

# Zoning for Coastal Flood Resiliency

## Update and Summary of Preliminary Recommendations



Update for City Island Civic

July 30th, 2019



# Hurricane Sandy



Port Morris

Source: dna.info



City Island

Source: dna.info



Hunts Point

Source: Bronx Ink



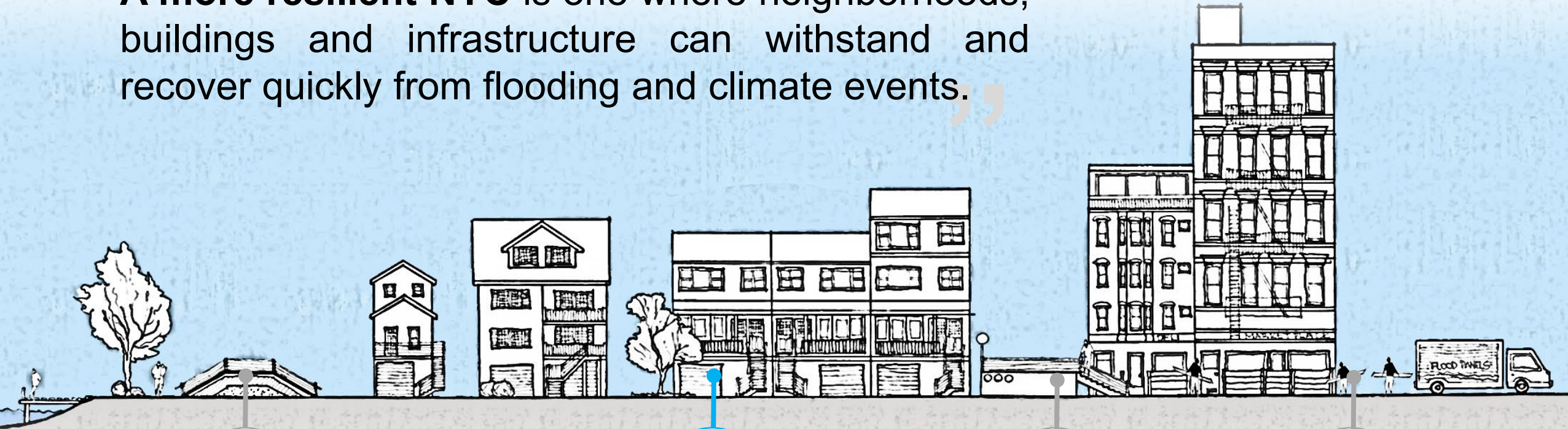
Locust Point

Source: Daily News



# #ONENYC

“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



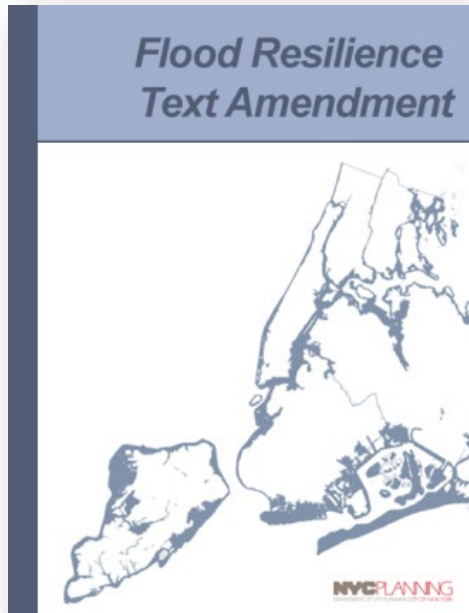
## Infrastructure

is protected from climate hazards



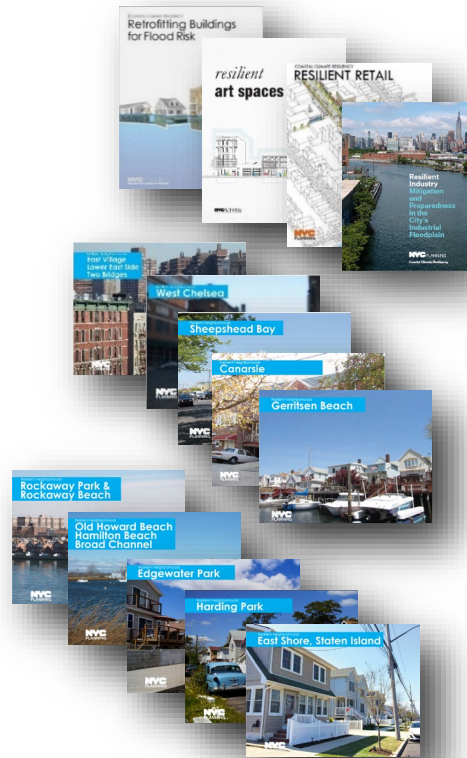
Residents and businesses are prepared

# DCP's work since Hurricane Sandy



**2015**

**Flood Resilience Zoning Text Amendment:**  
Initial temporary regulations to facilitate recovery



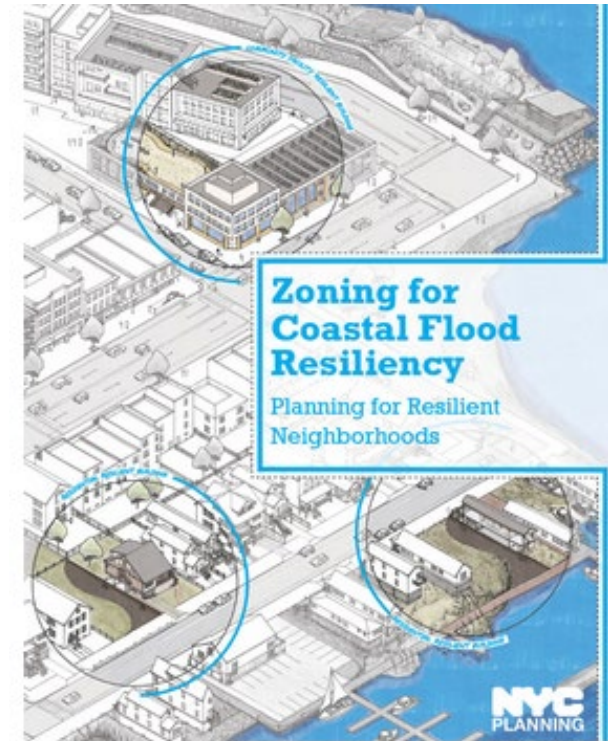
**2014-2017**

**Citywide / Neighborhood Studies**



**2016-Present**

**Community Outreach**



**2019**

**Zoning for Coastal Flood Resiliency**



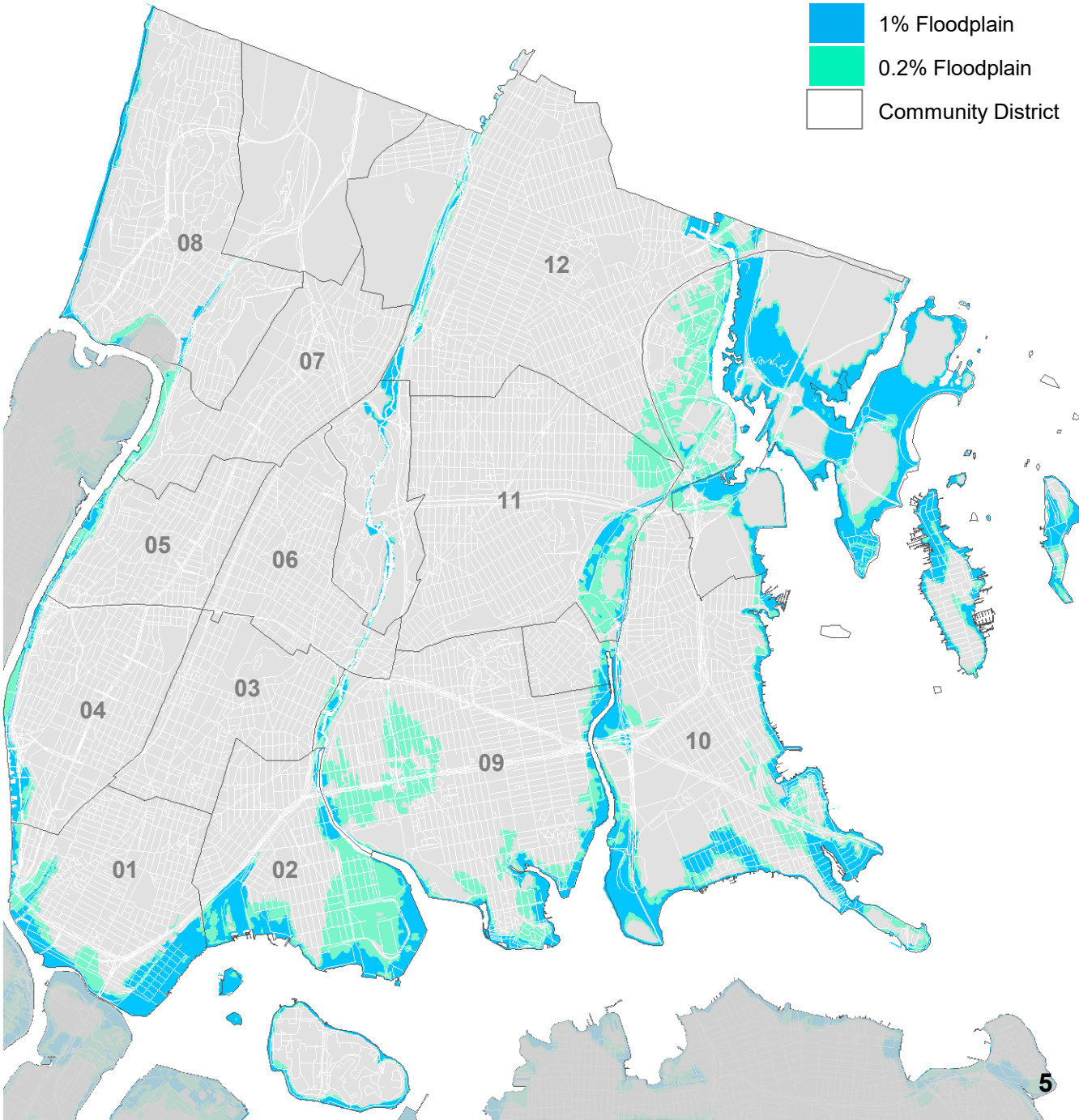
# Flood Risk in the Bronx

## NYC's flood risk is high.

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

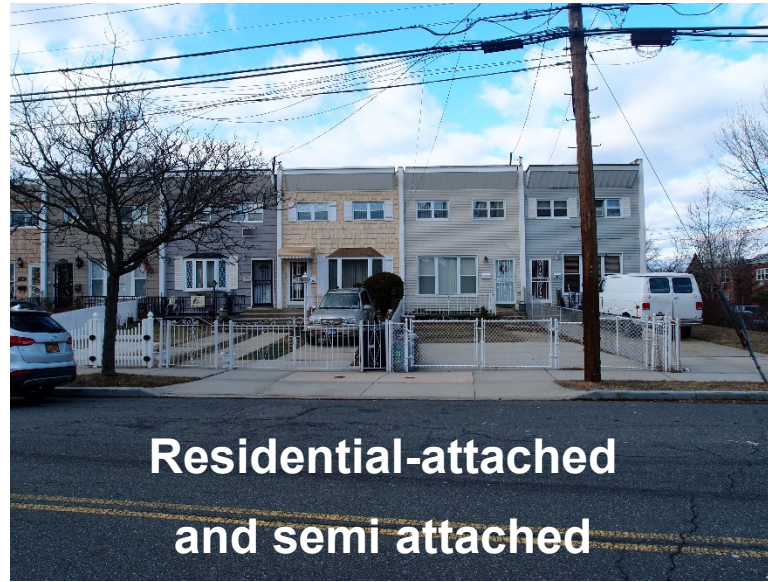
The vast majority of the floodplain is already developed.

	1% annual chance floodplain (high risk)	0.2% annual chance floodplain (moderate risk)	TOTAL
Citywide Total # of Lots	65,582	36,723	102,305
Bronx Total # of Lots	3,536	3,389	6,925
