

INSTALLING Precast Garage Slabs



I build about eight custom and spec homes a year, mostly in new residential developments. It's mountainous in Utah, where I live, so we have a lot of sloped sites. This winter I tried out a new product

by Sam Morgan

that works really well on a slope — precast garage slabs.

We were building a spec home on a steep lot in a subdivision. I had built the same plan four times before, and it always sold well. This time was a little different because of the grade: The earlier houses happened to be on flat lots, but this lot dropped off 12 to 14 feet from the front to the back. The back wall of the basement needed a 4-foot-high foundation wall just to get up to floor level in the basement. We decided to wood-frame the whole back wall of the basement, creating a walkout onto a patio underneath a covered deck.

The problem was that the common foundation wall

Precast structural concrete slabs can add clear-span basement space for an unbeatable price

Spandeck Installation Details

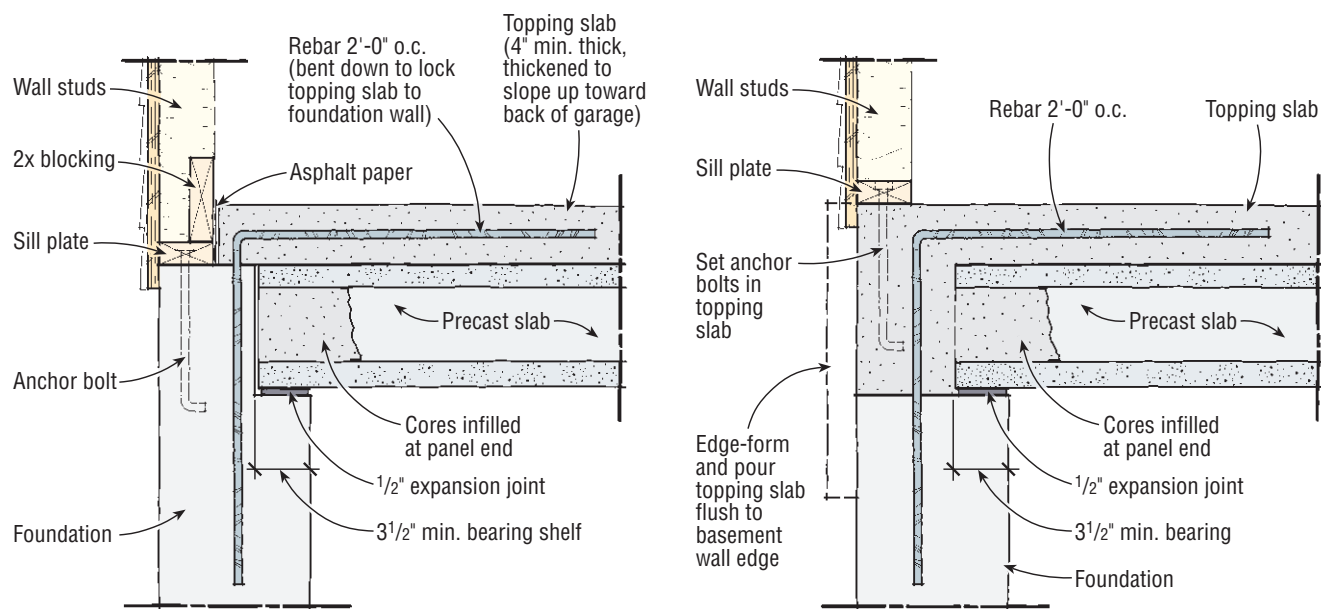


Figure 1. There are two main options for setting the precast deck components onto the basement wall: You can either set the slab inside the foundation on a shelf (left) or set it directly atop the sill (right). Mudills for the garage walls are attached to the foundation with anchor bolts as in any garage, but blocking is nailed in the stud bays to form a dam for the topping slab pour. Asphalt felt paper is applied to the perimeter walls before the topping slab is poured.

between the house and the back of the garage needed to go 12 feet deep just to get the footings down onto good ground. I'm sure you can imagine the hassle and costs to bring in 8 to 12 feet of gravel to fill in that hole so we could pour a 550-square-foot garage slab. We're talking about more than 200 cubic yards of gravel to hold up a 4-inch slab — that didn't look very cost effective.

A local contractor is also a rep for Eagle Precast, a Utah company that makes a precast 8-inch slab that can fre-span up to 30 feet. Once I thought about using their product, the decision to go with a garage over a full basement was a no-brainer. I added an extra 550 square feet of space in the basement of the house — space that ended up costing about \$8,000 to \$10,000, finished. That's

only \$15 to \$20 a square foot, compared to an average price of \$125 or more per square foot for a typical home around here.

This basement is also better than the usual basement space, because there's no need for a center girder or posts. The slabs come 8 feet wide by 24 feet long and make the whole span with no support. In fact, they can handle as much as a 30-foot span, easily carrying loads of 100 psf or more. The 10-inch panels can go even farther.

The only drawback was ceiling height. The panels had to sit on a 4-inch shelf inside the basement wall, which lowered the ceiling by 8 inches. The downstairs room ended up with only 7 feet of headroom once the basement floor was poured. But it will still make an excellent media



Figure 2. The author set his precast slabs into an 8-inch-deep shelf in the foundation wall. The shelf must provide at least 3 inches of bearing for the precast slabs. Half-inch rebar cast into the foundation wall at 2 inches o.c. will be bent down over the precast sections before the topping slab is poured, to lock the assembly together.

room when it's finished, or a great storage room.

On the next house I started, I decided to pour 10-foot basement walls in the garage basement area, then install a 28x45-foot precast garage slab. It's on a flat lot, so there's no walkout, but we managed to get 9-foot ceilings downstairs. On that house, the cost worked out to roughly \$18,000 to gain 1,380 square feet — still less than \$15 a square foot. That's pretty tough to beat.

