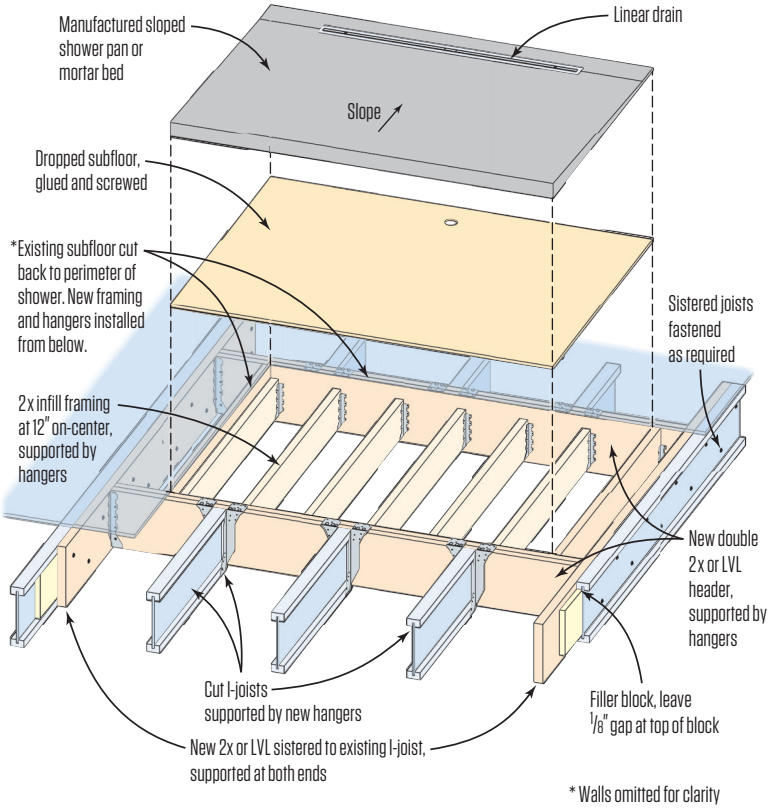
Q I'm retrofitting a curbless shower with a linear drain in an existing home with an I-joist floor. What's the best way to drop the floor for the mortar bed?

A Michael Byrne, veteran tile installer and consultant, and moderator of *JLC*'s ceramic tile online forum, responds: Retrofitting the slope for a tile shower is a common problem for builders. Curbless showers, which have been growing in popularity, present an even greater challenge because of space limitations. A curb allows the slope to be added directly over existing subflooring. But while many people don't mind stepping over a curb to enter the shower, there seem to be just as many who object to stepping up and onto the floor of the shower.

Shower Pan for an I-Joist Floor



DRAIN AT SHOWER ENTRANCE

The first question to ask is where in the shower the linear drain will be placed. If it's located at the entrance to the shower, then no supplemental or retrofit construction is needed to provide slope for a curbless shower floor. In this configuration, readily available manufactured sloping panels can be literally dropped into place, or the slope can be added with a single-plane mortar bed.

Either way, sheet-membrane or liquid-applied waterproofing is required only on the surface. As I see it, the only two concerns for this installation strategy are the potential for waste water to run past the drain and out onto the bathroom floor (which should also be waterproofed regardless of the type of curb or drain) and the need to provide stability for a wheelchair that naturally wants to follow the slope and roll out of the shower.

DRAIN AT BACK OF SHOWER

Sloping the shower floor away from the entrance—from front to back—allows gravity to stabilize a wheelchair against the back wall, but it brings us back to structural issues with wood-framed floors. In these cases I recommend dropping the entire shower area and then using manufactured panels or a mortar bed for the slope.

Creating a dropped area in an I-joist floor means removing sections of I-joists and usually framing the dropped area with dimensional lumber or an LVL type of engineered lumber. The trick is to ensure that the dimensional lumber part of the equation—the part supporting the tile installation—ties into and is at least as strong as the surrounding I-joist floor. Also, the dimensional-lumber part of the floor must comply with the tile industry requirements for deflection: no more than 1/360 of the overall span (uniform load), and no more than 1/360 of the span between joist members (concentrated load).