	1% annual chance floodplain (high risk)	0.2% annual chance floodplain (moderate risk)	TOTAL
Citywide Total # of Buildings	80,907	44,636	125,539
Bronx Total # of Buildings	6,055	3,922	9,977



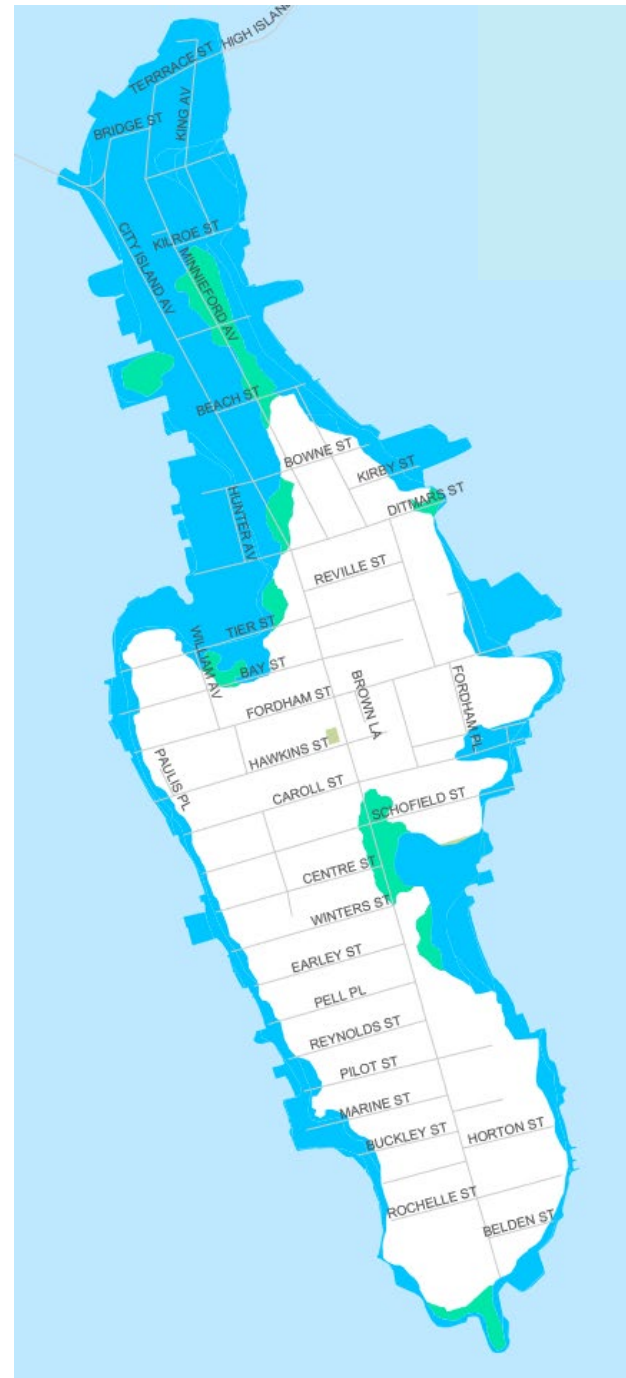




# Building typologies in the Bronx floodplain





# Flood Risk City Island:



-  1% Annual Chance Floodplain (High Risk)
-  0.2% Annual Chance Floodplain (Moderate Risk)

# How are buildings in the floodplain regulated?

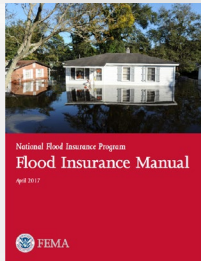


FEMA



**Flood Insurance Rate Maps (FIRMs)**

Determine where floodplain regulations apply



**National Flood Insurance Program**

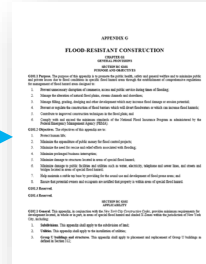
Set up Insurance Rates depending on building elevation and other requirements



**Construction Standards (ASCE 24)**

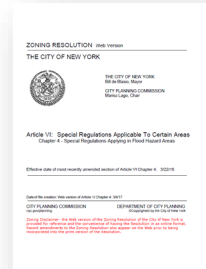
Design minimum construction requirements for flood hazard areas

NYC



**Building Code (DOB)**

Requires new buildings and substantial improvements to meet FEMA standards (Appendix G)



**Zoning Resolution (DCP)**

Zoning accommodates these regulations and improves neighborhood character

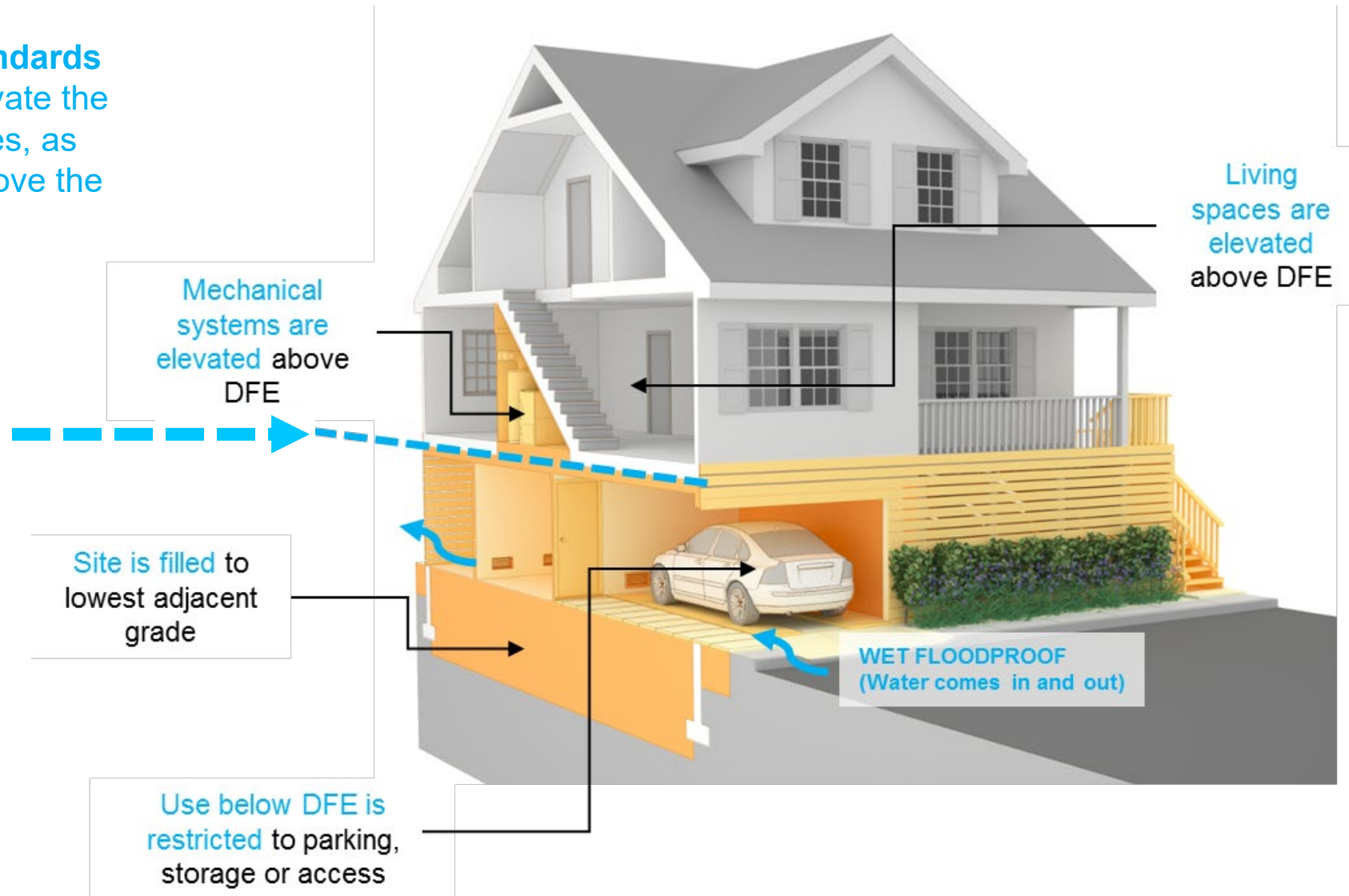


# Flood resilient construction Required by DOB

Building Code  
(DOB)

Flood resilient construction standards require residential buildings to elevate the lowest floor used for living purposes, as well as mechanical equipment, above the Design Flood Elevation (DFE).

