LEAKPROOF SHOWER PANS

WITH A PLASTIC LINER AND ATTENTION TO DETAIL, THERE'S NO EXCUSE FOR A LEAKY SHOWER FLOOR

by Scott Duncan

Considering the damage they do over time if they fail, it's amazing how little architects, general contractors, and homeowners know about shower pans. Anyone who has worked in remodeling has seen the damage. The leaks usually start very slowly and continue to get worse, often going undetected for a number of years. In that time, the water can cause thousands of dollars worth of damage. Subflooring, joists, girders, even exterior siding can be completely rotted away.

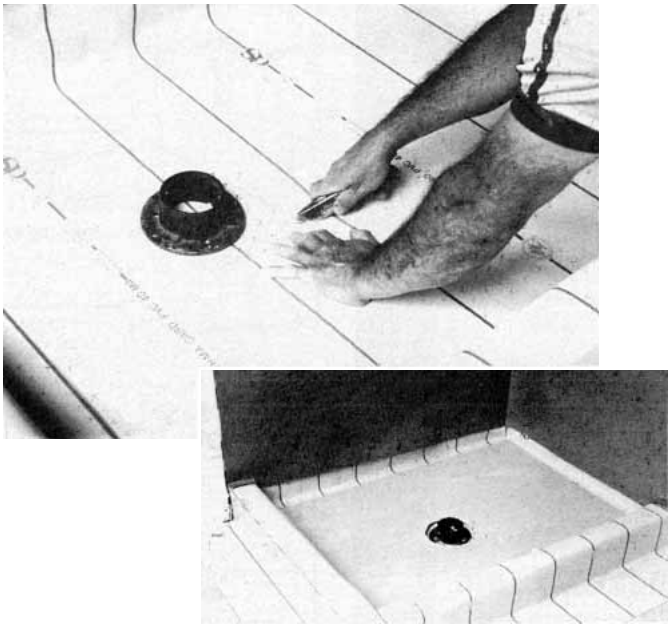
One of the reasons that pans get so little attention is that lots of people assume a good tile job is completely waterproof. Most aren't. It depends on the width of the grout joints, and the type of tile, grout, grout additives, reinforcing wire, attachment, and tile backing used. That's why any tile subjected to a lot of water, especially in a horizontal application like a shower floor, must have a waterproof liner beneath it.

Years ago, most pans were metal; they had sides and soldered corners, and looked like pans. These days, shower pans are also made of hot-mopped felt, fiberglass, elastomeric coatings, and several kinds of plastic fabrics. I've tried most of them, but I think plastic membranes offer the greatest longevity with very few disadvantages.

Plastic Pans

In the Pacific Northwest where I worked for a number of years, plastic pans are about all you see. Although they haven't been around as long as metal or hot-mopped pans, I've never seen a problem with one that wasn't the result of poor installation. They are generally considered to have a life expectancy in the 50-year range, and I suspect they'll last a lifetime.

There are other reasons to use plastic. Unlike metal or hot-mopped pans, there's just one sub to deal with: the tile setter. This eliminates the scheduling hassles of getting a metal pan made up and installed, or making sure the hot mopper gets to the job when he's supposed to. It also keeps the tile contractors happy because they have complete control over the quality of the work that goes into the pan, and they get to take home the profit from the pan installation.



A careful cut in this PVC membrane exposes the lower part of the drain assembly, allowing the upper flange to be bolted on. The completed pan (inset) is ready for mortar bed and tile.

There are two basic types of plastic shower pan membranes: *CPE,* which stands for chlorinated polyethylene, and *PVC,* or polyvinyl chloride. With either material, you should make sure that your tile setter is using the 40-mil (not the 30- or 20-mil) version, not only because it is more difficult to puncture, but also because codes often call for this thickness.

The brand of CPE membrane I use is called *Chloraloy* (made by the Noble Co., 614 Monroe St., Box 332, Grand Haven, MI 49417; 616/842-7844). The Noble Company was one of the first to manufacture a plastic pan material, and they did it right. It uses a fusion cement for seams that makes them as strong as the material itself, and preformed inside and outside corners are available to help at intersections. Chloraloy is guaranteed for 50 years, and claims superiority over PVC because it is less susceptible to microorganism growth (although I've never heard of a case of either PVC or CPE deteriorating).

There are a couple of disadvantages to Chloraloy: price and workability. Even though the material is the standard 40 mils thick, it works more like it's 60 mils. When it's less than 60°F, Chloraloy loses some of its flexibility, and a hot air gun is helpful in folding corners.

