Flood Resilience Zoning Text
Gowanus Sustainability & Resiliency Meeting #3
April 20, 2017
A more resilient NYC is one where neighborhoods, buildings and infrastructure can withstand and recover quickly from flooding and climate events.

Coastal defenses are strengthened as first line of defense against flooding and sea level rise.

Buildings are designed to withstand and recover from flooding.

Infrastructure is protected from climate hazards.

Residents and businesses are prepared.
Types of Flood Risk
Stormwater vs. Coastal Storm Surge
NYC’s flood risk is high.
The floodplain affects a large geography and most community and council districts.

1% Annual Chance Floodplain
FEMA 2015 PFIRM

Population: 400,000
50 of 59 Community Boards
Buildings: 71,500
45 of 51 Council Districts

Buildings:
- 80% 1-4 units
- 7% 5+ units
- 13% nonresidential

Residential Units:
- 30% 1-4 units
- 70% 5+ units

2013 FEMA Preliminary Flood Insurance Rate Maps (PFIRMs)
What does 1% annual chance mean?

- Also known as the 100yr Floodplain, but it does not mean it happens only once every 100 years;
- There is a 26% chance of flooding over the life of a 30-year mortgage.

Hurricane Sandy wasn’t a 1% storm – in some places, it was more significant (Brooklyn); in others it was less (Bronx).
How are buildings in the floodplain regulated?

Flood Insurance Rate Maps
Determine where floodplain regulations apply

National Flood Insurance Program
Rates encourage building elevation and other retrofits

Building Code (DOB)
Code requires new buildings and substantial improvements to meet FEMA standards

Zoning Resolution (DCP)
Zoning accommodates these regulations and improves neighborhood character
FEMA Flood Map

Flood Insurance (FIRM)
- NYC adopted FEMA’s Flood Insurance Rate Maps (FIRMs) in 1983 when it joined the NFIP program;
- This is still the map used today for flood insurance purposes.

Building Code Requirements (PFIRM)
- In 2013, FEMA release preliminary maps (PFIRMs) which is used today for planning purposes:
  - Building Code is required;
  - Special Zoning regulations is available.
Flood-resistant construction
Required by DOB

- **FEMA** requires buildings to elevate above or floodproof below flood elevation.
- **Freeboard** is additional elevation required by Building Code for safety.
- Category II: 1+2 family dwellings +2 ft
- Category II + III: Multifamily dwellings, schools, infrastructure +1 ft
- Category II + III: Fire or rescue stations, shelters, toxic storage +2 ft
- Category III or IV: Hospitals regardless if small or large +2 ft (or 500yr)

A Zone

DNF PLANNING
Flood-resistant construction
Required by DOB

Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the design flood elevation (DFE).

- Living spaces are elevated above DFE
- Mechanical systems are elevated above DFE
- Site is filled to lowest adjacent grade
- Use below DFE is restricted to parking, storage or access
Flood-resistant construction Required by DOB

Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the design flood elevation (DFE).

- Mechanical systems are elevated above DFE.
- Site is filled to lowest adjacent grade.
- Use below DFE is restricted to parking, storage or access.
- Living spaces are elevated above DFE.
Flood-resistant construction Required by DOB

Flood resilient construction standards allow commercial buildings to dry floodproof the lowest floor, as well as mechanical equipment, below the design flood elevation (DFE).
Flood-resistant construction
Examples of Residential Buildings

Residential Building with access at grade (wet-floodproofed)

Residential Building elevated to DFE
Flood-resistant construction
Examples of Commercial Buildings

Commercial Building with access at grade (deployable flood shields)

Commercial Building elevated to DFE
Flood resilience zoning
Projects at DCP

2013
“Flood Text”
initial temporary regulations
to facilitate recovery

2018
“Flood Text II”
improve upon, and make permanent, the Flood Text
2013 Citywide Flood Text
Amended zoning in six key areas

1. **Height**
   Measured from flood elevation

2. **Access**
   Flexibility for stairs, ramps, lifts

3. **Parking**
   Flexibility to relocate parking

4. **Systems**
   Flexibility to relocate/elevate

5. **Ground Floors**
   Account for costs of new flood risk

6. **Streetscape**
   Require features to mitigate blank wall
Flood Text II
Fix and improve provisions based on lessons learned

1. **Height**
   Homeowners may face the loss of subgrade spaces when retrofitting.

2. **Height**
   Properties owners may want to address future risk by over-elevating.

3. **Ground Floors**
   Current incentives to keep active ground floors may not be enough.

4. **Homes in M Districts**
   Existing homes in M. Districts, if damaged, may not be able to rebuild.
Flood Text II
Outreach

DCP plans a robust public engagement process:

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Community Outreach → Scoping / ULURP

As part of this outreach process, DCP will:

- **Partner with stakeholders** to educate and promote awareness of flood risk and resiliency issues
- **Explain how zoning tools** relate to resiliency
- **Explore unique neighborhood issues** through in-depth public presentations and workshops
- Develop a proposal through an **iterative process** that is shaped by feedback

* Schedule is tentative and subject to change
Outreach Resources

NYC Flood Hazard Mapper

www.nyc.gov/floodhazardmapper

Info briefs on Flood Resilience Zoning, Flood Risk, Flood Resilient Construction, and Flood Insurance

www.nyc.gov/resilientneighborhoods
Thank you!