Design Flood Elevation (DFE)

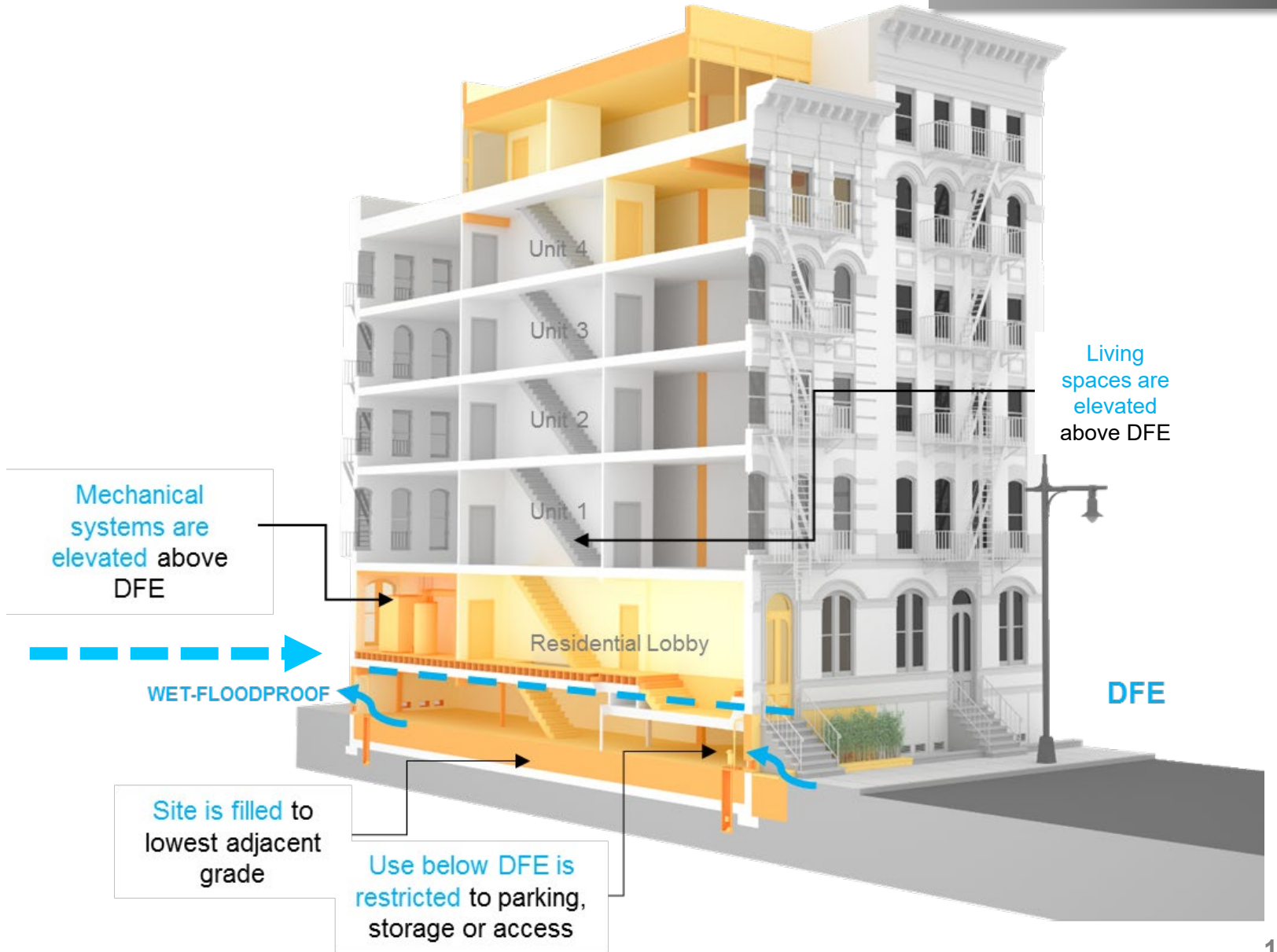


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Design Flood Elevation (DFE)





# Zoning for Coastal Flood Resiliency

## Overview of Goals

*Zoning for Flood Resiliency would provide building owners flexibility to design or otherwise retrofit their buildings to reduce damage from flooding, be resilient in the long-term, save on flood insurance costs, and expedite future-storm recovery.*



**Encourage resiliency throughout the current and future floodplains**



**Support long-term resilient design of all building types through flexibility in zoning**



**Allow for adaptation over time through incremental retrofits**

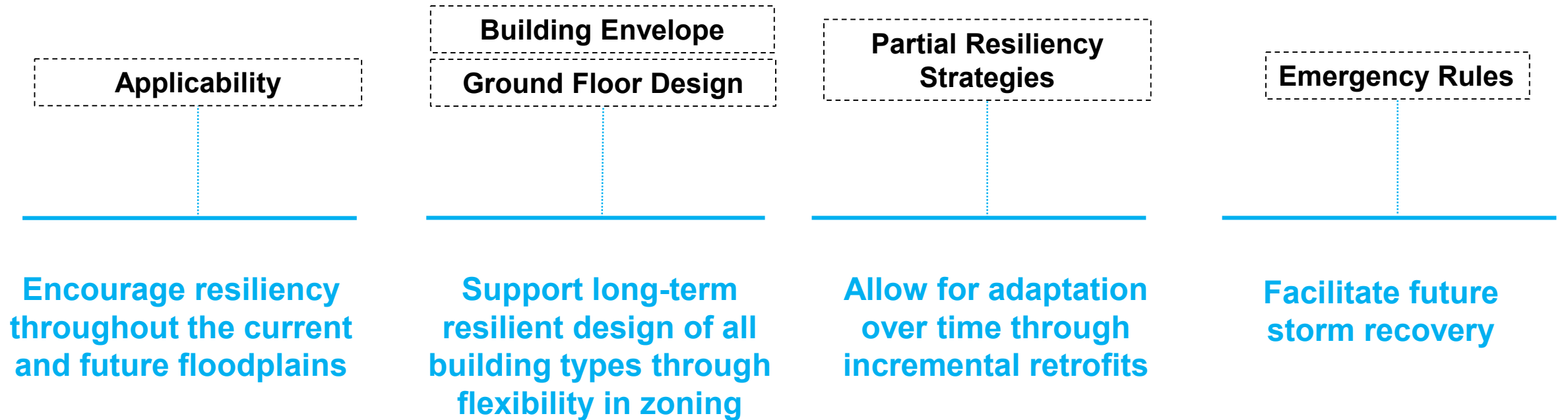


**Facilitate future storm recovery**

# Zoning for Coastal Flood Resiliency

## Overview of Goals

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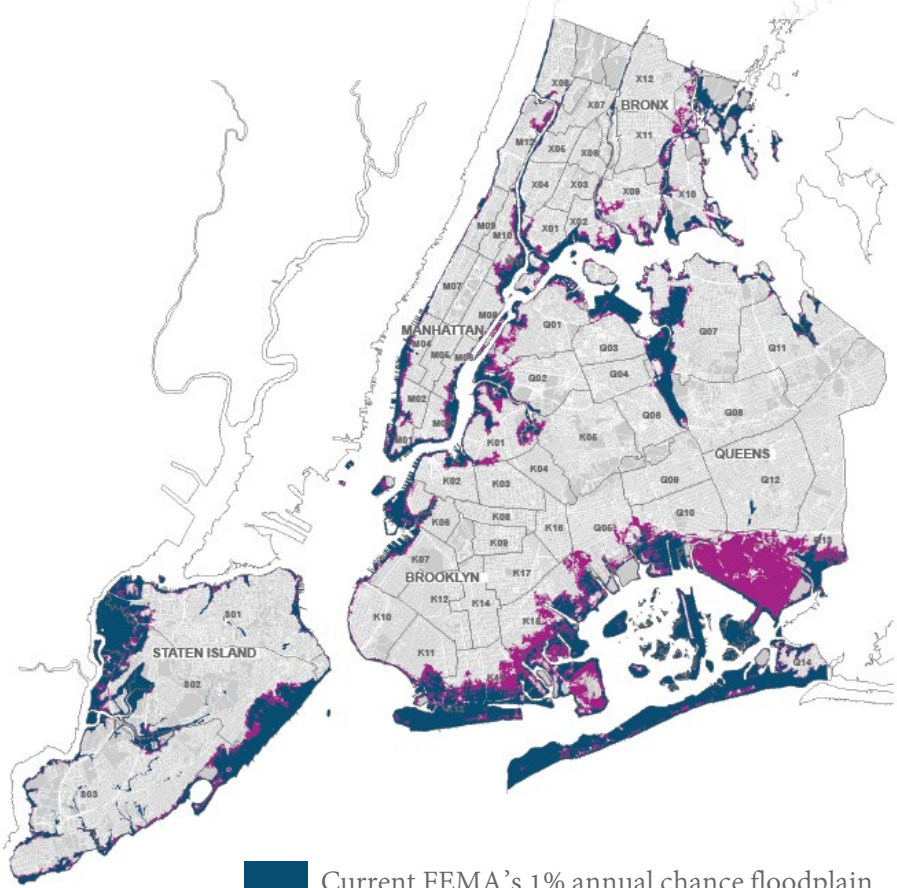
# Zoning for Coastal Flood Resiliency

