



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

Time for another grab bag of topics. I get a lot of questions that wouldn't take a full column to answer, so this month I'll share several with you. As usual, let me know your take on these questions.

Below BFE or Lowest Floor? For buildings, do we regulate “below the BFE” or “below the lowest floor”? FEMA guidance documents refer to both, but what do the regulations specify? Turns out we're supposed to do both – and in most cases it probably doesn't make much difference. The NFIP regulations for flood damage-resistant materials clearly call for such materials below the BFE. But the requirements for “fully enclosed areas” (Zone A) and for the “space below” (Zone V) clearly refer to the lowest floor. So the only time there's a difference is if the lowest floor reference elevation is higher than the BFE (i.e., the top of the floor of the lowest floor in Zone A or the bottom of the lowest horizontal structural member of the lowest floor in Zone V is higher than the BFE). It's a fine point, I agree, and the only situation where I've heard it can make a difference is in V Zones. Picture a building that is elevated well above the BFE with breakaway walls surrounding an enclosed area under the building. Do the entire walls from top to bottom have to be designed to breakaway? Or can there be a “failure joint” located right at the BFE? I've heard that some builders do this, but it seems to put too fine a point on the regulations because we all know that big floods rarely stop magically right at the BFE.

SI/SD or SD/SI? You may have noticed that the new *Substantial Improvement/Substantial Damage Desk Reference* (FEMA P-758) uses the acronym SI/SD. I've noticed that a lot of people say “SD/SI” which probably suggests inclination towards the tidiness of listing things alphabetically. But there's a reason SI is listed before SD. Look at the NFIP regulations for the definition of both terms. While both are defined, you'll see that SI includes SD. Technically, I suppose that means all we need to talk about is SI and, by definition, we'd be talking about SD at the same time. I expect we all agree that it is much clearer to always refer to both SI and SD. But there's another more subtle take on it that I like: more than 20,500 communities participate in the NFIP and (at least in theory) every one of them could be faced with handling a substantial improvement on any given day, but dealing with buildings that have sustained substantial damage usually is a much rarer occurrence.

Measuring Net Open Area of Flood Vents with Fixed Louvers. Many standard air vent devices are manufactured with fixed louvers or slats that are at an angle. This can present a challenge when such devices are used to satisfy the requirement for openings in foundation walls and walls of enclosures below elevated buildings in Zone A. NFIP Technical Bulletin #1 gives one answer. Manufacturers of air vents typically note the number of square inches of net free area that the device provides for air flow (either stamped into the metal frame or noted on the packaging). This calculation should be used when the devices are installed to provide 1 sq in of net open area for each sq ft of enclosed area.

I did some checking and found that many commercial louvers intended for ventilation purposes have free areas between 30% and 60% of the total frame size, while many residential-style louvers have free areas below 30% of the total frame size. The variation is a function of the angle of the blades and the thickness of the blade material, because both affect the profile “seen” by the flow of water. If the manufacturer does not have a pre-determined net open area, or if site-built louvers are used (see TB #1 Figure 18), the method for calculating the net open area is straightforward and based on the method used in the ventilation industry. For cases where the blades are at an angle, an illustration showing how the free area is determined for a static vent (fixed blades) is available at <http://www.cjmetals.com/calcnetafreearea.pdf>. The thickness of the blade is taken into account when measuring the distance perpendicular to the blades.

Below-Grade Crawlspace. Just my opinion of course, but I think this falls into the “just because you can do it doesn't mean you should” category. I always caution folks to look very carefully at the limitations outlined in Technical Bulletin #11 that prescribes the conditions under which a community can approve below-grade crawlspaces. And especially note that the TB clearly states that, after consultation with their State NFIP Coordinator, “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.”

OK, so TB #11 basically says that a below-grade crawlspace may be permitted if the top of the footing is no more than 2 ft below grade and the total wall height is no more than 4 ft (top of footing to bottom of floor joist). And don't forget internal drainage – that's a requirement, too. And then there are the flood insurance implications. If your community permits below-grade crawlspaces, you might want to suggest that owners talk to an experience insurance agent to understand

how the cost of a policy will differ. NFIP policies on these buildings, even if compliant with the limitations in TB #11, will be higher than if the crawlspace complies with the basic requirement that the interior grade not be below-grade on all sides.

