

ASK THE INSPECTOR COLUMN FOR AUGUST 10, 2016
HEADLINE: WHY CONCRETE PILLARS FOR A DECK?

I would have thought by this time of year that most of the deck projects were done. However, based upon my e-mails, it seems there are some projects still in the works. A couple of readers have already been to get a permit and got a surprise when the building department required concrete columns for their projects.

First, a little explanation on the terms and a bit of history; for example, concrete and cement are often mixed in terminology and reference. Cement is the substance that, when mixed with water and an aggregate, generally sand and clean stone, forms a mix that hardens by chemical reaction from the cement and water to become concrete. Over 2000 years ago, the burning of lime, which is the base for all of the early cement, was done by the Phoenicians. They also made mortar or hydraulic cement from volcanic ash. The Greeks actually produced the first hydraulic cement by mixing volcanic ash with lime and aggregate. This mix would actually harden under water and was strong enough to withstand seawater. The Romans stole the Greek formulas and by 138 AD they had built huge buildings of concrete, the Pantheon being one example. This building had a dome spanning 142 feet supported by concrete. The Romans were the most prolific builders in their era using concrete. Some of the viaducts they built out of stone and concrete to deliver water to Rome are still in use today; a testament to their engineering skills. The first concrete structure built in North America was a concrete dam in San Diego. It was finished in 1769. This dam is also still in use.

Probably the most significant development was invented by an Englishman in 1813. Joseph Aspin blended a mix of pulverized limestone and clay to produce what we now know as Portland cement. The name was derived from the island of Portland, where a popular stone was quarried. The first large scale project to use Portland cement was a tunnel under the Thames River in London, England that was completed in 1828. Development of concrete has evolved over the years to include metal reinforcing, which gives concrete tremendous strength. It has been improved with the addition of fiberglass to increase its strength and durability. Today the majority of residential foundations are poured concrete.

The largest reason most building officials want to see concrete pillars in the ground for a deck is permanency. Ground based deck blocks have their place for a very small deck that is close to the grade or maybe an entrance landing with stairs. When you build a large deck, however, it is best to support this with some manner of bearing position that is below the frost line. You are, in effect, erecting a single story building without the roof. I have lost count of the number of decks I have seen that have frost heaved and are seriously out of level. Correcting this can be time consuming and costly as well as unsafe. Secondly, if the deck has been correctly attached to the rim joist, the frost heave puts undue stress on this joist, which is the framed end to the floor joists in your home.

A local building official made another comment that I had not thought of. They are now seeing a number of decks that have become closed in solariums or

sunrooms, sitting on ground based deck blocks. He is now refusing to issue permits for these buildings if they are on deck blocks. This has caused some argument with the homeowners, but the Chief Building Official in the municipality has the final say.

You have a couple of options with respect to installing concrete columns. Most people use sono-tubes. These are a heavy paper blended hollow tube that comes in various sizes. While it is not common, I have seen these “pop up” from the frost and this is really frustrating to repair. You can buy a wide base called a “big foot” that is buried at the bottom of the hole and the sono-tube fits over this base. It gives a wider support and tends to reduce the frost pop up. The catch to these is that I have heard of a few cases where they separate. The other option is called a “foot-tube.” This Canadian product, developed on the East Coast, is made of recycled plastic and is a one piece, slightly cone shaped, hollow form. Bent rebar should be fit into this foot-tube for additional strength. I have used these myself and know of more than one large addition and deck that is supported by these forms and have yet to see a problem. They run under a \$100.00 each and are marked for height so that you get the correct depth for frost. Once you set them into your hole on a base of tamped gravel, you can backfill around them and then cut the tops off to the height you want, install your rebar and pour your concrete. I have used these for not only decks, but additions to a home and have had great success with them.

With the advent of mini track hoes that can be rented from an industrial rental company, digging your holes for the supporting columns is not as back breaking as it used to be. These machines are not toys, however, and if you are not comfortable with mechanized equipment, hire an excavation contractor who has one of these machines. Have your deck laid out on the ground and your holes set by centre of the hole, not the outside. I often see decks with extra pieces added because the builder did not take that extra time to lay out the holes correctly. One last tip is to install a metal fitting called a “yoke.” This will support the wood post and keep it off the concrete so that it can’t absorb any dampness from the concrete.

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