## An expanded geography

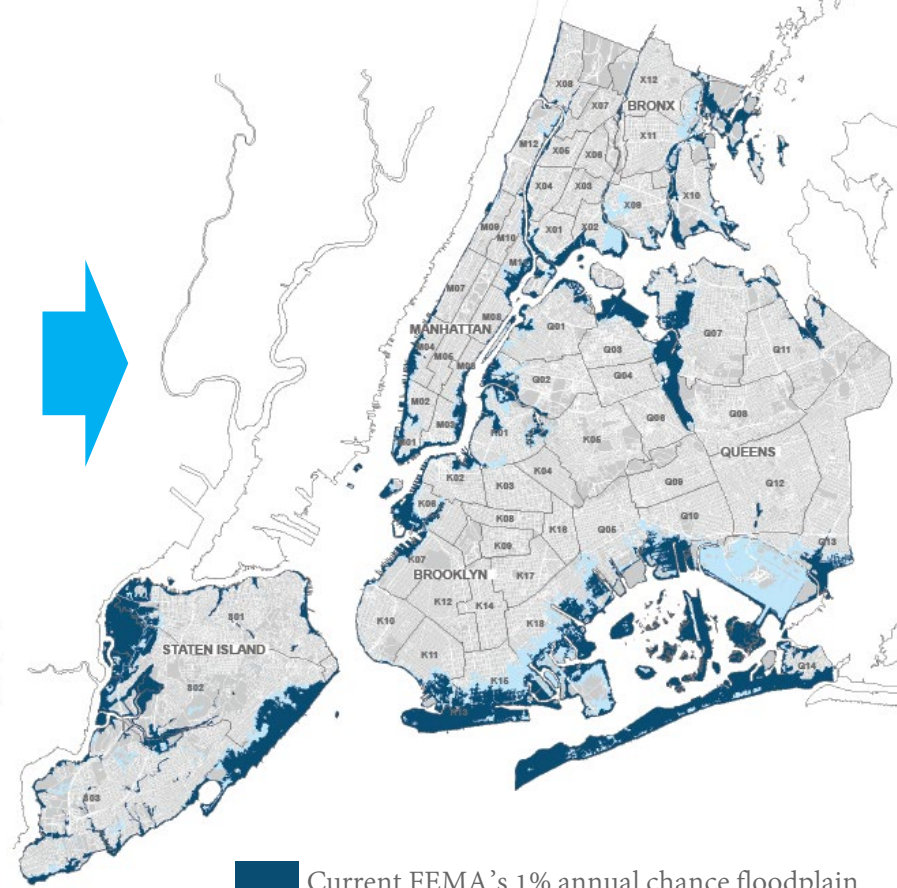
*Building owners in both the city's 1% and 0.2% annual chance floodplains would be able to invest in resiliency improvements to fully meet or exceed flood-resistant construction standards, even when these standards are not required by the Federal Emergency Management Agency (FEMA) and NYC's Building Code.*



**1. Encourage resiliency throughout the city's current and future floodplains**



■ Current FEMA's 1% annual chance floodplain  
■ 2050's 1% annual chance floodplain

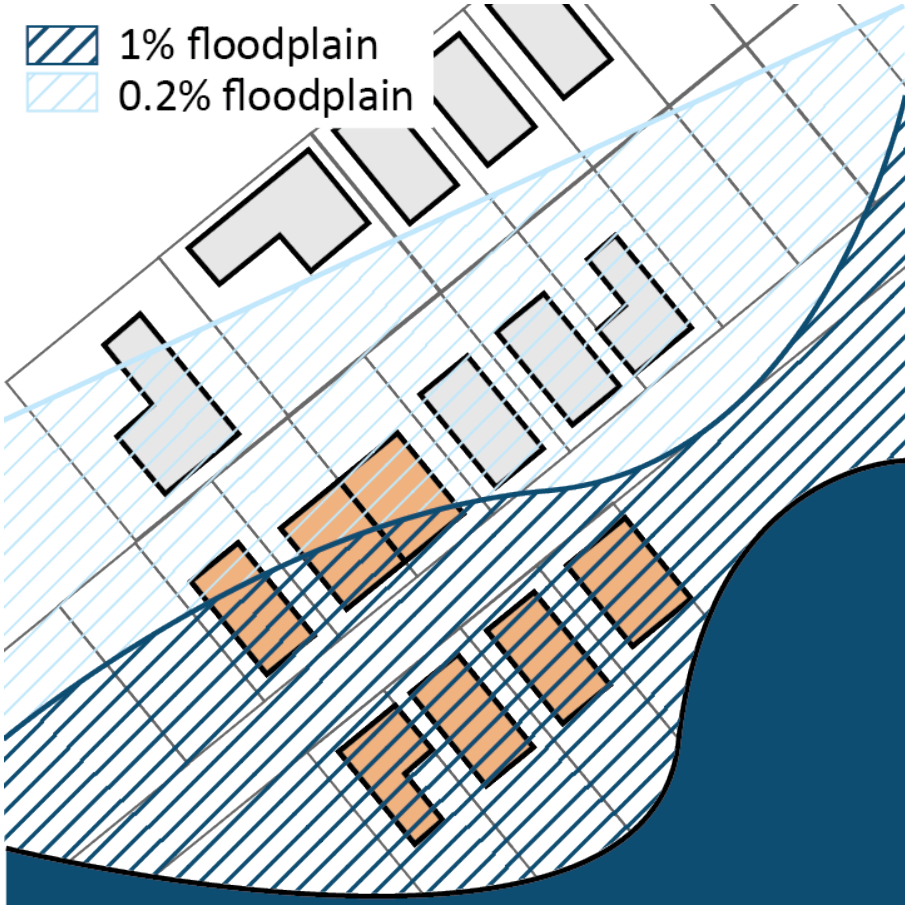


■ Current FEMA's 1% annual chance floodplain  
■ Current FEMA's 0.2% annual chance floodplain

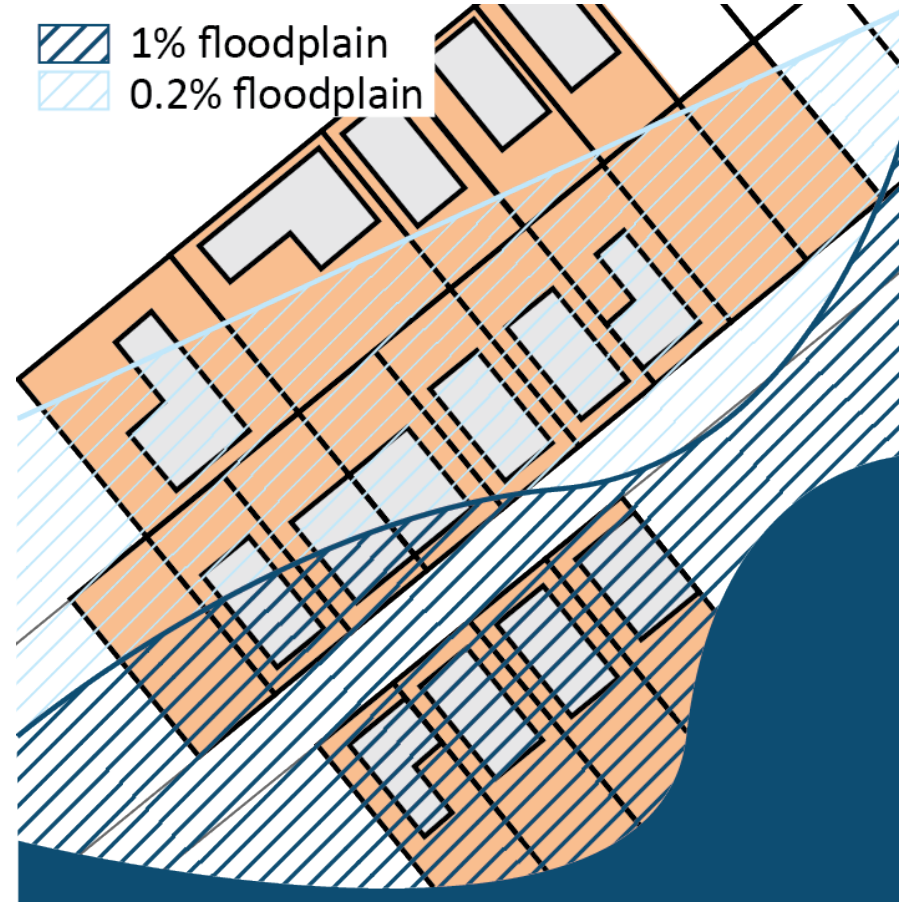
**Applicability**

**General Applicability**

**Permanent** regulations would facilitate buildings to **proactively** incorporate resiliency improvements to fully meet **or exceed** *flood-resistant construction standards* while maintaining the same allowable *Building Envelope*.



**Existing Rules:** apply to buildings within the 1% floodplain



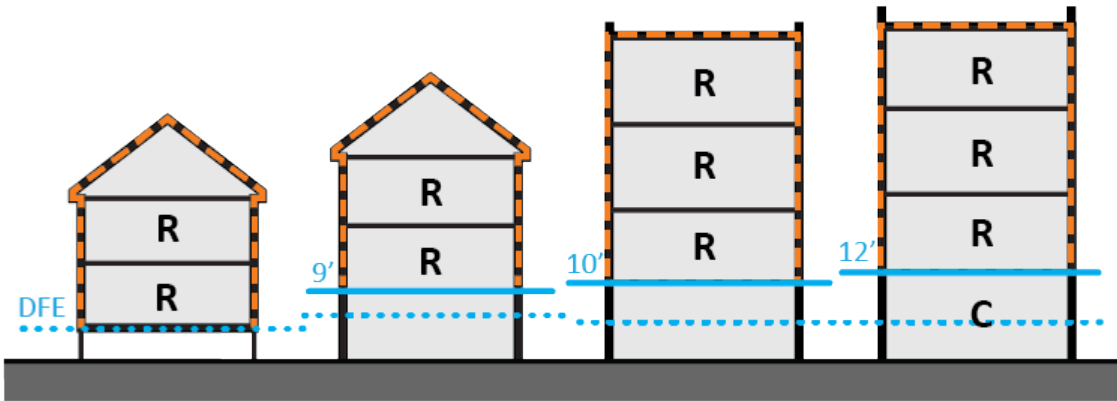
**Proposed Rules:** apply to lots within the 0.2% floodplain



