Flood Resilience
Text Amendment II

Presentation to the Resilient Red Hook Committee
July 10, 2017
Citywide Resiliency Outreach

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- **2016**: Identify key stakeholders, including local and citywide organizations and elected officials.
- **2017**: Brief CBs and other groups on resiliency and zoning issues, prepare for more in-depth conversations.
- **2018**: Public presentations and workshops on the zoning issues and options for addressing them.

*Schedule is tentative and subject to change*
RETI Center Workshop - June 17, 2017

**STEP 1**
Pick a building in your neighborhood: it can be the place you live, work or are interested in!

**STEP 2**
Build the existing conditions of your building with available cut-out cards (black and white).

**STEP 3**
Place your flood elevation (low, medium or high) above existing building and check your risk!

**STEP 4**
Retrofit your building to become resilient by using available cards (colored).

**STEP 5**
Add the zoning envelope that reflects your neighborhood’s zoning above the flood level.

**STEP 6**
Check if there are any zoning conflicts: does the retrofitted building fit within the envelope?

**STEP 7**
Add your building to the wall and imagine how your neighborhood could look like!

**STEP 8**
What do you think about the results? Add a post-it with your thoughts on the wall!
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.
Flood Resilience Zoning Projects at DCP

2013
“Flood Text”
initial temporary regulations to facilitate recovery

2018
“Flood Text Update”
improve upon, and make permanent, the Flood Text
NYC’s flood risk is high.

The floodplain affects a large geography and most community and council districts.

100 Year Floodplain
FEMA 2015 PFIRM

Population: 400,000
Buildings: 71,500

50 of 59 Community Boards
45 of 51 Council Districts

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

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

FEMA Flood Map
Citywide Flood Risk

Projected 2050s (Future 100 Year FZ)

FEMA 2007 FIRM (used for Insurance)
FEMA 2015 PFIRM (Building Code/Zoning)
Projected 2050s (Future 100 Year FZ)
Future Flood Risk
Flood Risk in BK CB 6

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<tr>
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<th>2015 PFIRMS</th>
<th>2050’s Projected</th>
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<td>R units in floodplain</td>
<td>6,067</td>
<td>8,856</td>
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<tr>
<td>Buildings in floodplain</td>
<td>1,308</td>
<td>2,096</td>
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46% increase in R units
60% increase in buildings
How are buildings in the floodplain regulated?

Flood Insurance Rate Maps (FIRMs)
Determine **where floodplain regulations apply**

National Flood Insurance Program
Set up Insurance Rates depending on building elevation and other requirements

Construction Standards (ASCE 24)
Design minimum construction requirements for flood hazard areas

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

Zoning Resolution (DCP)
Zoning accommodates these regulations and improves neighborhood character
Flood resilient construction
Required by DOB

**Required** for all **new** buildings

**Not required** for **existing** buildings
(unless substantially damaged or improved)
Flood-resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the design flood elevation (DFE).

- Site is filled to lowest adjacent grade
- Use below DFE is restricted to parking, storage or access
- Mechanical systems are elevated above DFE
- Living spaces are elevated above DFE
- WET FLOODPROOF (Water comes in and out)

Building Code (DOB)
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

Residential Lobby

WET-FLOODPROOF

Building Code (DOB)
Flood resilient construction
Examples of Residential Buildings

Residential Building with access at grade (wet-floodproofed)

Residential Building Elevated to DFE – 3’ above grade
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 resilient construction
Dry-floodproofing techniques

Deployable floodgate
(currently allowed only at doors and operable windows)

Aquarium Glass
(‘aquarium-grade’ glass for glazing or curtain-wall systems)
Flood resilient construction
Examples of Commercial Buildings

Commercial Ground Floor
Existing Building with access at grade (deployable flood shields)

Commercial Ground Floor
Elevated to DFE – 2.5'
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
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
### DOB Permit Filings
in the flood hazard area, 10/2013 – 1/26/2016

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<th>NB 1,021</th>
<th>Alt-1 1,090</th>
<th>Alt-2 15,573</th>
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**Construction/retrofitting activity in the flood zone:**

The zoning relief we provided may not be achieving our goal of increasing code-compliant, flood-resistant projects.

