Installing a Wood Parquet Floor

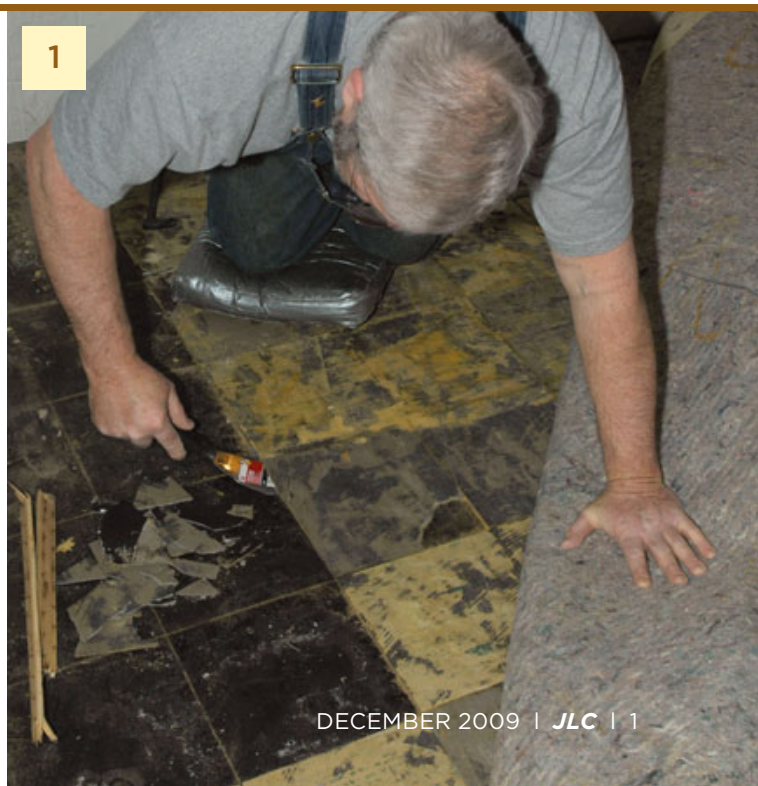
Assessing the moisture content and surface condition of the slab was the critical first step

by Howard Brickman

My beachfront rental unit had a worn-out carpet that needed to be replaced. I decided that a wood parquet floor would look better, be easier to take care of, and make for a fresher, brighter space. The unit sits on a concrete slab mere steps from the water, so the wood flooring would have to be protected against potentially high moisture levels.

With a concrete slab, the two big issues are always moisture and surface condition. I had planned on gluing the parquet directly to the concrete — until, that is, I discovered the 1950s-vintage composition tile and asphalt adhesive under the carpet (1). Asphalt adhesive on concrete is as bad as it gets; it's best to hire a professional to do the removal or to cover the mess with plywood. I opted for plywood.

With wood flooring, an uneven subfloor will cause variations in the finished surface, but those variations won't be noticeable if they're gradual enough. The wood-flooring industry standard for subfloors is a gradual change of no more than 3/16 inch along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the length of an 8-foot straightedge. If you're laying plywood underlayment over concrete, the concrete needs to be leveled or variations will telescope through the plywood.

I would normally use a planetary grinder (a concrete grinding machine with counter-rotating disks) to grind down the high spots. However, I prefer not to grind old floor coverings because they may contain asbestos. Instead, I filled in the low spots with 15-pound felt, folded to the depth needed at each spot.

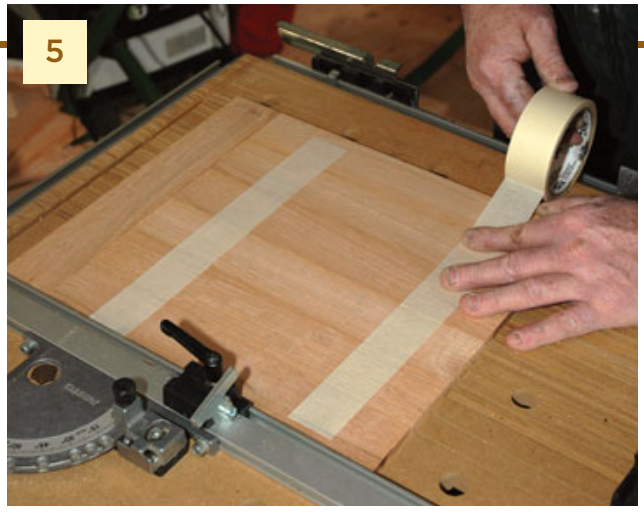
Dealing With Moisture

The next step was to measure the slab's internal relative humidity (RH). The rule of thumb when measuring slab moisture is to drill at least three holes for the first 1,000 square feet of floor, then an extra hole for each additional 1,000 square feet. The holes should be drilled where you expect the most moisture to accumulate — near a doorway where rain might blow in, near a plumbing wall, or wherever you observe leaks. In a standard slab-on-grade, the hole depths should be 40 percent of the slab thickness.