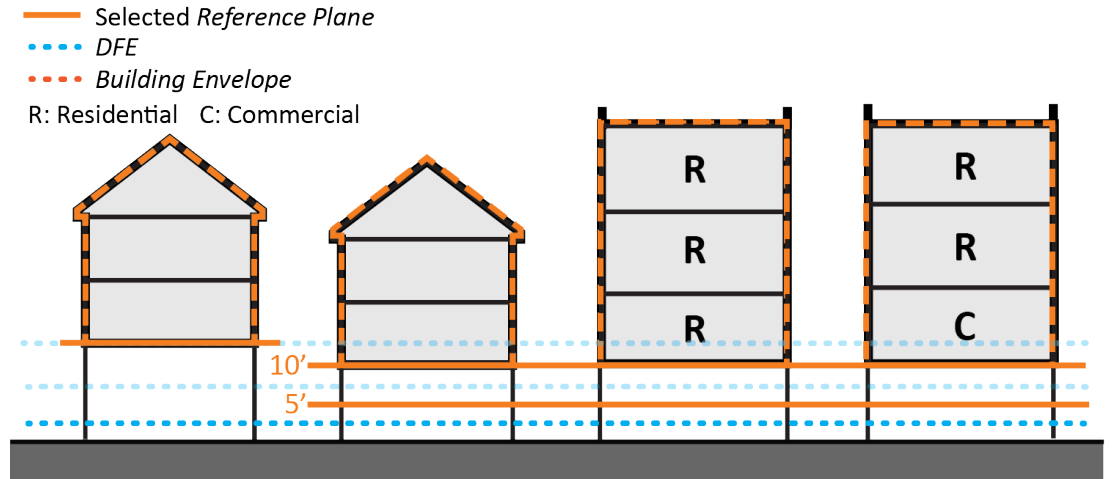
**Building Envelope**

**Height Allowance**

Optional height regulations would facilitate buildings to **incorporate sea level rise projections** when meeting *flood-resistant construction standards*, while improving the utility of spaces below the *DFE*.



**Existing Rules:** DFE or a Reference Plane measured from 9', 10' or 12' depending on the building's use and zoning district



**Proposed Rules:** DFE or a Reference Plane (up to 10' or 5') available to all lots in the 1% and 0.2% floodplains, respectively

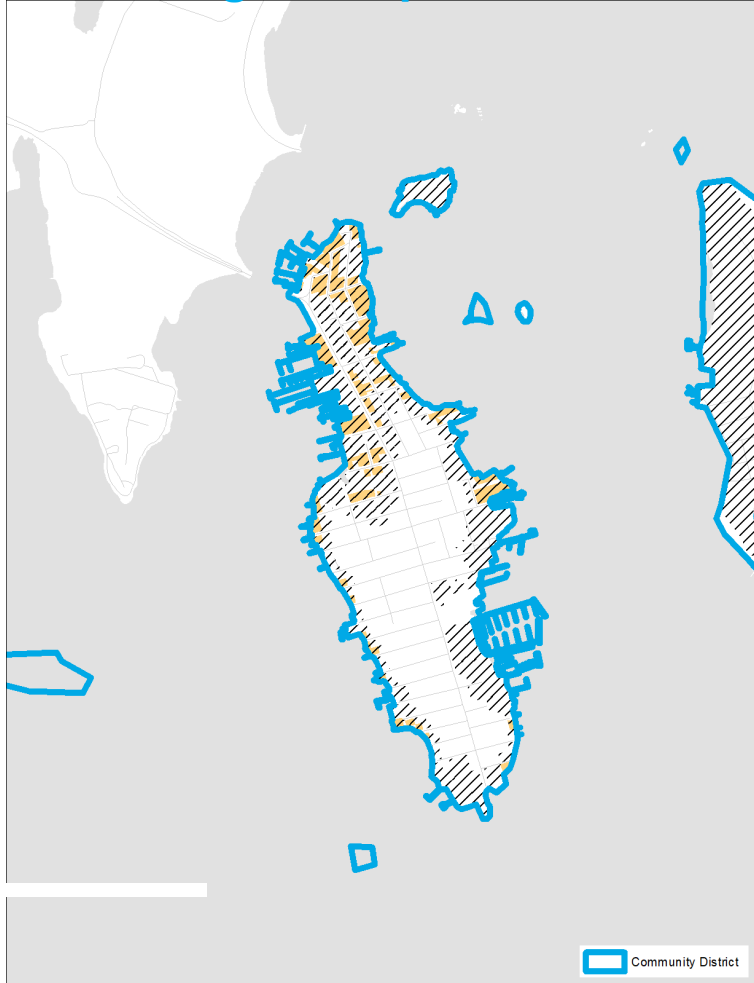
Updated Item<sub>15</sub>

Building Envelope

Height Allowance

# Applicability in City Island

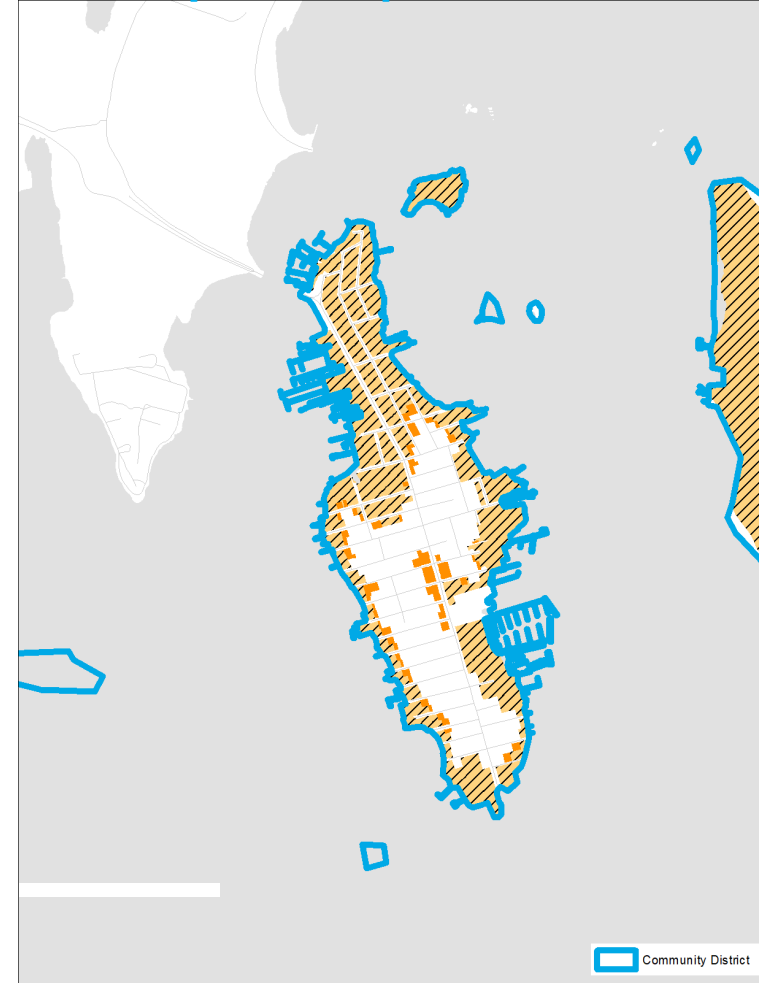
## Existing FT1 Optional Rules



▨ DFE   ▨ DFE or 12', 10', 9' RP  
whichever is higher



## Proposed Optional Rules



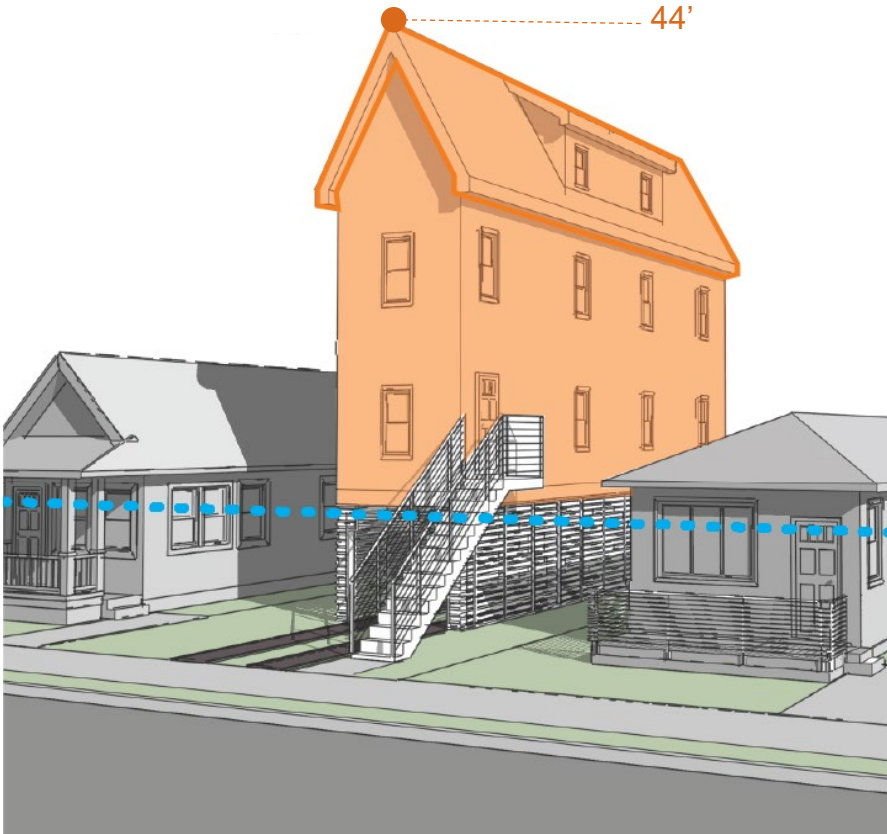
▨ DFE or up to 10' RP   ▨ 5' RP  
whichever is higher