**Lessons learned since 2013**

- **Zoning Resolution (DCP)**
Flood Text II
Need for a new citywide text amendment:

1. Make the provisions of the current, temporary 2013 Flood Text permanent

2. Fix and improve provisions based on studies and lessons learned in six key areas

3. Begin to promote new development + proactive retrofitting to high resiliency standards

4. Encourage good resilient construction that enhances the character of coastal communities
DCP’s approach to future zoning + land use strategies

**Limit**
Zoning and other tools should limit exposure to damage and disruption by limiting the density of future development.

**Accommodate**
Adjust zoning to allow buildings to retrofit, by providing flexibility and removing obstacles to resiliency investments.

**Encourage**
Encourage construction of new development built to a higher standard of flood protection.

Where flood risk is exceptional, including where sea level rise will lead to future daily tidal flooding.

Where risk from extreme events can be managed and infrastructure and context support growth.

*stakeholder input factored into zoning and land-use strategy throughout*
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 homes on small lots may need more flexibility to rebuild in the future.

6. **Improve Streetscape**
   Mitigate the effects of elevated buildings on neighborhood character.
### Citywide Resiliency Outreach

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**Advance Outreach**

- Identify key stakeholders, including local and citywide organizations and elected officials.
- Brief CBs and other groups on resiliency and zoning issues, prepare for more in-depth conversations.
- Public presentations and workshops on the zoning issues and options for addressing them.
- Public presentations on full draft proposal in advance of formal ULURP process

**Scoping / ULURP**

*Schedule is tentative and subject to change*
Thank you!

For more information, and to stay involved, email resilientneighborhoods@planning.nyc.gov

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212-720-3268  

Manuela Powidayko
mpowidayko@planning.nyc.gov
212-720-3344
Appendix
The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation.

Where flood elevations-above-grade are moderate, additional height is given to ensure that large spaces beneath buildings can be utilized effectively:

1+2 Family Homes: 3' (6’ > 9’)  
Commercial Buildings: 7' (5’ > 12’)  
Multifamily: 5' (5’ > 10’)
The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation. **ISSUE**

- Should apply more broadly to single-family homes
- Should apply more extensively to large building due to the unique access issues they face
- Does not address the loss of subgrade space (which is expensive to preserve in the flood zone)
The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation.

**ISSUE**

- Prevents certain access solutions in “packed” envelopes

**Without**
- bump-up

**With**
- bump-up
The 2013 Flood Text also allowed existing 1+2 family homes to be physically raised to the DFE.

- Even if these buildings were non-compliant, they were permitted to be raised regardless of height, yard, floor area, and other regulations.
The 2013 Flood Text also allowed existing 1+2 family homes to be physically raised to the DFE.

**ISSUE**

- Doesn’t apply to **other building types**
  (3 family homes, larger multi-family buildings, non-residential buildings)

- Doesn’t allow the **bump-up to apply**
  (the provisions are mutually exclusive)

- Doesn’t allow elevation to any higher level (i.e., BFE+3)

- Doesn’t provide a solution for **non-raisable building typologies**.
  (more on next slide)
The 2013 Flood Text also allowed existing 1+2 family homes to be physically raised to the DFE.

**ISSUE**

- Doesn’t provide a solution for non-raisable building typologies.
The 2013 Flood Text exempted resilient entryways from floor area

- Intended to ensure that compliance with new Appendix G requirements wouldn’t constitute a penalty against development rights.
To incentivize the retrofitting of existing buildings, the 2013 Flood Text allowed any floodproofed space to be exempted from floor area:

- This space could be relocated to a new addition atop the building, (provided there is sufficient room), helping to finance a retrofit project.

**Floor Area**

**Wet floodproofing:**
- New floor area must fit within allowable building envelope
- Existing buildings may relocate wet flood-proofed floor area located below the FRCE
- Parking, storage and access are the only permitted uses for wet flood-proofed space

**Dry floodproofing:**
- New floor area must fit within allowable building envelope
- Ground floor space that is dry-flood proofed to allow commercial or community facility use may also be exempted
- Temporary flood panels are used at openings to dry flood-proof commercial and community facility space
To incentivize the retrofitting of existing buildings, the 2013 Flood Text allowed any floodproofed space to be exempted from floor area

**ISSUE**

- 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*.
To incentivize the dry floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

- Allowed up to an additional 1 FAR in areas where the flood elevation above grade is more than half of the floor-to-ceiling height.

