The Commercial Flooring Report

The Musings of a Tile Consultant

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The last two issues of the Commercial Flooring Report (May and June 2010) dealt with floor covering failures relative to the products themselves, installation and specification. In this issue I've asked Dave Gobis, LGM's ceramic tile consultant and expert troubleshooter, to share with us some of the more specific issues dealing with ceramic flooring complaints, problems and failures. This is a category of flooring that very few know much about. I consider Dave the most knowledgeable guy in the business. You'll see by his credentials at the end of his article how true that is.

The Musings of a Tile Consultant

By: Dave Gobis
http://davegobis.com/

Some of you may know me, many will not. I am a former tile contractor who toiled in the tile trade for 28 years with a shop and good size group of hourly employees. When times were good someone with bigger and better ideas came along and bought my company. After that I was fueled by my industry involvement in educational issues and prepared for my next phase in the tile industry which was doing something about the rampant lack of educational opportunities available. I enthusiastically accepted a position offered to me as the Executive Director of the Ceramic Tile Education Foundation. Unfortunately, the Board was less than forthcoming on my job description in particular about the amount of time I would still be on my knees which ended up being another 10 year stretch. During that time I am happy to report we trained thousands of aspiring installers at varying levels of complexity from glue to mortar work. Now, after 38 years my back and knees have rebelled and I left the position to become an industry consultant and trouble shooter. No more knee work, well almost no more anyway. So why share all this personal history with such a large audience in a widely distributed publication? It is an attempt to validate my credibility in sending a message to those who specify, sell and install ceramic tile.

Here is the message "*train your people in all phases of ceramic tile and the installation process before jumping into the deep water". And we'll add, make sure that on every job the tile flooring contractor adheres to the first sentence.*

Decades of experience and answering tens of thousands of phone calls for ceramic flooring problems and questions, still have not prepared me for what I see on jobs today. A floor covering installer does not a tile installer make. Ceramic tile installation is still a skilled trade. The complexities of installing a rigid clay surfacing material unforgiving of movement is not the same as installing carpet, wood, or vinyl, all of which are much more forgiving. Because ceramic tile is rigid and is being installed on slabs that move (they all do!) and wood structures that bend (like all structures by design), the rigid nature of tile requires movement accommodation to avoid shearing. The cement based bonding materials we use for installation are not like spreading adhesive for other floor covering materials nor do they react the same way. Grout is joint filler and also protection and support for the edges of tile as long as it is not mixed up like soup. When using a liquid waterproofing product on ceramic tile floors, the reason for two or more coats is not so the manufacturer can sell more product, it's because that's what it takes to waterproof the surface. These are all messages that seem very hard to convey to those trained in soft floors based on my observations. In preparation for this article I counted how many companies had no mention of tile in their

business name in the 74 projects I was called out to review last year; the number was 59. Typically it is ABC Floors and More or XYZ Floor Covering. Granted, a business name does not in any way define the capabilities of the business but it does lend itself to describing their focus in targeting the market they serve. You are not going to call Tile Concepts to ask about their new wood floor offerings. Further complicating matters are the current economic conditions in the commercial bid market. Everyone is chasing the few dollars available for those flooring projects that do exist. In the commercial bid market ceramic flooring jobs that would typically go begging for a few bids, now get as many as 20 to 25. The economic desperation of the current construction market has made many look at jobs they would normally pass on in even moderately good times due to lack of adequately skilled labor.

All this has been a boom for us as experienced professional consultants and trouble shooters and not just in the flooring industry but across the board in all construction trades. It is further compounded, to some extent, by owners of the completed projects unable to sell or lease their newly constructed units. In summary we have many projects being completed in

THE COMMERCIAL FLOORING REPORT
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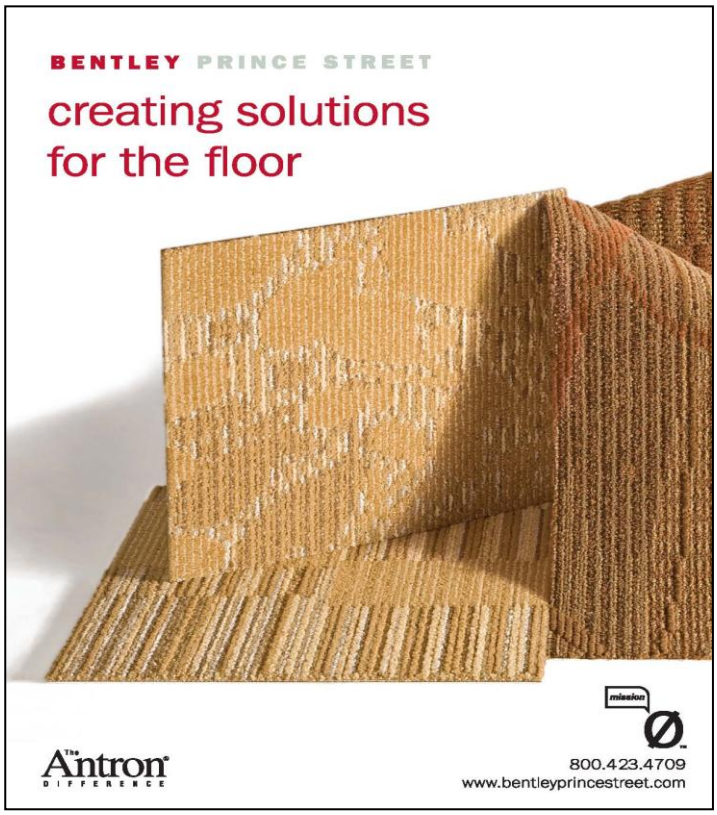
a marginally acceptable manner by those with either minimal skills or lack of economic incentive, to do the job correctly, for owners whose performance expectations are high, doing their part to stimulate the economy even if it is for their own benefit.