As for PVC products, there are a number of manufacturers of shower pan membranes. Compotite Corp. (Box 26188, Los Angeles, CA 90026; 800/221-1056) and Pasco Specialty & Manufacturing (11156 Wright Rd., Linwood, CA 90262; 310/537-7782) both make good liners, but my current favorite in the PVC category is made by Dallas Specialty & Manufacturing Company (1161 Ruggles, Grand Prairie, TX 75050; 800/222-5644). Like other plastic liner manufacturers, Dallas Specialty uses a proprietary cement to fuse folds and seams,

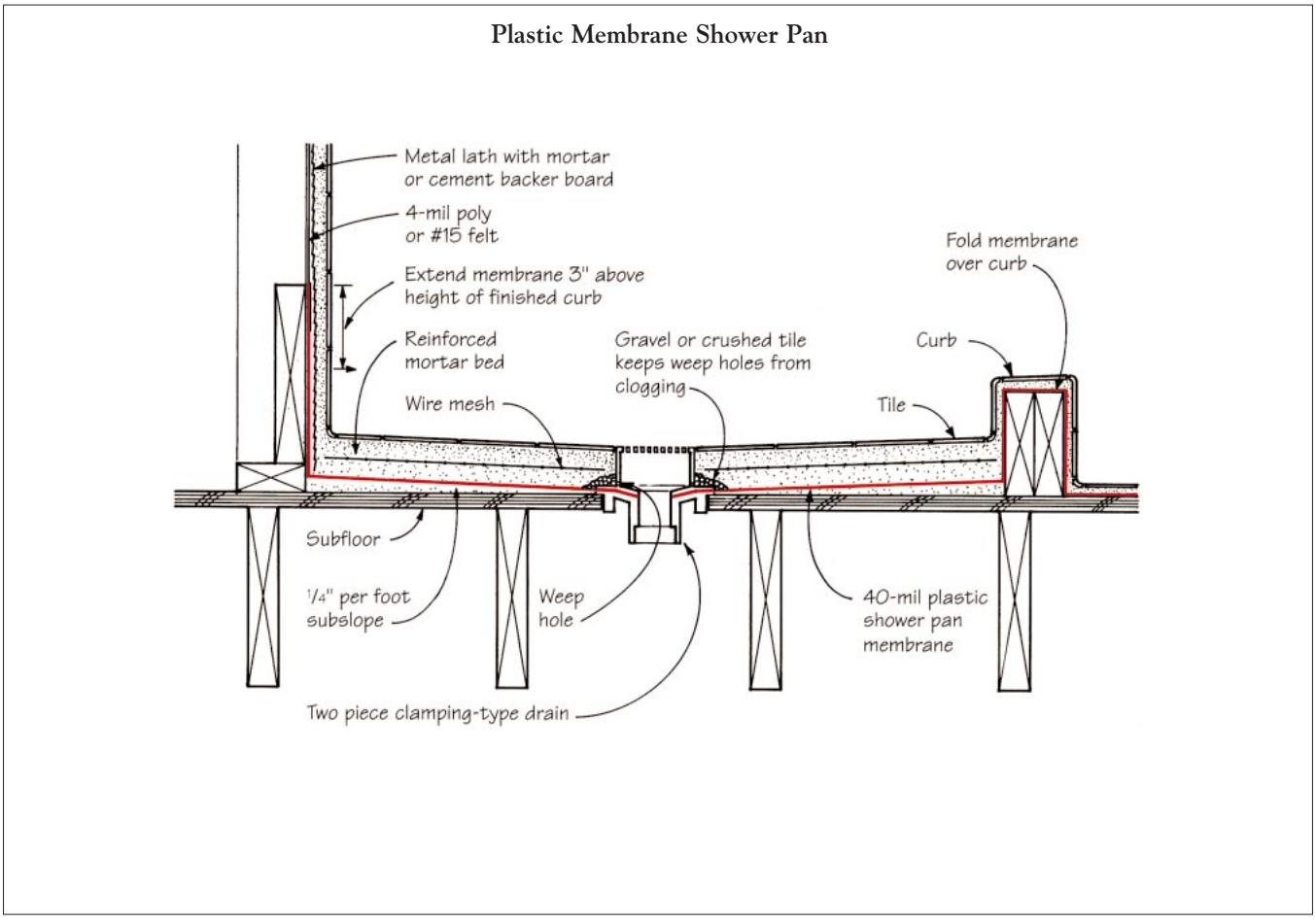


Figure 1. *In a typical tiled shower, the pan liner extends above the curb height on walls and is sealed in place by the two-part subdrain assembly. Any moisture that penetrates the tile floor and accumulates will exit through weep holes.*

and they sell preformed corners.

