What’s up with “below-grade crawlspaces”? I heard an interesting National Public Radio (NPR) story recently about unusual coincidences. Well, the story was about what we think are unusual coincidences, but probably aren’t, at least from a statistical viewpoint.

In just the last month I’ve had a flurry of questions about below-grade crawlspaces. Thus the headline question – what’s up? I can’t really speculate as to why so many people are asking at this time, and they’re not all from the same parts of the country, so I figure there’s nothing specific that’s prompted interest. I guess it’s just a coincidence.

Laying aside the “why” – let’s look at the “what” when it comes to below-grade crawlspaces. First, it is crystal clear that basements (any area below-grade on all sides) are not permitted in special flood hazard areas. It is clear in the National Flood Insurance Program (NFIP) regulations and it’s clear in the International Code Series that is the basis for nearly all state and local building codes.

From a physical standpoint, there are plenty of reasons why basements in areas subject to flooding are not a good idea. First, when even just an inch or two of water tops the point of entry, the entire below-grade area can fill with water. Next, as many homeowners have experienced, if their flooded basements get pumped out too fast, the basement walls can collapse inward from the pressures of the saturated soils. (This is why recovery guidance suggests pumping the water out slowly, sometimes over a period of days, so the water can drain out of the surrounding soils.)

And let’s not forget moisture problems. Even if an area of a building is only a few inches below grade, floodwaters will get trapped and can contribute to lingering moisture and mold. This is exactly why some floodplain managers recommend locating flood openings much closer to the ground than the minimum requirement. The NFIP (and building code) requirement calls for the bottom of flood openings to be no higher than 12” above grade. Doesn’t that pretty much guarantee that about 12” of water will get trapped inside the crawlspace (or enclosure) when floodwaters recede?

Limitations on below-grade crawlspaces. But back to below-grade crawlspaces. In 2001, FEMA issued “interim guidance” in the form of Technical Bulletin 11, Crawlspace Construction for Buildings Located in Special Flood Hazard Areas (SFHA). The TB “provides guidance on crawlspace construction and supports a recent policy decision to allow construction of crawlspaces with interior grades up to 2 feet below the lowest adjacent exterior grade (LAG), referred to as below-grade crawlspaces, provided that other requirements are met.”

Some of the folks I’ve talked to recently seemed to have heard that below-grade crawlspaces are acceptable and either didn’t know about TB 11, or didn’t bother to read the details. TB 11 does not – repeat NOT – permit below-grade crawlspaces whenever and wherever someone wants to build that way. Take a look at Figure 3 from the TB and note the word “maximum” in the label for depth below grade and the label for wall height. TB 11 makes it clear:

- The interior grade/top of footing must not be more than 2 feet below the lowest adjacent exterior grade (LAG), and
- The total wall height must not be more than 4 feet from the top of footing to the bottom of the floor system above.
Now you can see why I wish the word “shallow” was in the title of TB 11. Although the figure to the right is not “to scale,” simple arithmetic reveals the top of the wall will be only 2 feet higher than the LAG. What does this tell us in terms of the SFHAs where this type of foundation can be used? Only ones where the depth of water during the base flood will be relatively shallow!

The crawlspace shown in the figure could be used only in SFHAs with base flood depths of less than about 3 feet (wall height above LAG plus depth of floor system). Of course, if the builder doesn’t go the full 2 feet below LAG, then the wall will extend higher above LAG, which would permit use of a below-grade crawlspace in slightly deeper floodwaters. Now, think through the same scenarios, but suppose the community enforces one-foot of freeboard. What did I tell you? Only in shallow SFHAs!

Adopting ordinance provisions for below-grade crawlspace. Something else is required by the TB if communities want to allow below-grade crawlspaces, something that too many people skip over. Even if the dimensional limits and other requirements (such as drainage) are met, “Communities that choose to allow below-grade crawlspace construction will be required to amend their floodplain management ordinance to include the provisions outlined in the following sections on below-grade crawlspace construction.” Check with your NFIP State Coordinator to learn more.

Flood insurance and below-grade crawlspace. These days, with questions about how NFIP flood insurance rates and premiums will only go up as the NFIP implements the requirements of the 2012 Reform Act (called “Biggert-Waters), we should pay attention to how below-grade crawlspace are treated when it comes to insurance premiums. The cost of actuarially rated policies varies significantly with at least one factor: position of the lowest floor relative to the base flood elevation. TB 11 already explains flood insurance implications: buildings with below-grade crawlspace “must be submitted for a special rating under the Submit-to-Rate process.” This means that while it may be legal to build below-grade crawlspace foundations the cost of flood insurance is going to be more. (This brings to mind one of my favorite sayings: Just because you can do it, doesn’t mean you should.)

How much more might the insurance cost? We can only guess at the cost of flood insurance for a TB 11-compliant below-grade crawlspace. But there’s no guessing about the cost of insurance for a building with a below-grade crawlspace that doesn’t meet all of the limitations in TB 11. Suppose the interior grade is three feet below the lowest adjacent grade. For insurance purposes the crawlspace is now considered a basement and the premium would likely be about five times more than if the interior grade was at or above the exterior grade on at least one side. Whether we recognize it or not, the decisions local permit officials and inspectors make every day can make a big difference to owners over the life of a building.

Link:
NFIP Technical Bulletins
http://www.fema.gov/plan/prevent/floodplain/techbul.shtm

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