This may all sound a little harsh but the current conditions and performance expectations are something we've never seen before. For those of you that dabble in tile, I would like to share with you the top five reasons that ceramic tile installations fail. If you were to ask any other tile professional, the order may vary but I think there would be near universal agreement that four if not all five, are correct. With that said, this is what my experience has been.

Movement Accommodation Joints

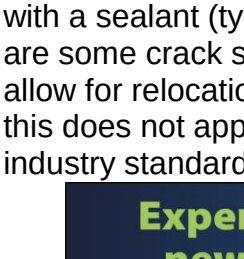
Without question, the single largest cause of ceramic floor failures is lack of movement accommodation joints. There is typically another reason associated with this failure, but not always. Tile grows when exposed to heat or moisture. Concrete slabs contract as they cure. Wood structures are subject to both deflection and seasonal movement associated with changes in humidity. ***All*** building materials move at different rates. The tile industry recommendation for floors is a minimum of ¼" movement accommodation at all wall perimeters and anyplace the tile abuts another rigid surface, and every 20 to 25 feet in the field of the installation. When these guidelines are not followed, tenting (lifting of the tile) is the most noticeable form of failure. Quite often the floor tile will simply shear clean from the thinset and sound hollow.

Surface Preparation

A smooth concrete slab is trouble waiting to happen for ceramic tile installation. Any stress such as lack of movement accommodation joints, allowing for differential movement in building materials, can cause the tile to shear from the setting plane. Regardless of what type of thinset is used, if you have any curing compound, coatings such as paint overspray, dust and dirt, or any foreign substance on the substrate, you are at risk of bond failure. In the real world, finding a slab with no curing compound is very rare. Concrete industry standards recommend none be used if tile is to be applied. If you feel like rolling the dice on your shiny slab with curing compound, you could do a water drop test. Place a few drops of water on the slab, if it absorbs immediately, you're good to go. If it takes a few minutes to absorb then you have to use a better grade of latex/polymer modified thinset. If ten minutes go by and the water is still beaded on the concrete surface, then it means it's time to leave and come back when the surface has been prepared properly to make the installation. I've had four car dealerships with this condition so far this year alone; all required complete replacement.

Bridging Saw Cut Control Joints

A favorite item I heard from concrete guys in my contracting days was, once the control joint is cracked, it is cracked; the control joint has served its purpose and isn't going anywhere. In the real world, all you count on is *it is going to move again.* With rare exception, very rare, you will always find movement in a concrete separation or crack. Control joints are to control shrinkage in concrete slabs, causing the cracks to occur in predetermined areas. There are concrete industry guidelines as to when and where they are to be placed. A qualified person must make this determination, if you're reading this article; you are probably not that person. ***All*** concrete needs control joints, there is no such thing as, we only use them in commercial construction, and we don't do that on residential jobs. If there were no joints on a slab of any size it would be prudent to use a crack suppression membrane over the entire surface. If there are control joints the tile must stop at that joint. A pre-made movement joint can be placed over the joint or an appropriately constructed movement joint made with a sealant (type of caulk) and a backer rod. There are some crack suppression membranes that will allow for relocation of the movement joints however this does not apply to all membranes meeting tile industry standards, in particular liquids.



Low Grout Joints and Shading

Why, pray tell, does one of the most important parts of the installation get left with the low man on the totem pole? To find a decent grout job today is almost a rarity; it is very frustrating. It is actually much less work to do it right than wrong, a fact proven over and over again. Mix the grout to the right consistency, which is on the stiff side and not pourable. Wipe the tile with a damp sponge using clean clear water prior to application. Pack the grout into the joints in a perpendicular motion, passing over the area to be grouted a minimum of three times. Let the joint stiffen which takes 15 to 30 minutes depending on conditions, longer or less is possible. ***DO NOT*** use a fan to accelerate the process, grout needs water to set properly, but that is all it needs water for. Force drying will make the grout soft. Always employ the driest method possible for clean up. Wring out the sponge to as dry a condition as reasonably possible. Make one pass to "shape" the joints and after rinsing the sponge make a few more passes for final cleaning.