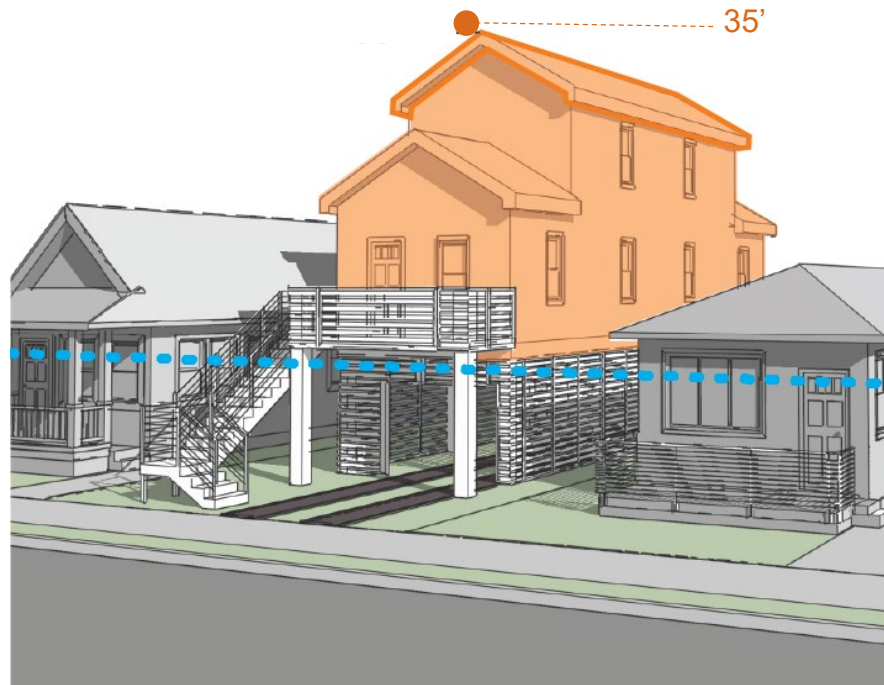
**Building Envelope**

**Cottage Envelope**

Optional *Building Envelope* would facilitate the **construction, reconstruction, and retrofit** of homes located on pre-existing substandard lots **in all areas**, and better reflect the scale of traditional cottage buildings.



**Existing Rules:** maximum height of 35' as measured from the DFE or 9' Reference Plane



**Proposed Rules:** maximum height of 25' as measured from the DFE up to 10' Reference Plane

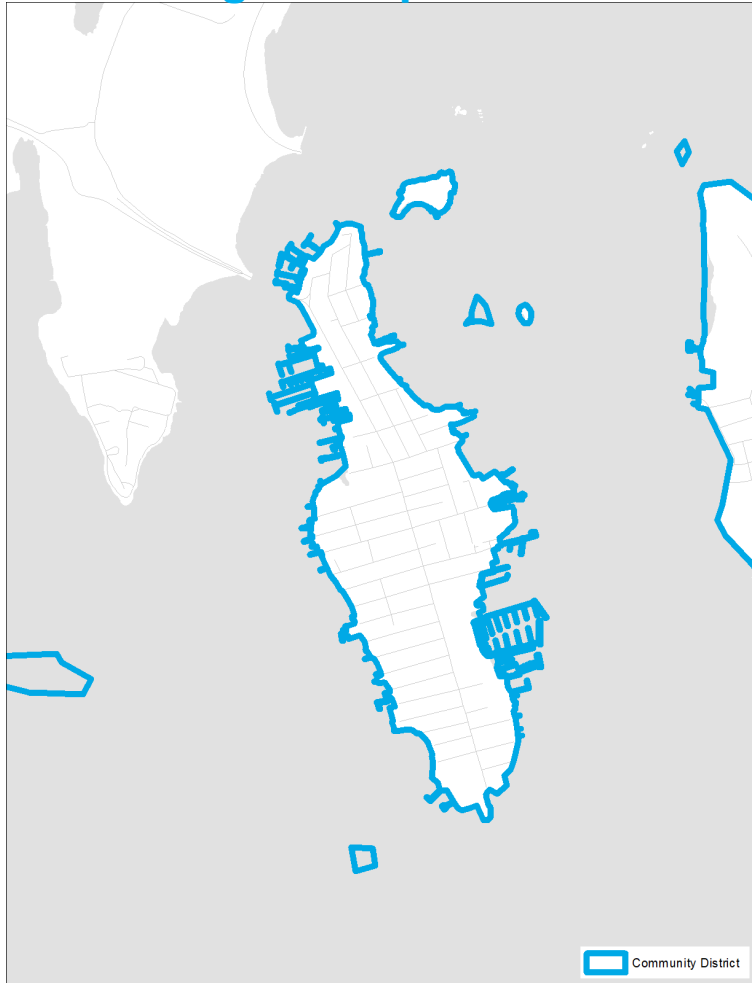
Updated Item<sub>17</sub>

**Building Envelope**

**Cottage Envelope**

# Applicability in **City Island**

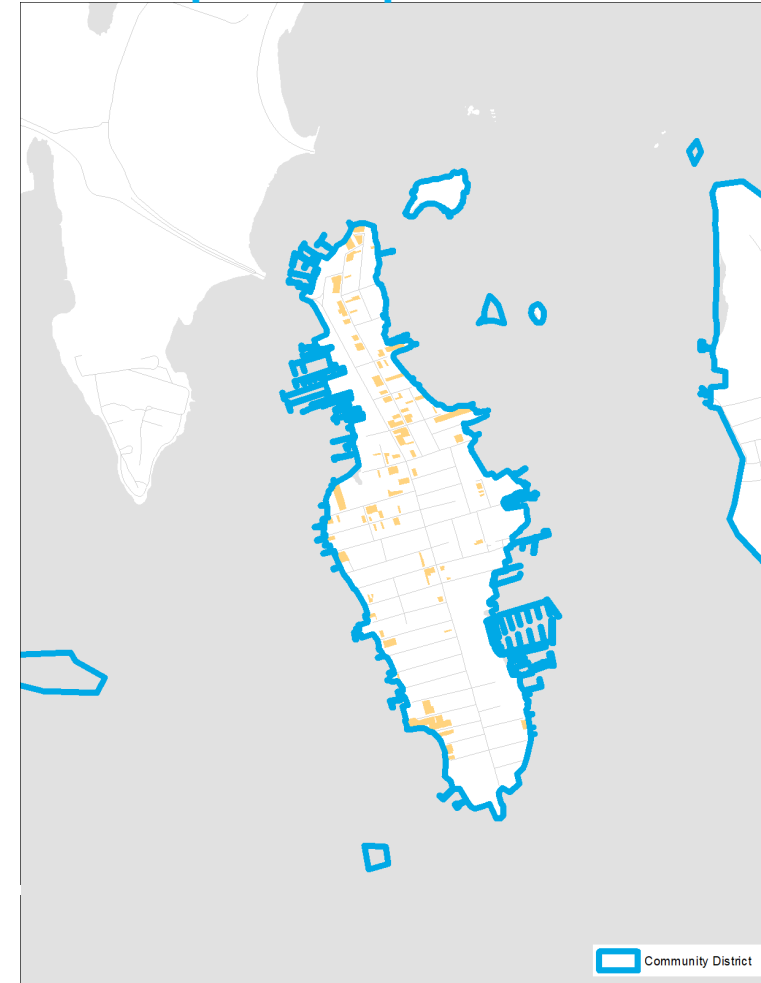
**Existing FT1 Optional Rules**



**/// Cottage Envelope available within SRNR Boundaries in 1% annual chance floodplain**



**Proposed Optional Rules**



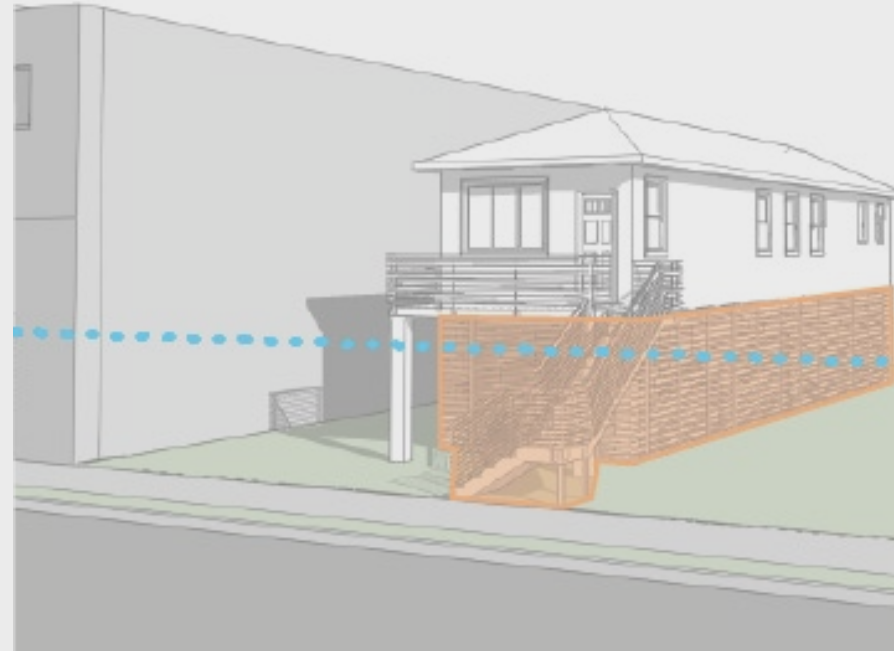
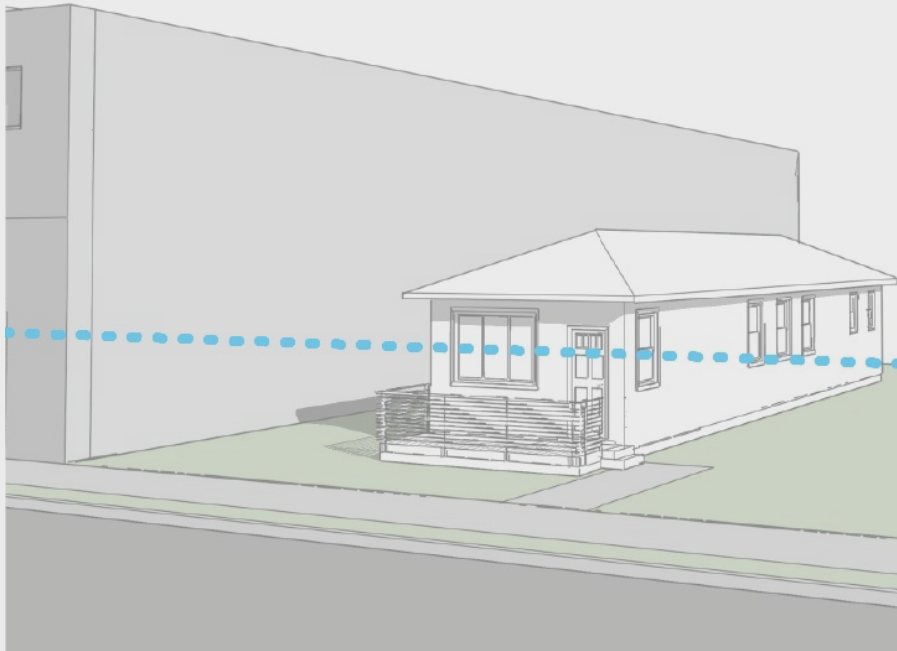
**■ Cottage Envelope available within 1% and 0.2% annual chance floodplains**



**Building Envelope**

**Existing Buildings**

Regulations would allow the reconstruction, enlargement or alteration of a **greater range of** existing non-complying and/or non-conforming buildings to meet **or exceed flood-resistant construction standards**.



