

Slabs and Wood Flooring

by Mickey Moore

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These high concrete nails were present throughout this room. The flooring was loose and noisy. This floor had to be taken up and new flooring installed after the nails were cut down.

Some years back we talked about installing wood flooring on concrete. We reviewed the basics that the slab should be—Clean, Dry, Flat, and Sound. The requirement continues even today, there is no “magic bullet” that allows us to ignore this. These conditions also require that someone personally check the site. How many times is the installation crew sent out and the site has not been checked by management? I continue to review issues about wood flooring installed on slabs that show many did not get the story the first time. Hopefully, readership has increased so the directive can be made to more people. Let’s review the four principles.

The slab must be CLEAN. For a direct “glue down” system this means scrape the slab of topical debris. Sheet rock joint compound; other construction adhesives; paint spills, grout and thin-set; old adhesive such as cut-back and chlorinated solvent; are some examples of materials that MUST be removed. In addition, fasteners such as bolts, concrete pins, etc. must be cutoff at slab level. I frequently hear of installations that have failed because the “old adhesive” wasn’t removed. Be aware that when considering removing some old “cut back” adhesive, asbestos may be involved. Additionally, concrete sealers can interfere with proper adhesion. Check to see that a sealer is not present. Place some water droplets on the slab and check to see if the water soaks in. If the water remains after 30 minutes or so there is likely a sealer present. Abrading the slab or bead blasting is a way to remove the sealer. As always, check with the adhesive manufacturer for their recommendation.

The removal of cut-back can be tricky so an optional installation using NOFMA certified solid wood and proper subflooring for a nail down floor can overlay and avoid disturbing the cut-back. The installation of nail down flooring is not as critical with the CLEAN issue as glue down flooring. You just don’t want “globes of stuff” interfering with the flatness of the flooring system. So removal of major debris is the main requirement.



A proper vapor retarder for solid wood on a slab is always required. In a potentially wet environment, use this system of asphalt mastic and 6-mil poly.



Note the puddle, the downspout; flooring that had buckled along this wall had been removed.



The trench for mechanicals supplied water under the slab all the way to the powder room. Flooring that had buckled in the hallway was removed.

The slab must be DRY. NOFMA recommends not to consider wood flooring installation until the slab is at least 60 days old. This does not mean its OK to install at 60 days. The slab **MUST** be checked for moisture. Again, someone must visit the site to do this.

By now we should know the basic moisture tests listed in most installation literature for moisture: poly film test, phenolphthalein test, calcium chloride test, and or a concrete moisture meter. All these tests, which we should know how to do, rely on previously establishing normal environmental conditions. A false positive can result if the environmental condition is not close to normal. The newest test is to record the relative humidity within the slab. This requires drilling an appropriately sized hole for a RH probe. The probe is then read after a required waiting period. This test does not rely on the environment above the slab thus recording moisture present within the slab. A reading above 75 percent is considered too high for wood flooring installation.



A nearly 1/2 inch depression along the wall in about 4 feet. The flooring and subflooring would move when walked on.



The contractors are placing solid shims under the sleepers to make the floor flat. This prevented a potential problem.

Even if the slab is dry but the environment is not at or near occupancy conditions, installed flooring can adversely react to unusual conditions. Again, a site check can identify potential problems, such as standing water or the potential around the on-grade slab, the exterior door that is not properly caulked, or the cracked slab that allows water intrusion.

The slab must be FLAT. Again, the NOFMA literature as well as others' instructions generally are in agreement that the slab be flat to 3/16 inch in 10 feet for direct glue down application and within 1/4 inch in 10 feet for mechanically fastened flooring.

This means the slab must be made flat to these conditions, no "ifs, ands, or buts."

And the slab must be SOUND. For glue down flooring the surface must be strong enough to not fracture under stresses created by the adhesive bond and the flooring. Typically the slab must develop a minimum strength of 3,000 p.s.i. The surface should not flake or be "dusty", which results in an inadequate adhesive bond. And there should not be cracks through the slab that can allow water intrusion.

With mechanically fastened flooring the through slab cracks are the main issue, they can be an active water source. A dusty or flaky slab can be covered over with the appropriate vapor retarder and subflooring and not create a performance issue.

The general rules:

- Check the site, is it ready, and determine what has to be done to make it ready.
- Engineered flooring can be installed at all grade levels.
- Solid wood is not to be installed on a below grade slab only on grade or above grade.
- Use a proper subfloor with mechanically fastened solid wood flooring, generally $\frac{3}{4}$ -inch-thick plywood.
- All solid wood floors over a slab that is in contact with the earth require an active vapor retarder over the slab such as 6-mil poly or equivalent.
- Solid wood flooring can be glued to a slab per NOFMA's technical publication, "Installing NOFMA-certified solid wood flooring directly to a slab using a wood flooring adhesive."
- With any direct glue-down floor, engineered or solid wood, always follow the adhesive manufacturer's directions.

All together now—CLEAN!—DRY!—FLAT!—SOUND!

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