CHAPTER 5 URBAN MITIGATION ALTERNATIVES: OPPORTUNITIES FOR NFIP REFORM

The Rockaway Peninsula, Queens

OPPORTUNITIES FOR NFIP REFORM

The case studies and detailed analysis of retrofitting options for the most vulnerable building typologies in New York City have brought to light a series of specific challenges that can make retrofitting projects physically or financially infeasible. Understanding the applicability of current federal regulations to the diversity of buildings found in New York City is a first step towards developing cost-effective solutions that can be implemented by homeowner and property owners.

The Homeowner Flood Insurance Affordability Act, enacted by Congress in 2014, requires FEMA to provide guidance for cost-effective alternative methods of mitigation for urban areas where buildings cannot be elevated because of their structural characteristics. FEMA must take these new alternative methods into account in calculating premium rates for flood insurance coverage. This chapter identifies several opportunities for potential alternative methods of mitigation that merit further research, based on sound building science and actuarial analysis, by engineers, actuaries, and policymakers at FEMA to determine whether they can effectively reduce risk where other methods are not practical. In addition, further FEMA guidance would aid the effective application of wet and dry floodproofing methods to the building types characteristic of New York City and other cities. The City looks forward to continuing to work with FEMA on further research and to explore these and other opportunities to provide cost-effective and practical solutions for a wider range of buildings in New York City and other urban areas.

The City is also conducting its own research assessing the implications of the NFIP's increasing flood insurance premiums on housing affordability in the floodplain in New York City. Specifically, the city is conducting two studies, one focused on one-to-four family buildings and another one on multi-family buildings, to better understand and communicate the impact that rising flood insurance costs and an expanded floodplain will have on New Yorkers, and to make policy proposals to both reduce risk and maintain affordable insurance.

SUGGESTED ALTERNATIVE MITIGATION METHODS

Explore allowing wet floodproofing of a wider range of uses below the DFE for masonry buildings with foundations that demonstrate strong structural integrity

Masonry buildings with foundations, which are very often semi-detached or attached, largely avoided substantial structural damage during Sandy. However, federal regulations (also incorporated into the local building code) require basements and cellars to be filled to lowest adjacent grade and non-residential spaces below the DFE to be elevated or dry floodproofed, with the exception of such spaces used as parking, crawl space, access and storage. These are also the only options recognized by the National Flood Insurance Program towards insurance premium reductions.

In addition to being complicated and costly retrofitting projects that few owners are likely to take on, the current required set of options may unintentionally increase the risk of damage to the structure and its neighbors. In many cases, these buildings survived flooding from Sandy without structural damage, apparently because water entering the structures helped equalize hydrostatic pressure. Filling in below-grade spaces and preventing the water from entering the building by dry floodproofing may create new structural risks for attached buildings. In a case where, for example, only one of two attached buildings elects to dry floodproof, structural modeling would be necessary to make sure that the dry floodproofed areas are structurally independent of the adjacent building and resistant

to the lateral pressure that would come from water-filled basements on either side of the building. The consequences of the application of different floodproofing measures on buildings that have historically been structurally linked are unknown and potentially problematic.

For these structurally heavier buildings, allowing the water to flow through the structure may be the safest strategy to protect its structural integrity. Combined with the elevation or dry floodproofing of critical systems, this alternative strategy may be an effective, simpler and cheaper way to adapt many of the buildings in New York City. If these wet floodproofed spaces are designed with flood damage-resistant materials, recovery can be accelerated. This report recommends that FEMA investigate the structural viability of this option, and analyze from an actuarial perspective the level of damage that these buildings have incurred during actual flood events.

Exploring wet floodproofing active uses is especially important for commercial corridors, which in dense urban neighborhoods provide essential services to communities during normal conditions or following times of emergency. The only currently available options for adaptation are elevation, which in an urban context fundamentally jeopardizes retail viability, and dry-floodproofing, which is extremely costly and raises serious structural integrity questions presented above. Alternative strategies, such as wet floodproofing commercial space, should be explored to allow commercial corridors in the floodplain to be both physically and economically resilient to flood hazards. Combined with the right set of operational adaptations and procedures in place, wet floodproofing can also minimize business disruption during a flood event and help neighborhoods as a whole recover more quickly.

Explore allowing critical systems to remain in place below the DFE within enclosures that prevent the water from entering

In a dense environment with older buildings like New York City, relocating critical systems to locations outside the building or on the roof is often not possible. As a result, the only place to relocate critical systems is within the building, which can result in the loss of usable floor area for single-family buildings and housing units for multifamily buildings. The loss of floor area and units may deter owners from retrofitting their buildings, leaving them and their occupants at risk.

Technology enables the design of waterproof enclosures around critical systems, allowing owners to protect their systems in place below the DFE and minimize the loss of floor area. While FEMA encourages these practices, they do not currently account for the reduced risk of flood damage in their flood insurance premiums under the NFIP. With attention to life safety issues, and emergency access and egress needs, this option should be explored to provide owners with a workable solution that maintains the viability of the building. This report recommends that the NFIP recognize safe waterproof enclosures as an adaptation measure to establish its ratings.

NEED FOR FEMA GUIDANCE ON HOW TO APPLY EXISTING METHODS TO URBAN TYPOLOGIES

Develop guidance for dry floodproofing masonry buildings

Existing FEMA guidance for dry floodproofing is geared towards wood-frame buildings. Based on their structural integrity, masonry buildings may require less extensive construction to dry floodproof and, in some cases, be limited to installing a dry floodproof

membrane under the skin of the building without structural reinforcement.

Understanding the range of dry floodproofing techniques for masonry buildings may make it possible to safely dry floodproof certain residential buildings, especially where the floodproofed elevation is only slightly above grade, or for those buildings where only a portion of the residential floor is below the DFE and where adding a means of emergency egress above the DFE may be feasible.

Develop guidance for retrofitting attached buildings

Existing FEMA guidance is focused on detached buildings, making many of the regulations difficult to apply to the numerous attached buildings found in New York City. Current regulations such as the requirement to fill basements and cellars to the lowest adjacent grade or to dry floodproof commercial spaces, present structural challenges, as discussed above. Elevating a building that shares one or two party-walls is difficult and often costs more than the value of the building, making retrofitting investments unlikely.

Guidance for attached typologies should take into account challenges related not only to the structure but also to its site and context, such as sites where the rear yard is located at a lower level than street grade, complicating the ability of floodwaters to drain passively from the site. This research may lead to more cost-effective solutions for building owners as well as potential strategies to jointly improve multiple contiguous buildings.

Develop guidance for retrofitting mixed-use buildings

Existing FEMA regulations are not designed to provide solutions for mixed-use buildings. Retrofit strategies are constrained by use and in many cases can work against each other when they need to be applied side by side on the same floor. In New York City, which contains many mixed-use buildings, this translates in wet floodproofing a residential lobby and dry floodproofing the adjacent commercial space. In order for these strategies to perform, the partition/wall separating the two spaces needs to be strong enough to withstand unbalanced hydrostatic loads, which may require reinforcement. Additionally, the wet floodproofed residential lobby needs to be large enough to accommodate the expected volume of water and therefore may need to be reconfigured or widened. Guidance for mixed-use buildings should take into account these challenges and offer solutions that minimize structural reinforcement and redesign of spaces. Developing one single consistent retrofit strategy for mixed-use buildings is critical to protecting many urban buildings.