**Existing Rules:** homes in M/C8 districts cannot be retrofitted or rebuilt

**Proposed Rules:** homes in M/C8 districts can be retrofitted or rebuilt

## Building Design

## Streetscape Regulations

Streetscape regulations would promote walkability across the city's **floodplain** by ensuring an accessible design that makes the streetscape more inviting while mitigating additional height.



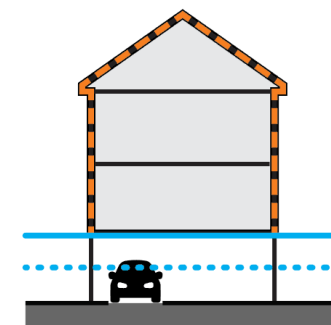
**Existing Rules:** Few design options to help mitigate potential blank walls



**Proposed Rules:** Wider range of design options to make the streetscape more inviting while mitigating additional height

## Parking

Flexible curb-cut rules allow for parking below elevated homes (R1-R5)



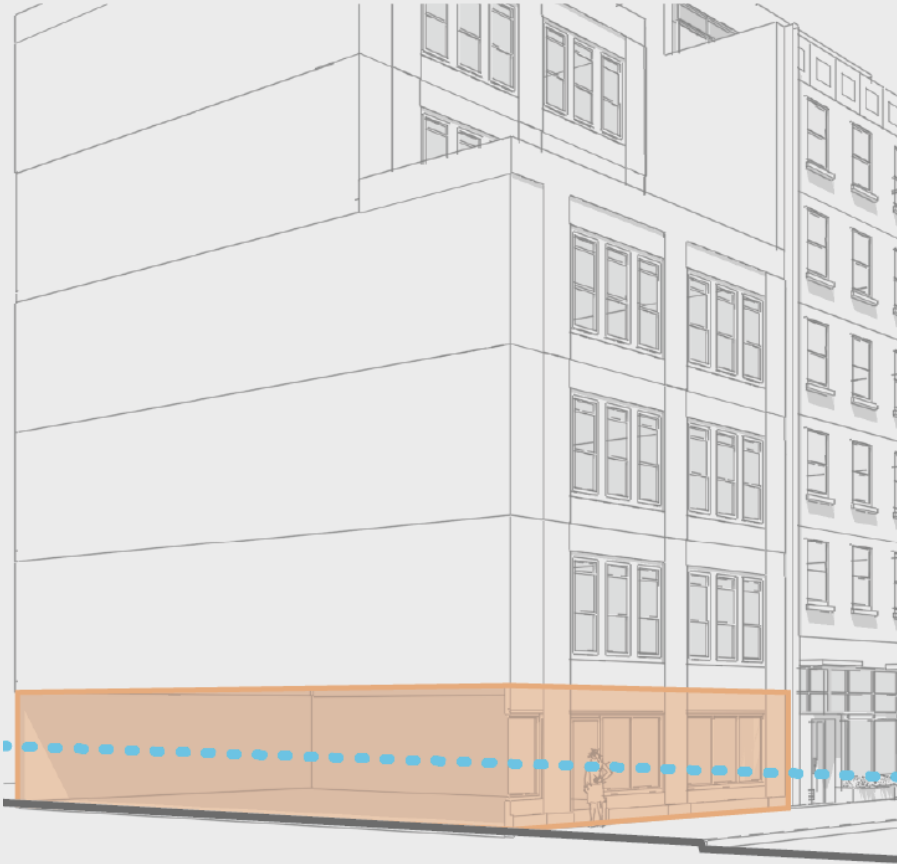
Updated Item<sub>20</sub>



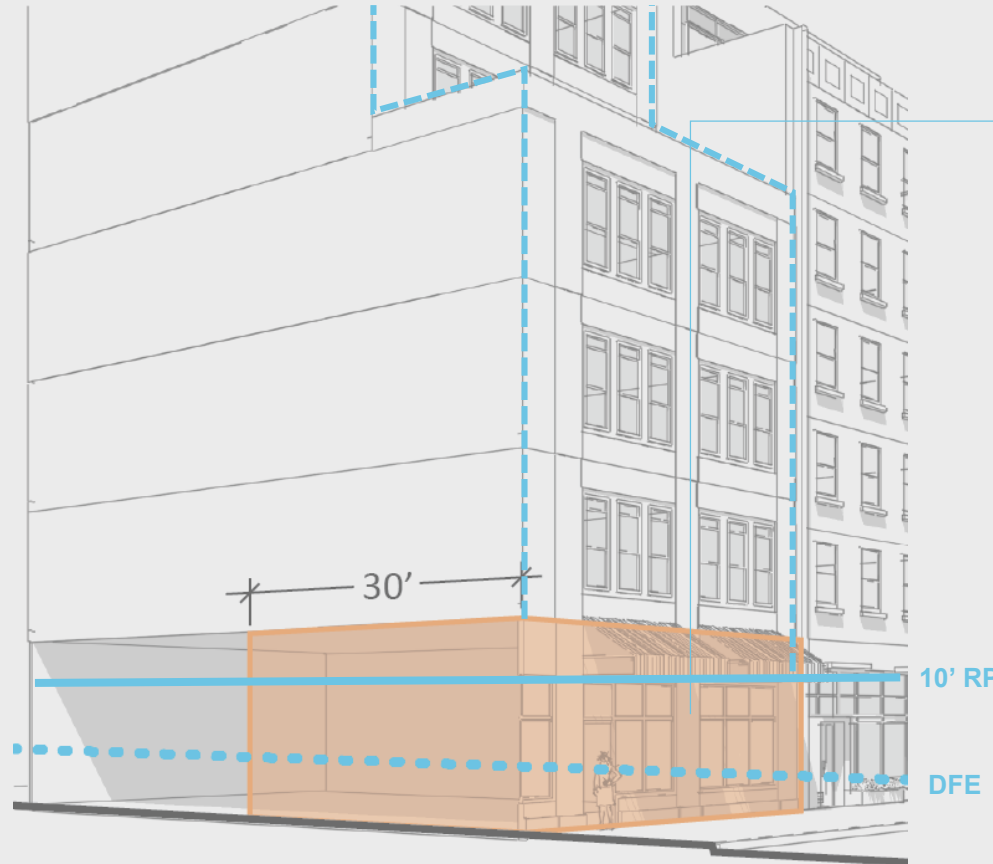
**Building Design**

**Floor Area Exemptions**

Floor Area regulations would exempt floor area to encourage new and existing buildings to meet **or exceed flood-resistant construction standards, while ensuring quality ground-floors that are kept at street level.**



**Existing Rules:** entire ground-floor is exempted if > half of the floor-to-ceiling height is below the DFE



**Design Requirements**  
Require transparency and quality ground-floors

**And for wet-flood proofed ground floors**  
**Or to provide internal access or mechanical equipment**

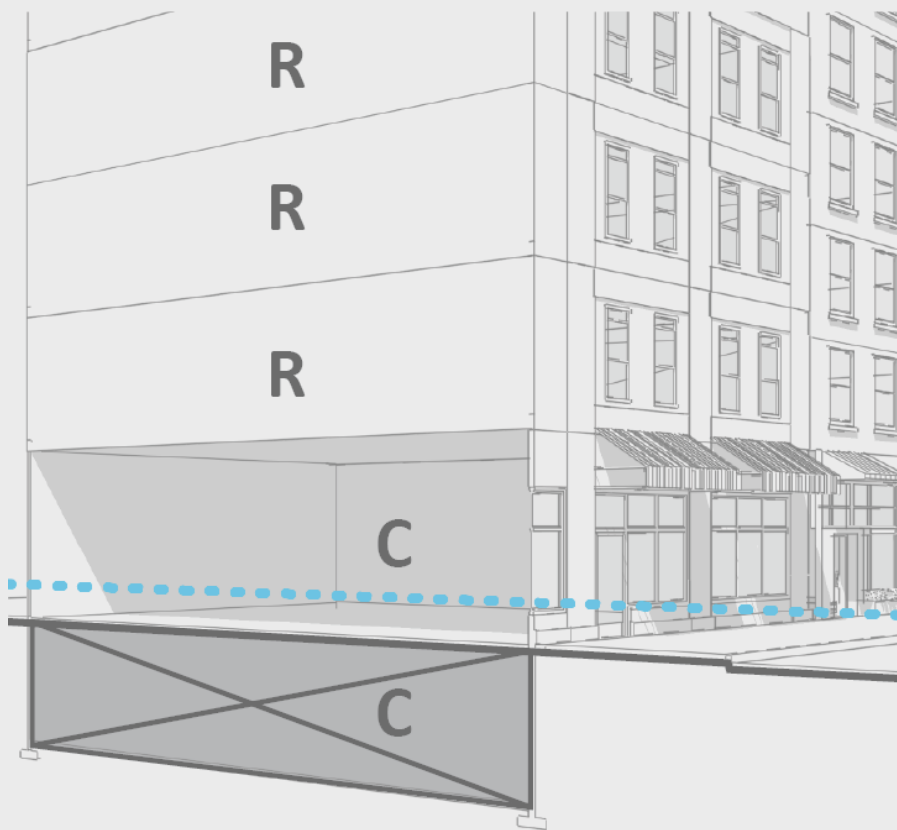
**Proposed Rules:** a portion of the ground-floor is exempted if meeting design requirements