Layout Decisions

Considering the value added, the whole process is pretty easy. The first thing you have to determine is whether you want to set the slab on top of the foundation or recess it (see Figure 1, previous page). I wanted the slab recessed, so I had the foundation contractor put a ledge in the foundation all the way around the garage.

The ledge is 3½ inches wide and 6 inches tall (the slabs need only 3 inches of bearing minimum on each end). The foundation contractor also has to put in rebar all around the foundation to bend over the top of the slab after it gets dropped into

place (Figure 2). This ties wall, slab, and topping slab into one tight piece.

The topping slab is necessary for a couple of reasons. For one thing, the suspended slab is pretty ugly and has big hooks sticking out of it that are cast in for the crane to use when setting it in place. The other reason is to provide enough slope to your garage floor to get water out. I poured the garage floor at 6 inches deep against the house, sloping to just 4 inches deep at the garage door.

Watch your elevations. Speaking of garage doors, make sure you plan ahead if you decide to put the slab on top of the wall (which my rep says is the most common application). If you put the 8-inch slab and 4-inch topping on top of the wall, you may have problems with your garage door header. I always build 9-foot first-floor walls (which usually gives me 10-foot garage walls), and I usually install 8-foot-tall garage doors. With the slab on top, we can only get 9-foot-tall garage walls — and with an 8-foot door, that leaves only 12 inches for a header.

Depending on the engineering requirements, that can be a problem. Around here I rarely get a garage door

Figure 3. After sweeping the ledge clean, the install crew lays expansion joint material on the shelf around the whole perimeter.



header that's smaller than double 11⁷/₈-inch micro lams. In fact, the last house I framed had a 5¹/₈x19¹/₂-inch glulam for the garage header. So you can see that some thought has to go into this rather than just throwing the slab in. If you recess the slab, it doesn't change any of your wall or header elevations for the garage, but it lowers the ceiling in the basement. On the other hand, if you lay the slab on top of the wall, you gain headroom in the basement. But you have to think about whether to raise the garage wall height, change the step-down of your garage foundation, or come up with some other solution.

So far I've found the best solution is to pour a tall basement wall with a shelf for the precast slab to sit into. That way, the basement has plenty of headroom, and the elevations for the garage and house are the same as they would have been with a regular slab-on-grade garage floor.

Setting the Slab

Installing the precast slab could hardly have been easier. The supplier brings his own crane and crew. The slabs come just slightly shorter than your intended span, so they will slip in easily. The ledge in the foundation was cleaned off with a broom, and a



Figure 4. The precast supplier places a 4x4-inch piece of 1/2-inch angle iron over the door opening into the room below the garage. The angle iron will function as a header to carry the edge of the precast slab.



Figure 5. Slab sections are lowered into place by crane. The crane hooks attach to steel cable loops that are cast into the slabs and will be buried in concrete when the topping slab is poured.



Figure 6. The installer uses a large pry bar to create even spaces between the slab sections. Voids will be injected with foam sealant, then filled with concrete grout.

layer of concrete expansion joint material was laid on the shelf all around the perimeter (Figure 3, previous page). The precast company supplied a 4x4-inch piece of 1/2-inch angle iron to place over the doorway into the room, to serve as a header (Figure 4, previous page). Then they lowered the slabs into place with a huge crane (Figure 5).

The slabs come 8 feet wide by whatever length you need, up to 30 or 40 feet long. It takes two guys to lower them in, one guy on each end. After all three are in place, you have to slide them around until the spacing between them is pretty even (Figure 6), then fill the spaces with a foam material and seal up the joints with concrete grout. When the topping slab is poured, it fills any remaining cracks and crevices.

Framing the garage walls. The rebar that sticks up from the top of the foundation wall leaves about 4 or 5 inches of that wall for the garage wall's bottom plate, or mudsill. The foundation wall has bolts set into it for fastening the sill down, just as in a regular job. The plate gets set right onto the foundation just as it ordi-

Figure 7. Garage walls are framed on a sill bolted to the foundation, as in any garage, and blocking is nailed between the studs to form a dam for the edge of the topping slab. Next, asphalt felt paper is stapled to the blocking to protect it from the wet concrete. Note how the rebar has been bent down to tie into the topping slab.



narilly would; so you have to frame all the garage walls as usual, then block in between each stud and apply felt paper over the blocking (Figure 7). Then you pour the topping slab up against the felt (Figure 8).

Comparing the Costs

Here's how some of the figures worked out for the first home where I installed a precast slab.

Because of the slope of the lot, I had to have 8-foot walls in the garage, and some sections of wall were 12 feet tall, which would have been the case with or without the precast slab. With a regular site-poured slab on grade, I would have needed to fill the entire area under the garage with pea gravel, at a cost of at least \$2,000.

I paid \$4,500 for the suspended slab, another \$900 to pour the base-slab, and about \$250 to have a doorway blocked out and a door hung. That's \$5,650 in all; back out the \$2,000 I didn't have to spend for fill and I gained 550 square feet of basement space for a net cost of \$3,650. I figure the area could be finished as a media room or playroom, for example, for less than \$5,000. So for around \$8,000 or \$9,000, I added 550 square feet — pretty cheap space.

You get the best value with this technique on a hillside lot, where you'd need fill to support the garage slab oth-



Figure 8. The last step is to pour the concrete topping slab, using a standard 4,000-psi concrete mix.

erwise. The next house I built was on a flat lot. In that situation, we would normally need only a 4-foot wall for the garage, but we put in 10-foot walls to add basement space. Extra costs came from more excavation, more foundation labor, more concrete, more rebar, and so on. Even so, the buyer of that house spent just \$18,000 to gain 1,380 square feet. 

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