



By Rebecca Quinn, CFM

### Two Floodway Questions and a Reminder about Chases and Elevator Shafts

#### Floodways: Is Every "Development" in a Floodway an Encroachment?

I spent several years early in my career working as a water resources engineer, processing applications for development in floodplains in Maryland. Much of what we saw were bridges and culverts, and the occasional proposal for filling. Most applications had hydrology and hydraulics analyses, i.e., floodplain studies. We checked all sorts of things, including whether we agreed with the engineer's selection of Manning's Roughness Coefficients, also known as "Manning's n."

Manning's n coefficient is a measure of the friction of surfaces over which floodwater flows in open channels and overbanks. It's pretty simple: the "smoother" the surface, the faster water flows, and the lower the value of the coefficient. The inverse is true: the rougher or more obstacles in the path of water, the slower the water flows, and the value of the coefficient is higher. For example, some guidance suggests  $n = 0.035$  for pasture (typically low grass) value, increasing to 0.075 for heavy brush, and topping out at 0.15 for trees. The differences may not seem like a lot, and some other factors come into play, but the choice of value can make a pretty significant difference in water surface elevations. Of course, in practice it's a little more complicated and This [USGS Water-Supply Paper 2339](#) (1989) may not be the most recent source, but it includes discussion and photographs of forested floodplains with computed n values as high as 0.2.

- **Here's the question:** We know what the NFIP regulations require (sidebar, emphasis added). Suppose you get an application for a home elevated on columns (no enclosure) to be built on a one-acre lot in a heavily forested floodplain — and it's located in the floodway. The plans show the lot will be largely cleared — hundreds of trees will come down. And the house will have, let's say 25-30 columns (lucky us, the owner wants to park underneath, so the lowest floor will be several feet above the Base Flood Elevation). So, considering the phrasing in your regulations should be the same as the CFR, what would you require?

- **Here's my take:** An engineer who has experience with floodplain and floodway modeling, and who understands Manning's n, can provide a solid, reasoned explanation as to why the proposal does not constitute an encroachment. Indeed, it's easy to understand that removing trees (plus lots of underbrush?) allows the water to flow faster. And, adding back the equivalent of 25-30 trees hardly represents more obstruction to flow than the hundreds of trees removed. Therefore, I wouldn't require a computer-based analysis.

However, as a careful permit official, I would require the applicant to provide a signed and certified report from an engineer to lay out the rationale for the record. Please let me know if you see it otherwise. Take note: this project does not qualify as a "minor project" described in FEMA 480 (see next topic).

#### Floodways: Utility Company Poles and Towers

Installation of poles and towers is development under the NFIP's broad definition of the term, which means communities should issue permits when companies install them in special flood hazard areas. The first question we need to consider is what requirements apply generally, then we'll get to the floodway question.

- **As with all floodplain development**, the objective is to resist flood damage and not contribute to damage on other properties. For utility poles and towers, I'd hope the company would recognize

#### 44 CFR § 60.3(d)(3)

When FEMA provides floodway data and designates regulatory floodways on FIRMs, "the community shall:

(3) Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it **has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels** within the community during the occurrence of the base flood discharge."

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installing in flood-prone areas likely requires consideration of stability under conditions of flooding. Will the ground be saturated and for how long? How does that affect the ability of the tower or pole and anchor wires to hold up the service lines? How likely is debris impact? If debris collects at a pole or tower, does that affect stability? For local officials, you might ask what should a company submit to support a permit application? I'd ask for an explicit statement that anticipated conditions of flooding (depth, velocity, duration, and debris) were considered in developing the installation specifications.

- **Now, what about installation of poles and towers in a floodway?** In theory, any encroachment in a designated floodway should be evaluated to determine whether there is an unacceptable impact on flood levels during the base flood. But it's not practical to use computer models to evaluate the presence of a tower, or one or two (or more) 18-inch diameter utility poles carrying lines across a waterway. FEMA guidance recognizes this limitation, indicating that "some minor projects are too small to warrant an engineering study and the [no-rise] certification ... a sign post or telephone pole will not block flood flows." See [FEMA 480, NFIP Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials](#).

**My advice?** If your community sees the occasional pole or tower, I suggest you see the discussion above about asking the applicant to provide a signed and certified report from an engineer to lay out the rationale for the record as to why a tower or couple of poles will not cause any increase in flood levels. You'll also want a statement about stability under flood conditions.

But suppose a local utility provider has a wide network of poles and towers, and plans for replacements and new towers and poles, many of which will be in SFHAs (and perhaps floodways)? Has anyone considered some form of "blanket" or "general" permit that requires the provider to meet certain specifications, perhaps an annual report? Let me know if you have something along those lines and I'll report back next time.

### Utility Chases and Elevator Shafts

A **utility chase** typically is a framed enclosure used to protect wires, cables, water pipes, and sewer pipes that would be exposed to weather, for example when a building elevated on pilings or columns does not have an enclosure used for parking, storage, or building access. Utility chases are also more attractive than exposed pipes. An **elevator shaft** is a framed enclosure that surrounds the path of the elevator. Our colleagues in coastal communities will tell you they're seeing elevated homes with residential elevators.

For many years, floodplain folks saw "enclosure" and figured chases and shafts must meet the same requirements for enclosures below elevated buildings. Those requirements are flood openings in Zone A/AE or breakaway walls in Zone V/VE. I trust you're keeping up with revisions to [NFIP technical bulletins](#)? When you see plans for buildings in SFHAs with utility chases or elevator shafts, reach for these that were revised in 2020:

- **Technical Bulletin 1 (flood openings).** "Because a utility chase is not considered an enclosure, it does not have to have flood openings (but flood openings may be provided)."
- **Technical Bulletin 4 (elevators).** "However, elevator shafts/ enclosures that extend below the BFE are not required to include flood openings if the openings conflict with fire safety protection requirements in building codes." TB 4 isn't as clear about breakaway walls in Zone V, so look to TB 5.
- **Technical Bulletin 5 (free-of-obstruction).** "Elevators and elevator shafts [in Zone V] are not required to break away but must meet flood damage-resistant material and equipment requirements. ...Flood loads acting on elevator components, any non-breakaway shaft walls, and potential wave runup and reflection effects must be accounted for in the design of the elevated structure and its foundation system."

#### 2024 International Residential Code and Utility Chases and Elevator Shafts

Does your state or community adopt and enforce building codes based on the International Codes? Flood provisions have been in the I-Codes since the 2000 edition.

The 2024 IRC will include exceptions to the requirements for enclosure to clarify those requirements to not apply to elevator shafts and utility chases that are "the minimum size necessary to protect the utility lines and do not provide access for a person to enter the space."

Submit your own items or suggestions for future topics to Rebecca Quinn, CFM, at [Rebecca@rcquinnconsulting.com](mailto:Rebecca@rcquinnconsulting.com). Explore the archive of [Floodplain Manager's Notebook](#) columns.