I measured the RH with a moisture meter I developed for my own work and sell to the trade. Its 3/8-inch-diameter sleeve fits in a 7/16-inch hole and has electronic sensors for measuring temperature and RH. Unlike the sleeve on other meters, this one isn't wrapped in plastic, so I can get a much quicker reading once the test holes are prepared — a real plus when doing a floor under schedule pressure. After drilling each hole and vacuuming out the debris **(2)**, I taped over the hole with an impermeable packing tape and let it sit for 24 hours so that the readings would reflect conditions in the slab rather than in the room.

If the internal RH is 75 percent or less, you technically don't need a moisture barrier, but I always use one anyway, just for insurance. Since this particular slab is directly on grade, within 100 feet of the ocean, and only 3 to 4 feet above sea level, there was no question that I would use one. The moisture test indicated a moisture content well over 80 percent, so that sealed the deal **(3)**.

If I had been gluing the parquet to the concrete, I would have applied a brush-on moisture barrier directly to the concrete. But



first I would have done an absorption test, which involves putting drops of water on the concrete. If the water beads up instead of spreading out, the surface is not absorptive enough, and I'd need to use a grinder to remove the sealer from the surface, then retest.

For this job, though, I laid down a 6-mil polyethylene vapor barrier, then covered it with 1/2-inch CDX plywood, fastening the plywood to the floor with 1 1/2-inch concrete nails to provide 1 inch of penetration **(4)**. I used 1/2-inch plywood — rather than 1/4-inch or 3/8-inch — because it was stiff enough to need just a nail every square foot (for a total of 32 nails per sheet). The thicker, stiffer plywood also bridges over minor surface imperfections.

Floor Layout

I installed the plywood at a slight angle to the room's walls to ensure that no lines in the parquet floor would be parallel to any lines in the subfloor. That way, expansion or contraction of the plywood won't open up gaps in the floor pattern.

The finished floor would be 12-inch-by-12-inch parquet squares made from 5/16-inch-thick by 2-inch-wide strips of white oak. Each square consisted of six strips laid side-by-side and held together with two pieces of masking tape **(5)**. Because the flooring would be held in place by adhesive, I only needed to keep the parquet squares assembled long enough to get them in place. Working at the site, I used my Festool saw to cut the strips to length; it doesn't splinter, makes near perfect cuts, and can be connected to a dust-collection vac **(6)**.

I began the layout by determining the room's focal points. In this room I wanted the flooring to be parallel to the longest wall, so I snapped a line 24 3/8 inches away from that wall (two squares plus a 3/8-inch expansion gap), then snapped a second line perpendicular to the first and the same distance away from the adjoining wall **(7, 8)**.

The adhesive has to be spread on a clean, dry surface. Had this been old plywood I would have given it a light sanding, but since it was new, vacuuming was enough.

Installing the Parquet

The adhesive, filler, stain, and finish used on this floor are all made by Bona. (I always avoid using products from different manufacturers on the same job; they may not work well together and it will typically void the warranty.) We used an adhesive that allows the floor to be wet-laid (older adhesives had to be left to dry for a bit before the floor was put down), and we spread out only as much as we could reach over — about 30 to 36 inches at a time. If you have a two-man crew, one person can spread and the other can place the flooring.

Using a notched trowel **(9)** ensures that the right amount of adhesive gets spread out on the sur-

face. I laid the squares on the adhesive **(10)** and pressed them firmly in place **(11, 12)**, starting at the layout lines and working across the floor toward the opposite corner. So that I didn't trap myself in the corner, I left an unfinished strip at each wall. This allowed me to work my way from the back wall and eventually out the door without having to step on the freshly laid flooring.

It's a good idea to occasionally lift a tile after pressing it into the adhesive, just to make sure that the adhesive is covering the entire bottom. If it isn't, that means the adhesive surface has started to skim over. You're getting too far ahead of yourself and need to spread less adhesive before laying the tiles.

When laying parquet, I continually sight down the lines to make sure they are running straight. Since there will be minor imperfections in the blocks, you need to be able to make adjustments as you go. Leaving very small spaces between the blocks provides enough wiggle room to make these adjustments. The gaps can be filled later. It's also important to periodically confirm that the diagonals are aligning. It's best to use a string for this so you don't disturb the surface.

I left a 3/8-inch expansion gap between the floor and all walls. Anything bigger wouldn't have been covered by the 1/2-inch-thick baseboard. Besides, if a wood floor swells enough to push the perimeter more than 1/4 inch, the adhesive is going to fail. Even a fairly elastic adhesive — like the one I used here — can't stretch more than 1/16 inch.

