

Building Code/ Zoning Improvements

Feb 28, 2013

The Storm After the Storm: Creating a More Resilient Environment

Initially, this presentation was concentrating on nuts and bolts issues. As the thinking progressed, it became apparent that larger decisions involving programmatic/ systemic issues and solutions were just as critical if not more so and needed to be addressed as well. Perhaps it is just a battle between short versus medium versus long- term resolutions.

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I Building Code Issues

A. Administration

- One to one replacement is allowed. If total system replacement is desired/required then latest codes need to be complied with. DOB is giving determinations.
- If a space is non-complying, such as a finished basement, this can be replaced. But if it is unfinished it can't be improved. A boiler room would be replaceable. One cant increase the degree of non conformity.
- Provide a 24-month grace period for homeowners, businesses, multiple dwellings, Hospitals etc with some mechanism for delays due to FEMA payout and material shortages.
- Insurance rates will be the driver in determining height above freeboard.
- Structures that require rebuilding if the replacement cost is more than 50 percent of its market value, the design professional needs to make a determination whether it will be dry proofed or wet proofed. Calculations/diagrams as well as special inspections showing compliance need to be provided.

B. Construction

- Deep foundations (piles) required in scouring zones. Same old foundations can't be used.
- Illegal structures/illegal uses. Illegal structures need to conform to code and have to be evaluated on a case-by-case basis by the Department of Buildings.
- Requirements to wrap above flood plain parking with active uses might encourage uses vulnerable to flooding. Maybe it is good to permit parking at lower floors because cars can be removed before a storm.
- Building systems should not be permitted in basements/cellars in Zone V and A.
- Active ground floor features (ie glass requirements) may cause additional flooding issues in the flood plain. Requirements for breakaway panels etc need to be considered.
- Accessibility: If first habitable floor (ie FEMA Definition of Ground Floor) is more than 2 feet above grade then accessible lifts should be permitted. The NYC DOB currently doesn't allow their use.

- FEMA maps are to be considered the standard going forward with no probationary period- as the insurance companies are considering them valid effective immediately. How does the community react to a rising flood plain? Over the next few months there will be some adjustments.
- Permit portable flood barriers to be manually installed at buildings when flooding conditions exist, as long as either the building is vacated, or that particular entry is not considered a means of egress. This can be for both existing and proposed structures.
- To lessen fire risks, exterior walls for combustible construction need to be made fireproof.
- Provide a second floor egress in stairs in case access to grade level is not possible.

C. Plumbing/ Mechanical/ Electrical

- All oil tanks, hot water heaters, boilers, propane tanks need to be bolted down and provided with a quick disconnect that is located above the flood plain. Perhaps create shells to place over these units to keep water from getting in (sort of a diving bell). Same with electric service, or water proof rooms. This is for existing buildings where less than 50 per cent of the system needs replacing. If more than 50% then the system needs to be removed to 5 feet above the flood plain. However, insurance premiums will be the trigger for the design guideline more than any code.
- Critical Institutional Buildings. The back up generators, the fuel supply, the wiring and the back up electric service all need to be protected in a systemic fashion, not just parts of the system. Best protection is to have these critical systems five feet above freeboard. Additionally, there should be battery back up emergency lighting in addition to the emergency generators.
- Hospitals, nursing homes in Zone A and Zone B should have emergency generators in operating condition or not be allowed to reopen. There should also be passive systems that can move people/material. Require a manual lift – hand powered dumbwaiter which could be used in case of power failure so people can be evacuated in place.
- Rebuilding existing structures as is should still require certain changes- rubber seals on the septic system, rubber gaskets in wall penetrations (at dry proofing situations), relieving openings (for wet proof situations), raise the sump pump line above the Base flood plane. Raise mechanical equipment regardless see above.

- Buried gas tanks should be topped off prior to storms arrival. This will lessen the tank buoyancy.
- All new equipment whether to replace existing or new needs to be installed above flood plain electric, fire safety, etc. Vent outlets need to be placed above flood plain. Electric service needs to have an automatic disconnect that can be accessed and needs to be located above the flood plan plus 6 foot freeboard. Building codes and new requirements apply only to future construction or to be retrofitted in old buildings in Zones A and B.
- Where electric service is below flood plain, an intercept point should be provided convenient to street level for connection of a temporary generator to major distribution feeders serving floors above the flood plain. This will provide for easier power restoration after a flood and also limit the amount of cable needing replacement if submerged.
- Oil tanks, instrumentation etc in flood zone need to be waterproofed in a systemic fashion. These should not be allowed in 1,2,3 family units as homeowners will do 'repairs' that will compromise the envelope. These need to be relocated to the roof.
- Where electric service equipment is above the flood plain- waterproof the incoming Con Ed Service and cables to the service equipment.
- Should BX be replaced with Romex in Flood Zones? Much easier to work with outside of the City.
- Mandate installation of backflow valves on waste and storm lines in flood zones.
- Where domestic water to a building is provided through a constant pressure pumping system, a bypass line to allow limited domestic water supply to a building in case of power loss. Also better prep- fill tubs beforehand etc.
- Sprinkler systems in flood zones need to be studied. Higher floors can be occupied. Above the sixth floor gravity fed systems will not work. These have to be serviced by roof tank storage system.
- Expand requirements/redundancy for emergency generators. These should be placed above the flood plain.
- At what height freeboard? Benchmark should not be the FEMA elevation per se. The determinant should be the height that will trigger insurance

increases. Residential is considered to be 2' above FEMA elevation.

