Submit your own items or suggestions for future topics to column editor Rebecca Quinn, CFM, at rcquinn@earthlink.net. Comments welcomed!

I took a short walk down memory lane recently, prompted by a long talk with the City of Baltimore’s floodplain manager. Some of you know that for many years I was Maryland’s NFIP State Coordinator. But fewer know that Maryland administers a state nontidal floodplain permit program and I started my government career as an engineer in that section. It didn’t take much to get me talking about a number of interesting projects in Baltimore City from those years. [One of the more memorable that we didn’t get around to talking about was having the swim coach who would go on to take Michael Phelps to the Olympics stand in my office – stating in no uncertain terms that “you WILL issue a permit” (his emphasis!) for an air-inflated bubble over a swimming pool located in an area with a fair amount of existing development in the floodplain.]

I originally called to ask how Baltimore’s emergency services and fire department handle some apartment and condominium buildings that were built on piers over water in Baltimore’s harbor. It turns out the deliberations surrounding those projects occurred before the current floodplain manager came on board, but that didn’t stop us from talking about the whole concept of buildings over water. That’s what I want to review with you now.

First, let’s consider what’s in the NFIP regulations and building codes, and then we’ll take a look at NFIP flood insurance coverage for buildings over water:

- **Zone A, flood hazard areas identified with the letter “A,” including A, AE, A1-A30, AO, and AH:**
  - NFIP regulations 44 CFR 60.3(c) have no explicit provision that deals with buildings over water, which means buildings over water are permitted in Zone A provided they meet all of the requirements for Zone A.
  - International Residential Code and International Building Code (and ASCE 24, a standard referenced by the IBC), like the NFIP regs, have nothing about buildings over water in Zone A. Thus, like the NFIP, this means such buildings are permitted, again provided they meet the code requirements.

- **Zone V, coastal high hazard areas identified by the letter “V,” including V, VE, and V1-V30:**
  - NFIP regulations 44 CFR 60.3(e)(3) explicitly requires that communities “Provide that all new construction within Zones V1-30, VE, and V on the community’s FIRM is located landward of the reach of mean high tide.” What really jumps out at me is that this is the ONLY place in the NFIP rules that the term “new construction” is not paired with “substantial improvement.” The effect is that under the NFIP rules, while construction of new buildings over water in Zone V clearly are not permitted, existing (pre-FIRM) buildings could be substantially improved provided they are brought into compliance with all of the requirements for buildings in Zone V (including being supported on pilings or columns and being elevated with the bottom of the lowest horizontal structural member at or above the base flood elevation).
  - IRC and IBC (by reference to ASCE 24), like the NFIP regs, require new construction to be landward of the reach of mean high tide. Unlike the NFIP, however, the building codes also apply the limitation to substantial improvements.

Now, let’s look at what the NFIP Flood Insurance Manual says about buildings over water. Given the complexity of the Manual, this is something I do with considerable caution – so I’ll summarize what I learned and provide some quotations from the Manual in the box below. What’s really interesting is that whether a building over water is – or isn’t – eligible for flood insurance has nothing to do with which flood zone it is located in:
  - The NFIP will not insure new buildings over water or buildings over water that are substantially improved after October 1, 1987.
• The NFIP will insure buildings that were constructed or substantially improved before October 1, 1982 – and regular pre-FIRM rates apply. There’s an exception with conditions that apply to buildings that become entirely over water because of erosion.

• The NFIP will insurance buildings that are partially over water, but procedures referred to as “submit-for-rate” will be used. As I understand it, that means coverage is available only with specific approval and after underwriters establish the risk premium rate.

The rest of the story. I’m guessing most of you want to know the outcome of the bubble over the swimming pool story. To be honest, I don’t recall if the project actually moved forward. But I do recall our discussions about what we’d ask for in order to approve the proposal. We were particularly concerned about the fabric structure getting loose during floods. The area, with quite a few buildings across the stream as well as downstream, had experienced flooding several times in the 1970s. Also, there was an undersized culvert about 1000 ft downstream that, if I recall correctly, had been blocked by debris during the September 1979 flood, which of course exacerbated flooding in the vicinity of the swimming pool. It was easy to imagine what might happen if a huge, Olympic-pool sized fabric covering was added to the debris. Thus, we decided the applicant would need to provide assurance that the fabric would be anchored to remain on site during conditions of the base flood.

Now, fast-forward more than 20 years, and check out the International Building Code, Section 3102 Membrane Structures, which has a specific provision for engineering design of such structures. They are required to be “designed and constructed to sustain … live loads including wind, snow or flood and seismic loads”. I think you know what I’d say if someone asks me how they should interpret that provision!

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I’d appreciate your comments, suggestions for additions and priorities. And what do you think should be on the follow-on reading list for folks with more experience?

[RCQ]