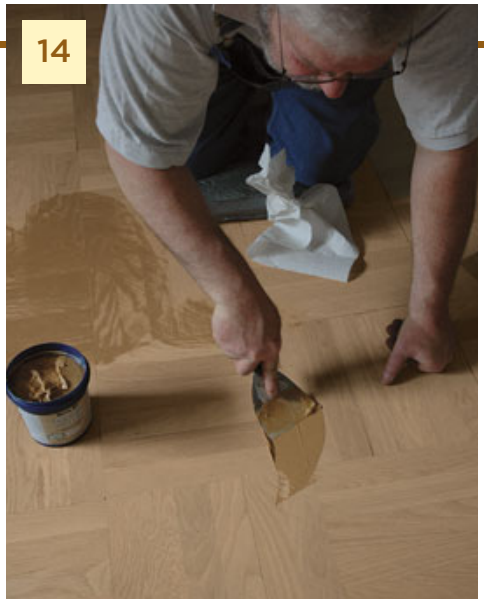
Once all the parquet squares were installed, I gave the adhesive time to dry by letting the floor sit overnight.

Filling and Sanding

With the adhesive dry, the next order of business was to fill any gaps between the squares **(13)**. I used a Bona filler made specifically for filling unfinished white oak floors; it's porous enough to absorb stain. It also dries quickly, so after I pushed it into the cracks with a flat trowel **(14)**, I could immediately start sanding.

I sanded most of the floor with a 200-pound Bona professional-grade sanding machine. It connects via a hose to a large vacuum with a HEPA filter, which makes for a dust-free job. I started with coarse grits and worked to fine.

Sanding parquet is different from sanding strip flooring. The wood grain in adjacent parquet squares runs in opposing directions, so if you sand along the layout lines you will be sanding half the squares with the grain and half against it. This can leave



perpendicular scratch marks that show up through the finish. To prevent this, parquet is typically sanded at a 45-degree angle to the layout lines **(15)**. As usual, I sanded the perimeter of the floor with an edging machine **(16)**.

After the sanding was complete, I used a floor buffer fitted with a double-sided paper disk to blend the sanding patterns together. There are two advantages to using a double-sided disk: It's stiffer than a single-sided disk, so it does a more even sanding job; and the abrasive on the back creates friction between the disk and the fiber pad on the buffer, preventing the disk from slipping around. Which grit to use depends on the depth of the scratches left by the big machine. Here, I did one pass with an 80-grit disk, then finished up with 120-grit. I used a random orbit sander with the same grits around the perimeter of the room.

Applying Stain and Finish

I use a fast-drying stain — Bona DryFast — that's made for wood floors and doesn't leave lap marks like other stains can. A lot of guys apply stain with rags, but I don't like crawling around on my hands and knees; instead, I used a technique here that I've relied on for years with great success. I cut a piece of carpet to fit the disk on the buffer, poured some stain on the carpet pad **(17)**, then used the buffer to spread the stain out on the floor **(18)**. It's faster, quicker, and uses less stain than the rag method.

Whatever method you choose, don't pour stain directly on the floor. It can accumulate in small gaps in the wood, where it can't easily dry, then bleed back onto the surface overnight and mar the drying finish.

To stain up against the walls and in spots where the buffer

wouldn't fit, I used an applicator wrapped in a rag **(19)**. I stood on a couple of pieces of carpet so I wouldn't leave footprints in the stain — or track stain everywhere else. Then I put a dry carpet pad on the machine and buffed the entire floor to remove any excess.

Although the stain dries in three to four hours, I let it sit overnight just to be sure. Then I tacked the surface with a special microfiber dry-tack cloth made for use on floors — its stickiness is provided by the structure of the fiber, so it doesn't add any chemicals to the floor.

I topped the stain with Bona's Naturale, a two-part water-based finish **(20)**, being careful not to mix more than I could use in two and a half to three hours. The finish has to sit for 15 minutes before it's used. Bona provides a strainer you insert into the opening of the finish container to remove any small globs that slough off the interior of the container.

I poured the finish on the floor in long, straight lines, then spread it with a roller specifically made for floors. The roller has plastic disks on each end — I call them training wheels — that ensure a consistent finish thickness **(21)**. The finish works best if used at the recommended coverage rate of 300 to 400 square feet per gallon, and the roller helps ensure this coverage. When rolling, I overlapped the last line a bit to make sure the finish blended together. We cut in around the perimeter with a 10-inch-wide Padco paint applicator attached to a wooden handle. As with any finish application, I needed to maintain a wet edge to prevent lap marks when the finish dried, which made it important not to cut in the edges too far ahead of the roller **(22)**.

The label on the can of stain says to use two coats, but I prefer three. I generally wait a minimum of four to six hours between coats, which means I can put one on early in the morning and then come back later the same day for the second. Because this is a water-based finish, low temperatures and high RH can extend the wait time between coats.

By the way, the trick to working with this particular kind of finish is to not watch it dry. It won't look right an hour or two after application, but it's self-leveling and will level itself out nicely over the course of the drying period.

The final coat also needs a minimum of 24 hours before being walked on. If possible, wait seven days before putting down any rugs, as they'll restrict airflow and keep the finish from drying properly. If you must put furniture down, do so extremely carefully, without dragging it across the floor.

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