

Pro: Tiles -- More than you thought you wanted to know

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Probably one of the best ways to learn about good and bad building techniques is to work on the renovation or restoration side of the construction picture. Here is where you see the results of everything done before, especially when the results are a failed system. In the world of ceramic, stone and slate tiles there are not a lot of good professional training resources, unless we have inherited the trade from generations of experience. We tend to make a fairly solid base and then lay the tiles with most of our attention on the layout and pattern, that surface that is seen by the client. But when it cracks and/or leaks, that fancy surface is rarely to blame. There is something happening below.

Experience in commercial tile installation, where things are done with more detailed specifications, often on much larger surfaces with greater traffic, has developed some important rules of the trade, particularly around the questions of membranes and expansion joints. Taking a close look at these details can solve many residential installation problems. One simple example: in residential wood frame construction, the junction between two walls in a shower is all so often a problem area with premature cracking of the grout in the corner. It is simply because those two planes, with all the movement in wood frame construction, are very likely to move with respect to each other. If this joint is not sealed with ridged grout, but rather with flexible sealant, the joint could last much longer.

So if we want to create a quality, no call-back job, where would we replace grout with an expansion joint? According to Michael Byrne who has written an incredibly useful book on the subject:

-- Anywhere there is a change in the backing materials, or where tile work meets or abuts perimeter walls, ceilings, curbs, columns, pipes or other penetrations or restraining surfaces.

-- Anywhere tilework passes over control, expansion, seismic, cold, construction or other structural joints.

-- For interior tilework not exposed to direct sunlight or moisture, expansion joints should be located every 24 ft. to 36 ft. in each direction.

-- For exterior tilework, or interior tilework exposed to direct sunlight or moisture, expansion joints should be located every 12 ft. to 16ft. in each direction.

So just what is an expansion joint in a field of tiles? An open slot, a compressible backer and a sealant over the top to look like the grout in the rest of the field of tiles. Durable but hard to use sealants would be silicone, polyurethane, or polysulfide caulks. In most residential installations it is often better to sacrifice a bit of the durability for colour match, using colour match water clean-up caulks like COLOR CAULK.

Yes, that means soft joints around the perimeter of every room (right on the edge of that cove tile), up the corner joint between walls, in the middle of door ways where the tiles go through and anywhere else where something might move.

Now let's look a little deeper and talk about membranes. Am I talking about waterproofing? Yes, but more. You can install isolation membranes to help combat movement of substrate, curing membranes to prevent premature curing of mortar beds, even sound isolation membranes. And sometimes membranes can do several of these tasks at the same time.

Probably of greatest interest to most of us are the waterproofing membranes, and in residential construction we may ask just where do we need them. There are really three categories. In a totally water free environment, no membrane at all is required. In a moist environment but above the water line, like on the wall of a shower, a membrane is needed that is capable of shedding water. Below the water line, like on the shower floor, and as high up as water may be retained, you need a completely waterproof membrane that will protect the substrate from the water that will, I didn't say maybe, I said will penetrate the tile, the grout, the mortar and head for the substrate.

A membrane could be simple building paper or a 4 mil polyethylene sheet on the shower wall, or CPE (chlorinated polyethylene) in the shower pan or even a trowel applied waterproofing membrane to name just a few. Sheet applied membranes are generally adhered to the substrate with thinset mortar and then the same thinset mortar is used over the membrane to attach the tiles. The important point here is to undertake the tile installation with the assumption that water will get past the tile and the grout and head for the substrate where it could cause tile failure. The waterproofing membrane is your guarantee against future damage.

In this article I have been talking about what you need to do, not all the long details as to how to do it. Tile setters with commercial experience may know all of this but may not have ever applied it to residential installations. That is the old story of pay now or pay later and you may want to ask them about expansion joints and membranes. This may be something that you want to spec into future contracts. If you want to read up on the details yourself I highly recommend the book "Setting Tile" by Michael Byrne, Taunton Press. This book finally explained to me the reasons behind the failures I have tried so often to repair and woke me up to the fact that many "patch jobs" are doomed to failure again because underlying causes have not been solved or compensated for.

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