This liner is more pliable than Chloraloy and a good deal cheaper. It runs a little more than 50¢ a square foot; less than one third the price of Chloraloy. You also have a choice of 5- or 6-foot widths. A 5-foot-wide roll works fine for a standard 3x3-foot shower, but on oversized showers, the extra foot often saves me the considerable time required to seam the material.

Another nice bonus with this product is that it has been tested by most of the pertinent building code agencies and has the approvals stamped right on the pan material. This can make a difference to building inspectors who normally want backup literature if they aren't familiar with the product you're using. Dallas Specialty also makes a nice drain that is adjustable in height and can be fused to the pan material.

Prep

The shower pan works in tandem with the drain by carrying to it any water that has gotten through the tile floor. That's why shower pans need to be sloped and need a drain with weep holes. Sounds simple, but at one point a number of years ago tiled showers were almost written out of the codes because their flat floors and sealed drains created what is called a *concealed fouling space*. Translated, that means that the standing water in this space is a fertile environment for decay-producing microorganisms, as well as acids and salts.

The drain you need is the two-piece clamping-type, sometimes referred to as a subdrain assembly. The plastic liner clamps between the two pieces of the drain, which is held tightly by three bolts (see Figure 1, facing page). The weep holes are in the top flange between the bolt heads.

A shower pan must have at least a 1/4-inch-per-foot slope to the weep holes (see Figure 2). In my area the general contractor is responsible for this sloped floor, which is usually built by a carpenter on the job using shims and plywood over the existing subfloor. If I'm doing it myself, I use a dry mix of sand and cement, about 4:1, to get the proper slope. Unfortunately this usually means an extra trip to the site because the mortar has to set up before I can put the pan on it.

Another requirement for the shower bottom (metal pans are the exception) is continuous blocking between the studs to a height of 4 inches above the rough curb. In my area 2x10s or 2x12s are commonly used, nailed flush between the studs.

This works out well when the wall tile is laid on mortar (as I hope it is). The vapor barrier and reinforcing wire overlap the pan at least 2 inches, and then everything ends up in the same plane. But with cement backerboard or (heaven forbid) drywall, the studs must be notched or the sheet material furred out to keep everything flat.

Installing the Pan

Plastic pan materials come in rolls of 50, 100, and 200 feet, and can be laid out and cut on any flat surface where there are no sharp projections.

The pan should run up the wall at least 3 inches above the height of the finished curb; this typically means allowing 9 to 10 inches of material on each wall. The membrane should also wrap around any jambs and fasten on the outside of them. The same is true of the rough threshold.

If a seam is required, it needs to be done carefully. Following the manufacturer's directions, your tile setter will coat both sides of the seam with bonding cement and create at least a 2-inch overlap. Seams should be pressed together firmly with a seam roller. Drying times vary for different materials, but I err on the cautious side when I can by letting them dry overnight.

Before draping the pan loosely in place (see Figure 3), it's important to sweep the shower floor well and check for anything that could puncture the membrane. With a wood subfloor, I also like to round off the drain cutout with my utility knife to make sure it's smooth, and I always check the two parts of the drain to see if they mate cleanly. I file off any little bumps of metal left over from the casting process, since they could interfere with a good seal.

The easiest way to attach the liner to the surrounding framing is with a staple gun. Make sure the staples are in the top inch of the material (or at least one inch above the height of the finished

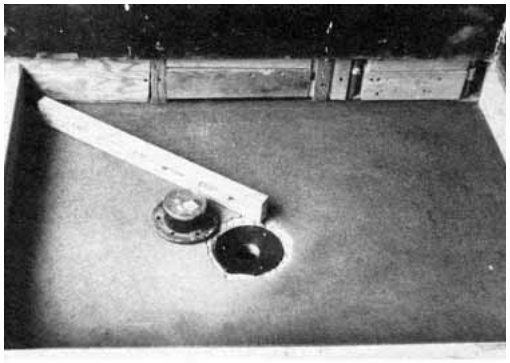


Figure 2. *The author used a dry mortar mix to create the slope to the drain in this shower. The two parts of the drain assembly are shown here. The weep holes are visible on the top part of the bolting flange, at left.*

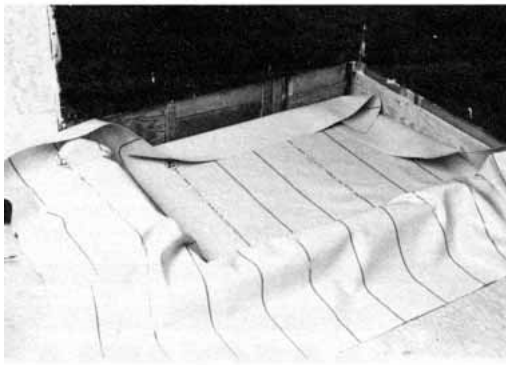


Figure 3. *Having cut the PVC liner to size, the author will smooth it into the corners and staple it to the studs and blocking. The staples must be at least one inch higher than the finish curb.*