II Zoning Code Issues

- If more than 50% of the value of the home is destroyed then it needs to conform to new codes. Many of the houses destroyed were of stick construction and are inside a fire district and thus can't be rebuilt in wood. Rebuilding should not occur in V and A zones with the exception of elevating the structures. Building in V zones should be discouraged.
- Destroyed buildings may not comply with current codes if rebuilt as is- side yards rear yards, parking, and illegal structures. Illegal structures need to be legalized. If more than 50 percent of the market value of the structure has to be rebuilt, then compliance with current building and zoning codes is required.
- As the flood plain elevations have changed, homeowners will have a hard time getting insurance and/or a mortgage. If they pay cash, they may not care- but the person they will be selling to in the future will care. Additionally, if a homeowner accepted FEMA money at one point- no matter the amount, if they remain uninsured, they will not be able to get additional FEMA funds, which might come as an unpleasant surprise after a major incident.
- Definition of height should take into account its elevation or freeboard (of up to six feet) above the flood plain. New maps say that now have to elevate house one foot above current regulations, maybe we need to say 2 to 3 feet
- Mechanical, boiler and electric rooms to be deducted from floor area if placed above habitable floor for a maximum of 100 sf. No deduction would be allowed if below ground floor, which would only be permissible if dry proofed (this would not apply to one and two family dwellings where dry-proofing would not be allowed).
- For existing structures where the lowest level can't be removed, zoning relief is needed. For row houses (for example), while parking spaces can remain, the garden apartment and mechanical room need to be relocated to the roof. Thus, a 600 square-foot garden apartment becomes a penthouse and the remainder of the roof becomes a terrace. The amount of mechanical space required is only about 30 to 40 square feet- maybe less if instantaneous hot water boilers are to be used. Additionally, solar-powered hot water heaters can be used, which would be convenient in a black out. These penthouses could be accessed from rear stair towers. These would be rear yard obstruction for which zoning relief would be required. These stairs could be made of open grating and glass walls to allow maximum light, and allow a boat to be able to pull up at a landing with 2 foot freeboard to be able to evacuate people. The

penthouse should be placed on the back of the structure providing 10 to 15 feet minimum setback from the building face so that the street plane is not affected by the new structures.

III Evacuation Risk Occupant Issues

- Where do the displaced go? Back up plans to evacuation large residential structures, or evacuate in place? Need an evacuation plan per building. Probably should be managed by the FDNY. This needs to include where to evacuate to (not just an area but a designated structure, with a back up as well). High ground elsewhere in the city, out of Zone a and b
- Subsidized Housing / Nursing homes. Evacuate in place? Facilities must be designed to work without power (hand pulled lifts) and fire safety systems need to work (ie water tank dedicated to sprinkler only).
- Social Services Zoning. Identify those at risk residents (mobility issues, age etc) so that the community can arrange for transport if need be.

IV Infrastructure Issues- Educating the Government so they can educate the public

- The government needs to involve the local community- the Community Boards, Block associations, the police and fire departments as well as religious institutions. This is for preparation to post storm issues. Distribution should be made from these existing local organizations.
- This includes having the community boards send out some one to each block that will be inundated. This person should place ribbons on telephone poles at the height of the expected surge so people will be informed as to the expected height so they can make personal decisions accordingly (move cars to higher ground, furniture, pictures, etc). After the storm a “town crier” might be needed as there will be limited means of communication and this should be anticipated.
- Water and other essentials need to be at the local places mentioned above so that there are easy distribution areas...and people should be informed prior so that they will know where to go when there is no internet access.
- Educate the public where to go before hand prior to communication becomes interrupted.

- Government should also order mandatory power cuts prior to an event.
- Government should also create areas that people can move their cars to –roof top parking lots of malls (that have manual gate operation option in case of no power) as well as to identify possible mass car relocations. Along the median on Ocean Parkway, above grade parking garages, etc.
- Electricity and gas should be cut prior to the storms impact - at the coast (flood damage) and inland (tree damage).
- A Disaster Czar needs to provide guidelines for building owners and managers as well as single-family homes to check and to understand what to expect.
- This czar would need to advise building owners and managers (this includes the utilities) how high to make barriers, and be ready to send in the National Guard once power has been cut to prevent looting and to make sure that people do evacuate.
- Gas stations should be required to have back up generators and these systems should be located above the flood plain level.
- Maps need to be coordinated between NYC and FEMA. Designations should be similar. NYC should adopt FEMA designations.
- Electric system-wiring, connections, etc should be thought of systemically and should be raised to the second floor-for all buildings whether new or existing in the flood zones.
- Power Grid should be diversified- Klaus Jacobs and others have more systematic recommendations but this is huge and long range though essential
 1. Primary- Street lights
 2. Secondary- Gas stations, Hospitals and coordination centers
 3. Cellular tower
 3. Residential/ commercial facilities

V Zoning and Planning Long Term Thoughts

- Rethink PLANYC as to whether NYC can accommodate more people. If so, it has to be on less land. Density has to be rethought so as to promote it but n less land since we are losing land to storms and should retreat to some extent?/ draft

- List significant requirements that are on books now conflict with essential new post-Sandy requirements and have to establish priority on conflicts with special multiagency entity to suspend or review?
- What trade offs, how to have active street front if buildings have to be raised.
- How can new zoning in disaster world to protect landmarks and historic districts and yet reduce risks
- Protection, for some areas, accommodation for others, retreat and restoration for others, differentiate and be hard nosed about it
- Rethink waterfront development as priority for residential uses
- Many NYCHA buildings in flood planes, special needs, planning and so much of industrial base
- Need to put communities front and center in rebuilding, planning restoration; some maybe willing to retreat but it has to their decision
- Revise EIS immediately to require hazard analysis and mitigation