

TECHNICAL TOPIC:

Crack-Free Garage Slabs

In 1995, 22 years ago, my favorite article, mainly because of the quote below, appeared in Builder Magazine. The question was asked, "...what's the best way to prevent cracks in garage slabs?" The answer... "Move to another planet. Here on Earth cracks in garage slabs are like Cal Ripken at shortstop - always there." All these years later, nothing much has changed. Homebuyers still expect a certain level of quality, and because garage floor cracks are so visible, they often think that cracks reflect low quality.

Garage slabs are generally built using one of two main types of construction: 1) placed monolithically with the main slab of the house, incorporating a 4" stepdown or 2) placed separately, usually using a concrete masonry unit (CMU block) or concrete stem-wall as the edge form. Additionally, there is a regional, popular use of CMU "form-blocks". Naturally, these form-blocks, just as any stem-wall, are set/bonded directly onto the footing. Here are steps to prevent cracks, spelled "minimize", especially drying shrinkage cracks, in your garage floor:

1 Prior to placing the slab concrete against a masonry or concrete stem-wall foundation, install a bond breaker material such as expansion joint material or asphaltic roofing paper,...(It is installed vertically between the wall and slab concrete interface)any material that will prevent the slab from bonding to the wall and that will allow for independent movement of the slab may be considered.

2 Although the use of CMU form-blocks are popular and make for ease of construction...if random drying shrinkage cracks are going to be unacceptable, their use should be avoided. The slab concrete locks into the block which in turn is bonded onto the foundation...this severely restricts movement of the slab.

3 Install control joints, either hand tooled or saw-cut into the slab. Joints need to be spaced at approx. 8 to 12 ft on centers in both directions (depending on slab depth, concrete consistency, subgrade conditions, etc.). Joints need to be a minimum of ¼ of the depth

of the slab. Saw cut joints need to be installed as soon as the concrete is durable enough to resist damage from the saw blade. Sometimes waiting until the next day is too late. Control joints provide a "weakened zone" or smaller "cross sectional area" of the slab. The intent is for the concrete to crack in this portion of the slab, hidden from view by the straight line joints at the surface.

4 For monolithic slabs, properly designed control joint spacing throughout the entire slab, especially in the step-down area around the garage slab, needs to be considered. Usually a "thickened" concrete area or integral footing is used in the step-down. This usually creates additional restraint of movement of the slab. Consider a control joint in these areas.

5 Cure the concrete (i.e.: curing compound, ponding, plastic sheeting) as soon as its' application can be made without damaging the concrete surface.

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Anything we can do to allow independent movement of the concrete slab, allowing it to shrink/move from all directions toward the middle, will help eliminate random drying shrinkage cracking.



Concrete slab placed directly against the stem-wall foundation. No isolation joint material. Resulting in the slab bonding to the wall; restraining slab movement and no allowance for differential movement between the slab and the wall.



Concrete placed directly against the stem-wall foundation wall, no bond breaker/isolation joint material, no interior control joints...resulting in random drying shrinkage cracks throughout the slab.



CMU form-blocks are popular methods of forming up a slab, but they lock the slab concrete into the CMU which is already bonded to the footing. This restricts slab movement.