available in 30-gauge galvanized, white galvanized, and brown galvanized steel; 26-gauge mill-finish; white and brown aluminum; and 16-ounce copper.

Caulking Siding — or Not?

Q. *When installing cedar clapboard, should gaps between the siding and trim be caulked?*

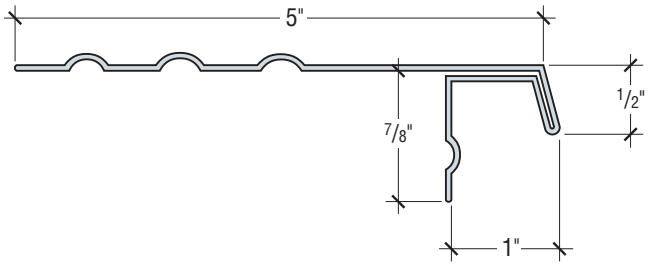
A. *Corresponding editor Paul Fisette responds:* Clapboards should be installed tight against the trim boards, and the joints should be left uncaulked. Omitting the caulk allows any water that penetrates the joint to drain reasonably well and promotes drying.

Although the use of caulk does not cause any disasters, it can elevate the moisture level of the sheathing. I have taken moisture readings of sheathing on many homes, and on average the sheathing underneath caulked corners has a higher moisture content than that under uncaulked corners, and a higher moisture content than the sheathing a couple of feet away from the corner. I recommend that vulnerable areas of the sheathing (like corners) should have a double layer of asphalt felt or housewrap under the trim boards.

Hot southern exposures, wide temperature swings, and wet-dry cycling take a toll on caulked wood joints. In most cases, caulk quickly loses its bond from one of the wood surfaces and leaves a crack where water can enter. Yet even cracked caulk can slow the drying process.

Well-detailed caulk joints require

Rite Flow Drip-Edge



several fussy details. For caulk to work well, the end grain of the clapboards should be painted, to prevent absorption of the caulk solvent. Moreover, a bond breaker (backer rod) should be installed in the gap against the sheathing to avoid three-sided adhesion. This backer rod ensures that the caulk will adhere only to the siding and the trim board, so that the caulk can stretch without tearing.

A caulked joint works best when the gap measures a uniform 1/4 inch. But technical specs for most building sealants indicate that joint movement should not exceed 50%. Since a 6-inch trim board can shrink and swell by 1/4 inch as a result of normal exposure to the elements, you would have to leave a 1/2-inch gap between the trim board and clapboard ends to accommodate 50% movement. Who's going to do that?

Finally, uncaulked joints require less maintenance. Few homeowners have the time to dig out old cracked caulking on a regular basis.

Bolting a Ledger to Brick Veneer

Q. *What's the best way to attach a deck ledger board to a wood-framed house with brick veneer?*

A. *Christopher DeBlois, P.E., an engineer with Palmer Engineering in Chamblee, Ga., responds:* Whenever there is a design alternative, I generally recommend against bolting a deck ledger board to brick veneer. I prefer to provide independent support adjacent to the house, usually with posts and beams. In many cases that is impractical or undesirable, however, so the deck gets bolted to the house.

The brick veneer on a house typically supports its own weight and nothing else. The section of the CABO *One & Two Family Dwelling Code* on lintels states that "masonry veneer shall not support any vertical loads other than the dead load of the veneer above." When independent support is provided against the house to support the deck, standard practice is to bolt through the brick and the band at the house to provide lateral stability for the deck. That way the brick veneer is not forced to carry the weight of the deck, so there is no violation of the lintels section of the CABO code.

Although I'm against bolting the deck ledger to or through the brick veneer, I recognize that it's not an uncommon detail and that building officials often approve it. With that in mind, here are some thoughts if you choose such an approach:

I have heard the direct bolting of a deck ledger to the house through the brick justified by arguing that because the bolts extend to the house band, the band will carry the deck weight. I disagree. With a separation of several inches between the back of the deck band and the face of the house framing, the bolts will bend or rotate before the weight is carried by the house framing. As soon as that starts to happen, the bolts will bear on the brick, and the veneer will be carrying the load. The good news is that in most cases the brick has substantial extra capacity. In fact, the capacity of the bolt-to-brick component of this connection will generally exceed the capacity of the bolt to the deck ledger itself. As a result, the required size and spacing of bolts are no different than for typical wood-to-wood connections (see *Practical Engineering*, 3/96). I strongly recommend bolting all the way through the house band to properly transfer forces pulling the deck away from the house into the framing instead of into the brick. Also, no lag bolts are allowed. And pay careful attention to sealing bolt holes and flashing against the house.

In some situations, requiring brick veneer to support the weight of a deck is a bad idea regardless of what local building officials allow. Do not bolt the deck band to the brick veneer if you suspect that there are no brick ties (all too common on older houses), if the condition of the brick and mortar is questionable, or if the brick ledge or footing supporting the brick veneer is not sound and stable.

Finally, a number of circumstances may warrant contacting a structural engineer for guidance. If there are large openings in the brick (for a bank of full-height windows, for example), stresses in the brick at the sides of these openings may be too high to permit support of deck loads. Similarly, if you need to support the end of a beam instead of just a continuous, uniformly loaded band, special support will be necessary.

Got a question?
Send it to On the House, *JLC*, 186 Allen Brook Ln., Williston, VT 05495; or e-mail to jlc-editorial@hanley-wood.com.