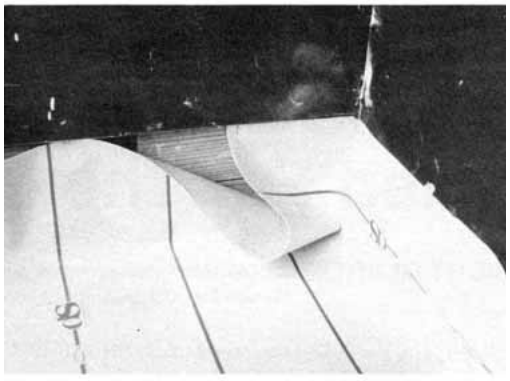
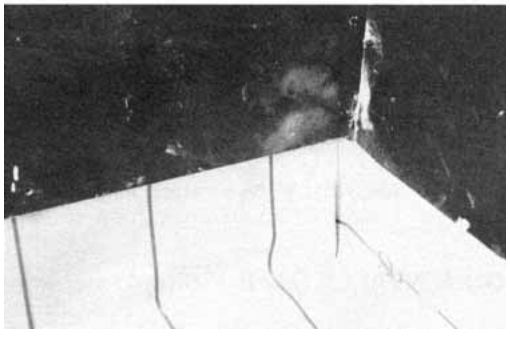


Figure 4. *Inside corners require a fold known as a "pigs ear" (left). Use solvent to keep the fold tight to the wall (below).*



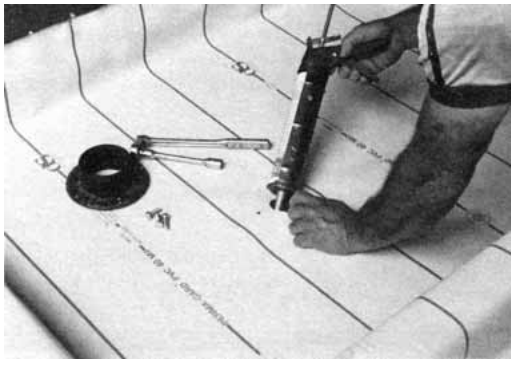


Figure 5. *Using a small access hole cut at the drain throat, the author caulks the base flange of the drain before bolting down the top half. Once the pan is water tested, he will pack gravel around the drain to keep the weep holes from clogging up with mortar when the floor is floated.*

curb).

Corners take time. Inside corners require a fold sometimes described as a "pig's ear" (see Figure 4). The bonding fluid helps the folds lay flat. Outside corners, like you find on an L-shaped shower, are the most difficult. They have to be done in place and require several patches and lots of solvent.

I install the drain last. I cut a small hole in the pan over the center of the drain so that I can put a bead of butyl caulk between the bottom flange of the drain and the underside of the plastic pan (see Figure 5). At least one membrane manufacturer claims this isn't necessary, but I have seen showers leak due to a poor seal here. It's important *not* to trim out for the bolt holes, but just to pierce the membrane slightly at each location. Once the bolts have been pushed through the material, they can be tightened evenly but firmly with a socket wrench.

Finishing Up

Every pan needs to be tested. No tile setter wants to hear that a pan is leaking, but it's better to hear it now than after the tile is in.

The test should be done over the period of a day with enough water to fill the pan at least an inch above the top of the drain. Make sure a test plug is used in the throat of the drain. I've seen tile setters leave the membrane inside the drain intact and use it instead of a drain plug. This ignores the fact that one common place for a pan to leak is between the *bottom* flange and the underside of the membrane.

After the pan tests out, there's one small but important last step before floating in the mortar bed: Protect the weep holes from getting plugged with mortar. Almost anything — gravel, broken tile, a handful of spacers — can be used as a barrier around the drain.

Creating the mortar bed is pretty straightforward, but there are two things that the mortar shouldn't be without. The first is a waterproofing additive (I use a product called *Anti-Hydro*, from Anti-Hydro Company, 265 Badger Ave., Newark, NJ 07108; 201/242-8000). This will reduce the amount of water (up to 85%) absorbed by the mortar bed. This, in turn, reduces the amount of water the shower pan has to deal with. The other thing to look for is reinforcing wire in the bed. It will go a long way toward preventing cracks, and it's another indication that you're getting a quality job. ■

Scott Duncan of Classic Enterprises, in Saratoga, Calif., has been setting tile for 24 years.