Thinset and Coverage

As tile and installation conditions change, using the right thinset has grown increasingly complex. First and foremost thinset mortars are ***NOT*** designed for floor leveling, they lack the compressive strength needed to stay there. Regular thinset mortars have a maximum profile thickness of no more than 3/8 of an inch under the tile. We commonly find thinset built-up ½ inch or higher when we look at floor failures. If a thicker build-up is required use a medium bed mortar. Those types of thinsets typically have a limit of ¾" thickness. Anytime you use a tile over 15 inches in size a medium bed mortar should be used. Getting enough thinset under the tile is absolutely imperative when it comes to bonding ceramic. The industry coverage requirements for tile are 80% equally distributed in interior applications and 95% in exterior or wet applications. Stone and glass tile require specific types of thinset and as close to 100% coverage as possible.

There are many considerations when installing a ceramic tile floor. The above are the most typical issues that we hear about daily. They have not changed much over the years. If you need help educating your workforce or need assistance with a specific project LGM & Associates can be there to help with your ceramic tile needs too.

David M. Gobis, is a third-generation tile setter and Technical Tile Consultant and associate of LGM. Dave has been in the trade for over 35 years and owned a successful contracting business for many years prior to his current position. He's the Author of over 100 trade related articles and a frequent speaker at industry events. He is a member of the Construction Specification Institute, International Code Council, American Concrete Institute, National Tile Contractors Technical Committee, voting member of The American National Standards for Ceramic Tile Installation and Setting Materials (ANSI A108/118), American Society for Testing of Materials (ASTM) C-21 Ceramic Whitewares, and Tile Council of America Installation Handbook committees. You can reach Dave by calling or emailing LGM.

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www.baseking.com/products/envirostix

INTERNATIONAL CONCRETE REPAIR INSTITUTE

Concrete Moisture Testing Technician Certification – Grade I

The International Concrete Repair Institute (ICRI) is pleased to introduce their Concrete Moisture Testing Technician Certification Program. The purpose of this program is to help improve the performance of concrete slab moisture testing in the U.S. to result in more consistent, accurate results that will help flooring manufacturers, architects, and contractors to make better decisions as to when a concrete floor is ready for a floor covering installation.

The certification program has 2 tiers. Tier 1 applicants are those who are not regularly engaged in moisture testing yet have an active interest in learning more about the tests, what the tests mean and how the tests should be performed. Tier 2 applicants are those who have applied for full certification. Both tiers require attendance at a 3 hour educational session followed by a written exam. Tier 2 full certification applicants will also be required to perform each of the 4 tests under the watchful eye of a qualified judge who will not provide any level of coaching. Prequalification for acceptance into full certification Tier 2 will be previous testing experience.

Tier 1 consists of a 3 hour educational session, a written exam and a training session. Those who complete the course and pass the exam will be issued an ICRI Letter of Education. Tier 2 consists of the same 3 hour educational session, the written exam and a field performance exam. By passing both the written and performance exams, an ICRI Concrete Moisture Testing Technician - Grade I certification will be issued to those who successfully demonstrate their knowledge and ability to properly perform and record the results of each of the four field moisture tests on hardened concrete. Those who pass both the written and performance exams will receive a certificate and wallet registration card.

Both the written exam and the field tests will be based on the following four (4) ASTM Standards, including all Annexes and Appendices:

F 710	Preparing Concrete Floors to Receive Resilient Flooring; Section 5.3 pH Testing
F 1869	Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
F2170	Determining Relative Humidity in Concrete Floor Slabs Using *in situ* Probes
F2420	Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood

ICRI Certification for Slab Moisture Testing Technician– Grade I shall be valid for a period of five [5] years from the date of completion of all applicable certification requirements.

The two day certification program begins on the first day with registration from 8 - 9 am, followed by the 3 hour educational session. There will be a provided lunch and study break from 12 – 1 pm followed by the written exam from 1-2 pm. Following the written exam Tier 1 students will attend a training session where they may receive or observe hands on training on how to properly perform each of the four tests.

For those registered for the Tier 2 Certification, day two begins at 8 am, and each applicant will be required to perform all 4 ASTM tests listed above.

ICRI currently has six Slab Moisture Testing Technician Certification programs scheduled in 2010.

Atlanta - June 22-23

Denver - June 29-30

Chicago - September 14-15

Baltimore - October 5-6

San Diego - November 15-16

San Jose - November 18-16

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