For more information, and to stay involved, email resilientneighborhoods@planning.nyc.gov
Flood insurance rates
Set by FEMA

Raising or retrofitting your home will reduce costs

FEMA’s flood insurance premiums are lowest when the lowest inhabited floor (any area not used solely for storage, access or parking) is elevated above the Base Flood Elevation (BFE).

- 4 FEET OR MORE BELOW BFE: ~$9,000 Annual premium
- AT BFE: ~$1,400 Annual premium
- 3 FEET OR MORE ABOVE BFE: ~$450 Annual premium
Flood resilience zoning
Projects at DCP

2013
“Flood Text”
initial temporary regulations to facilitate recovery

2015 “SRNR”
additional zoning relief to expedite recovery

2018
“Flood Text II”
improve upon, and make permanent, the Flood Text
Flood Text II
Fix and improve provisions based on lessons learned

1. **Height**
   - Homeowners may face the loss of subgrade spaces when retrofitting.

2. **Height**
   - Property owners may want to address future risk by over-elevating.

3. **Ground Floors**
   - Current incentives to keep active ground floors may not be enough.

4. **Homes in M Districts**
   - Existing homes in M. Districts, if damaged, may not be able to rebuild.

5. **Old Homes in Small Lots**
   - Old bungalow homes on small lots may need more flexibility to rebuild in the future.

6. **Highly Vulnerable Areas**
   - Density may need to be limited in highly vulnerable areas.
Flood Text II
Lesson learned: Cellar and Residential living space lost

**EXAMPLE ISSUE**

The 2013 Flood Text allowed for adjustment of “zoning envelopes” to facilitate the retrofitting and replacement of living space above the DFE, out of harm’s way, but this flexibility applies unevenly:

**Case study 1:** Replacement of ‘cellar’ story in a high-DFE retrofit

**Case study 2:** Loss of living space in a low-DFE retrofit
Flood Text II
Lesson learned: FAR incentive to retrofit buildings not effective

EXAMPLE ISSUE

The 2013 Flood Text allowed for floodproofed space to be exempted from floor area to incentivize the retrofitting of existing buildings but had the following issues:

• Analysis of DOB permitting indicates this incentive likely has not been used since it was introduced.

• Restrictions accompanying this flexibility (only applies in certain districts, up to 10,000 sq. ft., C space cannot be replaced atop R, prohibition against creating new units, requirement to provide new parking spaces) may be too onerous.

• Only applies to existing buildings – not new buildings.
Flood Text II
Lesson learned: Desirable ground floor retail not being provided

EXAMPLE ISSUE

The 2013 Flood Text redefined “cellar” to exempt at-grade stories to incentivize the retrofitting of existing buildings but had the following issues:

• Bad urban design outcomes due to “squishing” – dark, low-ceilinged establishments.
• Causes lower-grade commercial stock, limits the types of retail tenants and services that can locate in the building, such as restaurants.
• Doesn’t apply to [at least half] of the floodzone.
• Doesn’t create a zoning incentive to prefer dry floodproofing implementations over wet floodproofing (active over passive).

Example of ‘squished’ retail
(1809 Emmons Ave., BK)
Flood Text II
Lesson learned: Additional height not permitted for future flood projections

**EXAMPLE ISSUE**

The 2013 Flood Text doesn’t provide zoning relief for accommodating future flood risk

- Zoning relief is “minimum necessary” to elevate only to the DFE – nothing higher.

- Some building owners may want to take sea level rise, future flood heights, or more powerful storms (e.g., Hurricane Sandy) into account when building. No incentives.

- Close coordination is necessary to align zoning with FEMA “Climate Smart” maps.
Lesson learned: Cottage envelope is not permanent

**EXAMPLE ISSUE**

The 2015 SRNR created a new contextual envelope to facilitate the reconstruction of the very small homes on small lots, however these rules were temporary:

- Not available permanently (past 2022)
- Doesn’t apply outside of “Neighborhood Recovery Areas”
- Doesn’t prevent “candlesticks” on currently vacant lots

**Currently allowed**
Minimum 5’ sideyards
21’/35’ height
✓ Fits 0.6 FAR

**Proposed Envelope**
Minimum 3’ sideyards
19’/25’ height
✓ Fits 0.6 FAR
Lesson learned: Not all existing buildings were grandfathered

EXAMPLE ISSUE

To facilitate the recovery of non-conforming and non-complying homes, the 2013 Flood Text gave greater relief to these homes, but 500+ residential buildings in C8/M Districts were left out.

- **Underlying Article V** rules always allow 1+2 family homes to be rebuilt, regardless of level of damage, except R in C8/M
- **FT I** allowed any non-conforming building damaged >50% by Hurricane Sandy to rebuild, except R in C8/M