![Diagram showing typical cellar space (Exempt from floor area) and above-grade cellar space (In flood zones where DFE > 4.6) with DFE (Design Flood Elevation) indicated.]
To incentivize the dry-floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

**ISSUE**

- 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
To incentivize the floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

**ISSUE**

- Ongoing uncertainty regarding acceptable dry floodproofing methods:
  
  **Non-NFIP compliant**
  (e.g. “Aquafence”; allowed for Pre-FIRM buildings)
  
  **Deployable floodgate**
  (currently allowed only at doors and operable windows)
  
  **Integrated floodproofing**
  (‘aquarium-grade’ glass for glazing or curtain-wall systems)
To incentivize the floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

**ISSUE**

- Ongoing uncertainty regarding acceptable dry floodproofing methods:
  - Deployable floodgate (currently allowed only at doors and operable windows)
  - Deployable floodgate (allowed at perimeter only for pre-FIRM buildings)
Grandfathering

To facilitate the recovery of non-conforming and non-complying homes, the 2013 Flood Text gave greater relief to these homes:

- Non-conforming uses were allowed to remain even if they surpassed the damage and destruction thresholds, and given more time to do so:

**Previous Rules**

- Hurricane Sandy
- House demolished
- Pre-existing house
- 2 years
- Foundations complete

**New Rules**

- New FIRMs adopted (~2018?)
- Foundations complete (~2028)
- Pre-existing house
- 10 years after new FIRMs
To facilitate the recovery of non-conforming and non-complying homes, the 2013 Flood Text gave greater relief to these homes.

**ISSUE**

- Over 500 residential buildings left out of 2013 relief:
  1. 300 1+2 Family Homes
  2. 200 Multifamily Buildings
- **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
To facilitate the reconstruction of the very small homes on small lots, the 2015 SRNR created a new contextual envelope.

- Shorter, but has a more rational layout
To facilitate the reconstruction of the very small homes on small lots, the 2015 SRNR created a new contextual envelope.

**ISSUE**

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

- Maximum NFIP premium reduction reached when house is BFE+2.5’
The current flood text doesn’t provide zoning relief to the future floodplain

- Today’s 500YR floodplain is roughly equivalent to 2050 100YR, and includes Sandy inundation area.
- Construction in this future floodplain has no special requirements or incentives.
- Close coordination is necessary to align zoning with FEMA “Climate Smart” maps.
FIRM vs. PFIRM

**FIRM**
1983; digitized 2007
Currently used for flood insurance purposes

**PFIRM**
2013, revised 2015
Currently used for building code purposes

**Post-appeal PFIRM**
Expected 2019+
Affected geography unknown

Not actual map – illustrative only
2015 Special Regulations for Neighborhood Recovery

Special rules to accelerate recovery from Hurricane Sandy.

Temporary regulations, expiring in 2020, in limited areas of Brooklyn, Queens, and Staten Island

In Brooklyn: Seagate, Brighton Beach, Sheepshead Bay, Gerritsen Beach, Canarsie
2015 Special Regulations
Accelerate recovery in Sandy-damaged neighborhoods

Provided new zoning solutions in three key areas:

Simplified process for documenting old homes

Removed disincentives such as loss of basement space

Established new envelope for rebuilds on small existing lots

(more on this later)
Urban Design Principles
The future of NYC coastal communities:

PLACE
Preserve Neighborhood Character

EQUITY
Ensure Inviting Access

DETAIL
Encourage Dynamic and Thoughtful Architecture

COMFORT
Maintain Street Vitality and Safety

Encourage good resilient construction that enhances the character of coastal communities
Red Hook, Brooklyn – Neighborhood Character

Mixed Use—
1-6 stories, commercial and residential, predominantly masonry, attached and semi attached.

Residential Streets –
3-4 stories, 1-2 family, masonry and wood frame, attached and semi attached.

Industrial Waterfront –
1-6 stories, commercial and industrial, masonry, concrete, and steel frame, attached and semi attached.

Red Hook Houses—
6 – 14 stories, 3,000 units.
Red Hook, Brooklyn – Neighborhood Character

Residential Streets –
3-4 stories, 1-2 family, masonry and wood frame, attached and semi attached.
Red Hook, Brooklyn – Neighborhood Character

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1-6 stories, commercial and residential, predominantly masonry, attached and semi attached.
Red Hook, Brooklyn – Neighborhood Character

Industrial Waterfront –
1-6 stories, commercial and industrial, masonry, concrete, and steel frame, attached and semi attached.
Red Hook, Brooklyn – Neighborhood Character

Red Hook Houses—
6 – 20 stories, 3,000 units.