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The big storm, one year after: Its been a busy year of dealing with post-Sandy issues

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As we approach the one year anniversary of CAT-90 Sandy, I wonder if we will have another such incident anytime soon. This year? Next? Never? Well the latter is a bit optimistic, but for sure it will happen sooner than later. The frequency of infrequent storm events is becoming shorter and shorter. What we do know is that buildings in coastal zones need to address hardening of their infrastructure, and a big part of that has become dry flood proofing.

The most recent maps by the Federal Emergency Management Administration (FEMA) have now updated the base flood elevations at coastal zone areas, and to no one's surprise, the new flood zones are at higher elevations. Thus, both the real estate and design industry have to contend with the new reality of the post-Sandy world: Protect your infrastructure, and in turn it will protect you. In the most recent FEMA maps for instance, in lower Manhattan near the intersection of Chambers and West Sts., the base flood elevation has increased from approximately 10 to 11 ft. Most recently erected buildings in the vicinity were considered flood protected under the 1968 NYC Building Code provisions, but yet Sandy still damaged many of these buildings. Thus, for owners pursuing flood insurance, they will need to get FEMA flood certification signed by a PE or RA certifying that the building's design is flood-worthy and meeting FEMA bulletin 3-93. This bulletin requires that the owner create a deployment plan for flood-protection and for evacuation of the building. As flood protection may block path of egress from the building, it requires that the building must be evacuated before protection is deployed. However, in practice the NYC Department of Buildings has been requiring that all egress be maintained plus the practicality of fully evacuating a high-rise residential building is not always a certainty.

Given the response by FEMA, other government agencies have also responded by creating funding to promote the hardening of infrastructure as well as to aid municipalities with funding these projects. Most recently, the NY Building Congress Task Force on NYC Storm Preparedness presented its recommendations, which focused on stronger and more redundant power and telecommunications grids; expanded and more resilient infrastructure; better building performance and design standards; and improved emergency-planning oversight and protocols. A presentation of this report on June 6th, included speakers from state and federal government, the latter noting that new funding for infrastructure hardening was going to be made available fairly quickly to state and local governments. To complement this, the NYC Department of Buildings has created a Sandy Consultation Group which advises owners on the viability of their new designs and provides expert advice on how best to navigate the complex codes and regulations that govern dry-flood proofing measures.

In the past year, my firm Thornton Tomasetti, has assisted various commercial and residential real estate firms to assist them with hardening and resiliency projects at various properties. Some just

wanted an audit and written recommendations, others wanted construction documents to execute changes. In some cases, owners relocated MEP services to higher floors, rather than deal with the impracticalities of trying to keep the Hudson and East Rivers out of their below-grade areas. While that is an extreme change, the other approach is to dry-flood proof the building's weak points. There are numerous ways of doing so, some as simple as the tried-and-true sandbags which Goldman Sachs employed so notably at their lower Manhattan building prior to Sandy's arrival. In addition, there are also other devices readily available such as water-filled interlocking barriers, demountable flood gates, and lastly, the post-and-beam type demountable barriers. The latter, in my opinion, offers the greatest level of protection and flexibility within the constraints of the NYC urban environment. We have seen an increase in governmental and institutional RFP's seeking "storm hardening and resiliency" type services throughout New York state and city. It is a fair statement to say that post-Sandy work will be a staple in this area for some time.

The post-and-beam type demountable barriers consist of permanently installed base plates that are level with the building's sidewalks and aluminum posts and hollow planks that are assembled prior to the predicted storm event, and dismantled afterwards. These can be stored on or off-site, and erected easily and quickly. These barriers have been deployed in such notable places as the Grand Ole Opry in Nashville; Prince George's County Administration Building in Upper Marlboro, MD; The African American Museum, National Mall, Washington, D.C.; The Bolivar Dam, Bolivar, OH and most notably to contain the Danube River at Prague. Thornton Tomasetti currently has three active projects in NYC employing these barriers. Of course, these devices have to go hand in hand with other physical changes to the building so that all existing life-safety systems are not circumvented by the barriers, particularly egress.

The design industry has had a shot in the arm with post-Sandy repairs and implementation of new flood proofing measures. The demand for these services has reached a high level in the past months, as more funding becomes available from both governmental and private programs. The newly designed building must now re-think where to place the not so sexy program functions such as vehicular ramps, mechanical rooms and telecommunications entry points. It is no longer a given that these will go below grade or buried within the confines of the building. A robust water management approach must now be considered when designing new buildings or retrofitting older ones. There are numerous reference codes available to guide the designer, most notably ASCE 7 & 24, FEMA Technical Bulletin 3-93, NYC Executive Order 233, RCNY 3606 and Appendix G of the 2008 NYC Building Code. All these have to be incorporated with a heavy dose of common sense, so that they complement each other and accommodate Fire Department apparatus connections and truck access, as well as that any barriers or base plate anchorages placed outside the property line need long-term permitting through both DOT, Dept. of Buildings and DOT Revocable Consent and Franchises. All of these affect the layout of the on-grade floor plan as well as the building skin at this level.

In summary, it's has been a busy year of dealing with post Sandy issues and getting those implemented. Where there is room for improvement is in modifying current codes to encompass the aforementioned measures so that the review and approval process is clearly defined and easy to follow.

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