As a caveat, the simplest way to drop a floor—regardless of the framing—is to have access to the framing from below. Because curbless showers are most often installed for accessibility, and because accessible bathrooms are usually on the first floor, let's assume that the shower you will be installing is on the first floor with an

unfinished basement or crawlspace below. Let's also acknowledge that if this work is being done above a finished space, you most likely will need to remove a large part of the finished ceiling to gain access to both the framing and the plumbing.

I start by cutting out the subfloor in the shower area (see illustration, page 19). From below, add spacer blocks that fit between the flanges of the I-joists just outboard of the hole. These spacer blocks pad out the I-joist webs and need to be installed to manufacturer specs. Next, sister 2-bys or LVL material onto the joists that you padded out. These sistered members should extend back to some type of bearing, such as a carrying beam, post, or foundation wall. (If you're working in a crawlspace it may be possible to add footings and posts to support the framing). Attach the new framing to the padded I-joists with ½-inch bolts at least every 8 inches or so in a staggered pattern.

On both sides of the opening, temporarily support the I-joists that run through, and then cut them short enough to give you room to install headers across the opening with a pair of 2-bys or LVLs on each side. The headers will need to carry the cut I-joists on hangers after they're cut, so mount the I-joist hangers on the headers before slipping them into place, if necessary.

To fill in between the headers, start with a double joist on either side of the opening that consists of a full-height joist to catch the edge of the existing subfloor and a shallower joist at the height of the dropped shower floor. Then it's just a matter of filling in the joists at the dropped height. You may be able to get away with spacing the joists 16 inches on center, but 12-inch spacing will give you a stiffer floor. Finally, glue and screw down at least ⅝-inch-thick subflooring. Then you can add either a manufactured sloped shower pan or a sloped mortar bed with the appropriate waterproofing.

After you install the tile—and I assume the bathroom floor will also be tiled—lay out the tile so that a grout joint lands directly above the junction between the dropped area (where the shower floor begins to slope) and the original I-joist floor. Fill that transition joint with a resilient material such as a silicone or latex sealant.

Q I'm considering pervious concrete for the driveway on an upcoming project. What exactly is pervious concrete? Does it require extra maintenance to keep it functioning?

A Peter Zoni, sales manager at Cape Cod Ready Mix, in Orleans, Mass., responds: Pervious concrete is a mix of Portland cement, coarse aggregate, water, and admixtures. Because there is little or no sand in the mix, the concrete contains bigger voids than ordinary concrete. These voids let water and air pass through, allowing pervious concrete to drain huge amounts of runoff for long periods of time.

Pervious concrete is not a new product, but recently it's been gaining popularity because of its unique properties. First off, it's a great solution to many federal stormwater-management requirements regarding paved surfaces such as driveways. Because water percolates naturally through the material into the water table, using pervious concrete may eliminate the need for water-retention ponds and complex drainage systems, saving all the associated costs of engineering and installation.

Pervious concrete is also strong and durable. Our company has developed a pervious-concrete product, called Perk-Crete, that we recently installed on a 200-foot driveway that runs up a 15-degree slope to a horse farm. The driveway produces zero runoff and is strong enough for any traffic it will see.

Installation of pervious concrete must be done by trained and certified professionals following specific placement guidelines, including those for preparing the base to drain the water that passes through the concrete.

Because of its strength and durability, pervious concrete is resistant to damage from freezing and thawing. It's at risk for freeze-thaw damage only when the voids in the concrete become clogged and water no longer drains through. If this happens, pressure washing or vacuuming may be needed. But anecdotally, I've had a pervious-concrete driveway for years and have never pressure-washed or vacuumed it, and water still drains through it like the day it was installed.