Citing NFIP Technical Bulletins in Local Regs? Regulations, building codes, and standards referenced by the codes set forth specific requirements that are mandatory. Look carefully at the NFIP regulations and the building codes (and ASCE 24), and you'll see that the language is not phrased as guidance. For example, "communities shall require" is mandatory language, while "communities should require" is permissive. Many FEMA publications are written to achieve three objectives: (1) to explain the minimum requirements (mandatory); (2) to offer guidance for local officials who have to render interpretations of situations that aren't precisely covered by the regulations and codes (mandatory and permissive); and (3) to encourage practices that increase resistance to flood damage (permissive). I've heard that some communities cite one or more of the NFIP Technical Bulletins in their regulations. This could actually create problems because the TBs do include non-mandatory recommendations. For example, TB #1 recommends that "openings should be installed on at least two sides of each enclosed area." This is a good practice that is not spelled out in the NFIP regulations. If TB #1 was cited in your regulations, how would you enforce that recommendation?

That said, now I should explain why the model building codes cite NFIP Technical Bulletin #2 *Flood Damage-Resistant Materials Requirements*. The International Code Council, Inc., has a strict rule that material referenced by the code must meet requirements set forth for "standards" – and one requirement is that standards shall be developed according to a prescribed process and written in mandatory language. (Here, the term "standard" refers to a whole document, not a specific requirement; ASCE 24 is a standard referenced by the IBC and IRC.) The reason mandatory language is required is because a standard referenced by the code is "considered part of the requirements" of the code. Given that, why do the codes reference TB #2? Because, although it was not developed as a standard, it is the only source of information about flood damage-resistant materials and in this case, the committees developing the codes decided a non-mandatory document is better than nothing.

Pre-FIRM Building and Floodway Encroachment? Suppose the owner of a pre-FIRM building in a floodway proposes interior-only renovations that are determined to be substantial improvements. We all know that the whole building has to be elevated and brought into compliance. I'm less certain that we all know the answer to this question: is an encroachment analysis required? I think the answer is fairly obvious – no, an encroachment analysis is not required as long as the actions necessary to bring the building into compliance don't increase the exterior dimensions (see FEMA P-758). But if the answer is obvious, then why did I ask the question? I ask it because I've heard that not everyone comes to the same conclusion. But think about it. If the building is already on a crawlspace foundation, then extending the foundation to the required elevation doesn't create more encroachment into the floodway. If the building has a basement that is filled in, perhaps allowing the next higher floor to become the elevated lowest floor, that doesn't expand the footprint. I've never heard of someone using fill to bring a pre-FIRM building into compliance, but I suppose it could happen. Obviously, if there is any increase to the footprint, whether by fill or by additions, then a floodway encroachment analysis is required, and if the analysis indicates any increase in the BFE, the basic rules apply and the work cannot be permitted.

Resources:

NFIP Technical Bulletins at <http://www.fema.gov/plan/prevent/floodplain/techbul.shtm>

SI/SD Desk Reference at <http://www.fema.gov/library/viewRecord.do?id=4160>

Links to the NFIP regulations at <http://www.fema.gov/library/viewRecord.do?id=4107>

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GENERAL NEWS & INFO

FEMA Releases Updated NFIP Guidance for Conducting CACs & CAVs By James A. Walke, Director of Risk Reduction Division, FEMA

FEMA released the updated *National Flood Insurance Program (NFIP) Guidance for Conducting Community Assistance Contacts and Community Assistance Visits* in late April for States to use effectively immediately. Please note the new publication number is FEMA F-776 April 2011. This document provides "how to" guidance for community NFIP floodplain management program monitoring and the provision of one-on-one technical assistance. Updating the guidance was a key recommendation from the NFIP Evaluation, and it benefitted from several rounds of State and FEMA Regional Office comments during the development process.