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vantage point

Mitigation Matters

There is a difference between "hazard" and "risk" in the emergency management world. The first term refers to something that can cause harm (a flood, a fire, a volcanic eruption) and the second to the probability of experiencing danger or harm from that hazard. When we talk about mitigation in floodplain management, this is the practice of avoiding risks when possible ("Choose where you build carefully") and minimizing the impacts of flood risks where they can't be avoided. Much as we would like to think we can make ourselves invulnerable, nature will always throw us a curve ball, sometimes antagonized by our own foolish actions.

Mitigation planning has taken the forefront in planning for recovery and improving community resiliency. Newspapers and magazines are still filled with articles about ongoing hardships of those who lost their homes and businesses to Superstorm Sandy. The utter magnitude of the disaster, both in area and in dollar assessment of damages, continues to challenge owners and administrators and legislators as to how best to move forward.

In the midst of this, FEMA and others continue to organize their observations to help us all survive the next big storm—and we know there will be other big flood events in our futures. This kind of post-disaster check-up is common practice to see how well our flood maps performed: did they accurately predict where floodwaters would extend both horizontally and vertically? Should the maps be updated, should new flood studies be undertaken, should communities plan their disaster responses differently?

A year after Sandy's landfall, FEMA has issued a report from its Mitigation Assessment Team, individuals from public and private sectors, professional associations, and academia convened in December of 2012 to assess building storm worthiness. The result is "Hurricane Sandy in New Jersey and New York: Building Performance Observations, Recommendations, and Technical Guidance" (FEMA P-942).

While the title implies only guidance for two states, this study of government facilities, private homes, critical facilities, historic structures, data centers, and buildings of various heights contains recommendations for disaster-resistance applicable to any hurricane- or floodprone area. Design professionals should note the sections of this report that may be incorporated into local ordinances; consider this report as advance warning of changes likely to come.

> "...consider this report [FEMA P-942] as advance warning of changes likely to come."

Storm surge was a major cause of damage during Sandy, but inundation inland of the coast was often far beyond levels anticipated if relying only on Flood Insurance Rate Maps. The combination of high tide, full moon, and perpendicular approach of the storm to the coast (rather than most hurricanes' south to north trajectory) culminated in water being pushed inland. Damage from inundation, erosion and scour, and wave action in some cases resulted in dramatic structural failures, while elsewhere the main damage was to utility systems, particularly when situated below Base Flood Elevation (BFE).

Sandy struck shortly after passage of the Biggert-Waters Act of 2012, which had required FEMA to assess impact, effectiveness, and feasibility of incorporating nationally recognized building codes (I-codes) in the NFIP floodplain management criteria. That study ("Including Building Codes in the National Flood Insurance Program", issued November 2013) found that the biggest economic impact of enforcing building codes as part of the NFIP would be in rural communities and reservations that either do not already enforce building codes or have codes substantially out of date. Most communities participating in the NFIP already have codes based on I-codes. While enforcing such codes does reduce risk (and thereby keeps insurance rates lower), the primary effective tool in reducing flood related losses is elevating structures, further enhanced by adding freeboard and foundation improvements.

While taking note of effects of sea level rise on coastal communities and the need for designers to consider those impacts, perhaps the most significant sections of FEMA P-942 for surveyors address building codes and elevation. Throughout this document we see recommendation to elevate existing structures where possible and design new structures so their lowest floors are at least

two feet above BFE. Other recommendations address the use of dry floodproofing techniques applied to non-residential structures to specific heights in relationship to BFE when those structures cannot be elevated.

Certainly this translates into something surveyors are best prepared for of all the design professionals and others involved in construction, deconstruction, or reconstruction. Where should the critical building system components (electrical, HVAC, furnace, boilers) be placed in relation to predicted flood levels? Where should back-up fuel supplies for emergency power systems be stored? Where should communication facilities in data centers be placed? The answers are based upon elevations.

Of course there are mapping components to FEMA P-942's recommendations. While erosion control structures such as bulkheads and seawalls are meant to reduce landward erosion and flood damage, some failed during Sandy while others that remained intact were overtopped. Mapping procedures for identifying flood hazards landward of these structures should be reviewed and revised. ■

References

"Hurricane Sandy in New Jersey and New York: Building Performance Observations, Recommendations, and Technical Guidance" (FEMA P-942)
http://1.usa.gov/1jpD1XZ

"Including Building Codes in the National Flood Insurance Program"
http://1.usa.gov/1mwoLz8

For examples of how mitigation functions, see FEMA Region X report:
"Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan: a Guidebook for Local Governments"
http://bit.ly/KtI7Gw

Wendy Lathrop is licensed as a Professional Land Surveyor in NJ, PA, DE, and MD, and has been involved since 1974 in surveying projects ranging from construction to boundary to environmental land use disputes. She is a Professional Planner in NJ, and a Certified Floodplain Manager through ASFPM.