Updated Item<sub>21</sub>

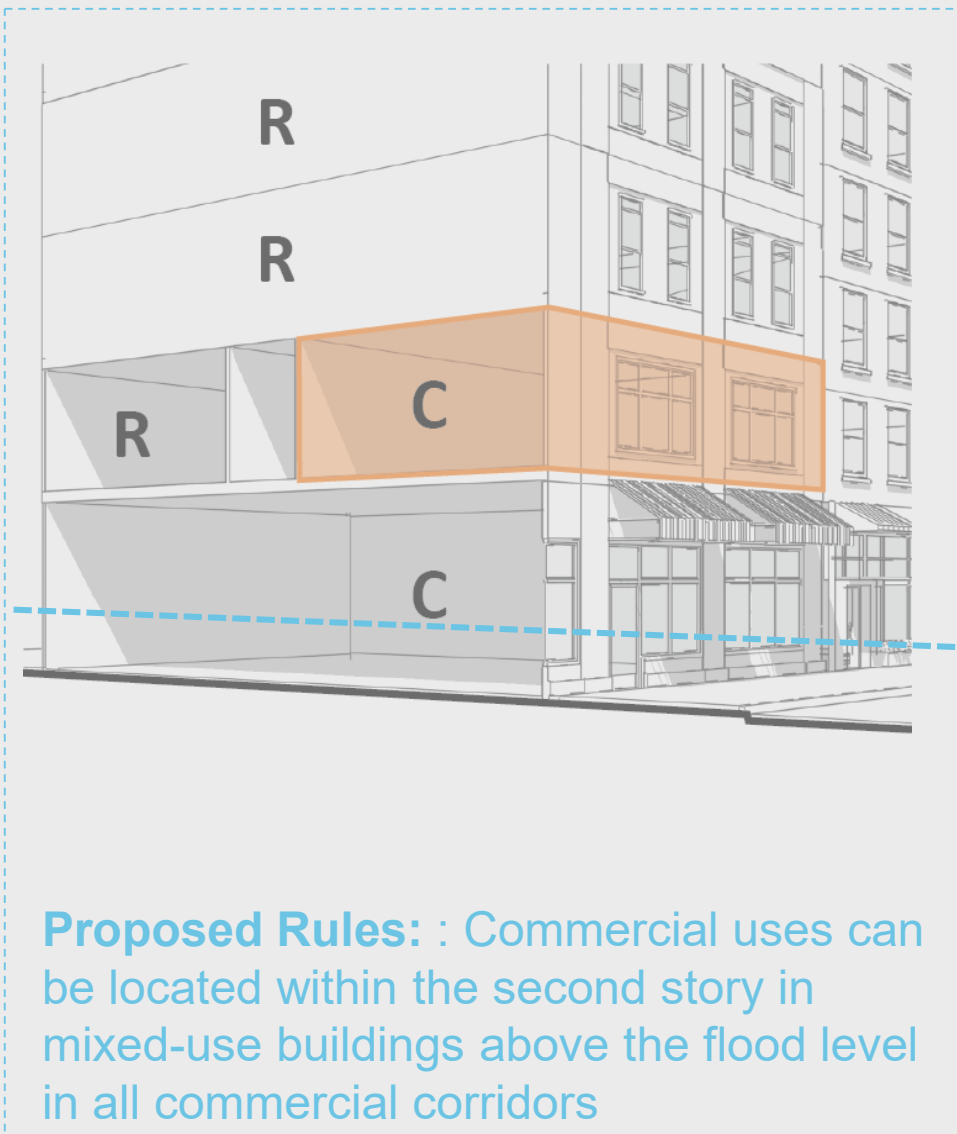
**Building Design**

**Use Regulation**

Supplemental use regulations would offer alternatives beyond dry-floodproofed cellars for businesses to locate commercial uses, especially accessory spaces



**Existing Rules:** Commercial uses are limited to the ground-floor in mixed-use buildings in certain commercial corridors

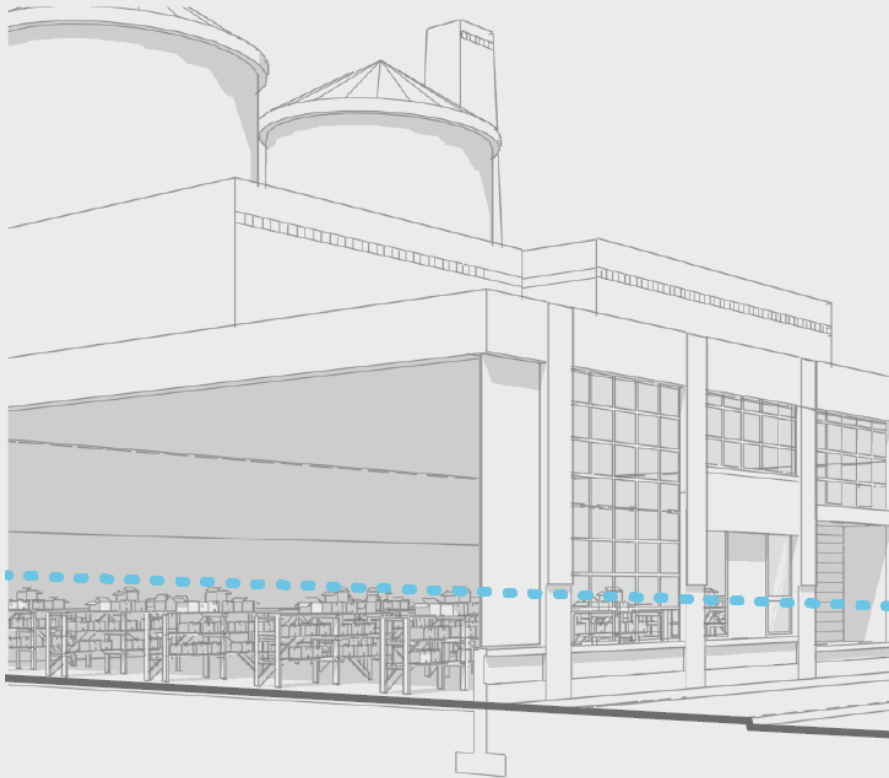


**Proposed Rules:** Commercial uses can be located within the second story in mixed-use buildings above the flood level in all commercial corridors

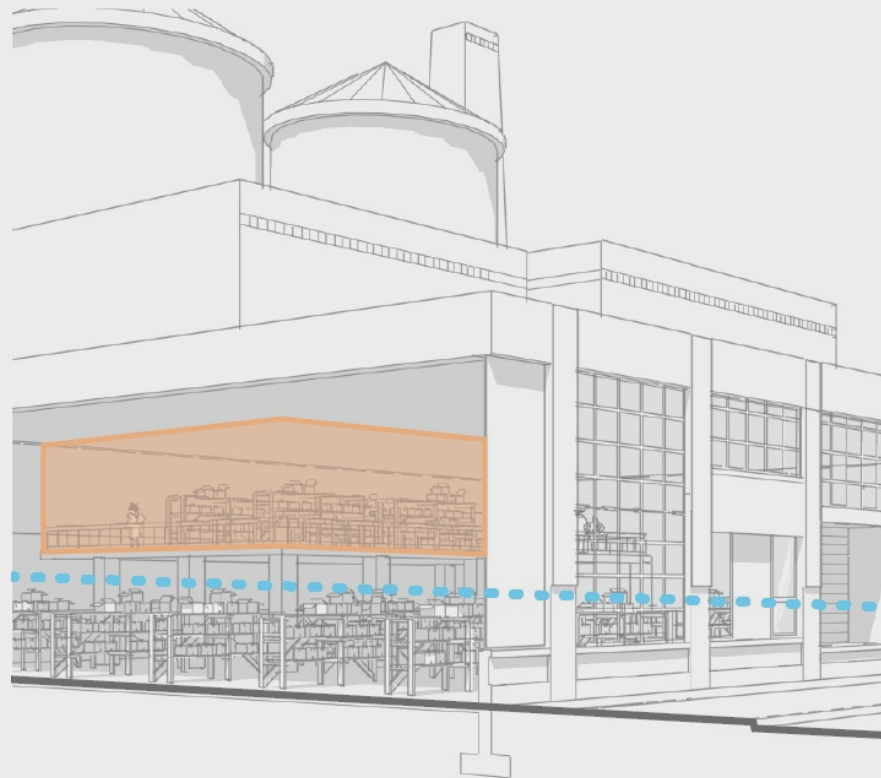
**Partial Resiliency Strategies**

**Floor Area Exemption**

Industrial buildings can create small mezzanine or 2<sup>nd</sup> floor to store important space/equipment



**Existing Rules:** Existing industrial buildings may not have enough floor area to elevate important equipment/spaces



**Proposed Rules:** Floor area can be exempted to facilitate the placement of important equipment/spaces above the flood level within small mezzanines



**Partial Resiliency Strategies**

**Mechanical Equipment**

Permitted obstruction and floor area regulations would facilitate the placement of **MEP equipment** above the **DFE**, including emergency generators within or outside of buildings, including within separate **MEP buildings**.

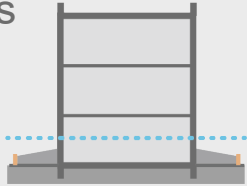


**Existing Rules:** Additional flexibility with permitted obstructions facilitate mechanical equipment to be relocated to the roof of buildings

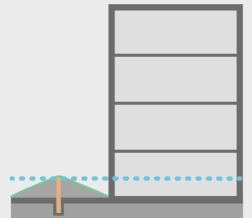


**Proposed Rules:** Additional flexibility to facilitate mechanical, electrical and plumbing equipment to be placed on the roof or in a separate structure

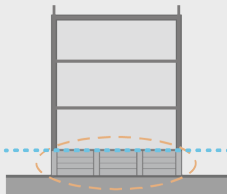
Or to build retaining walls and raise yards



Or to build berms



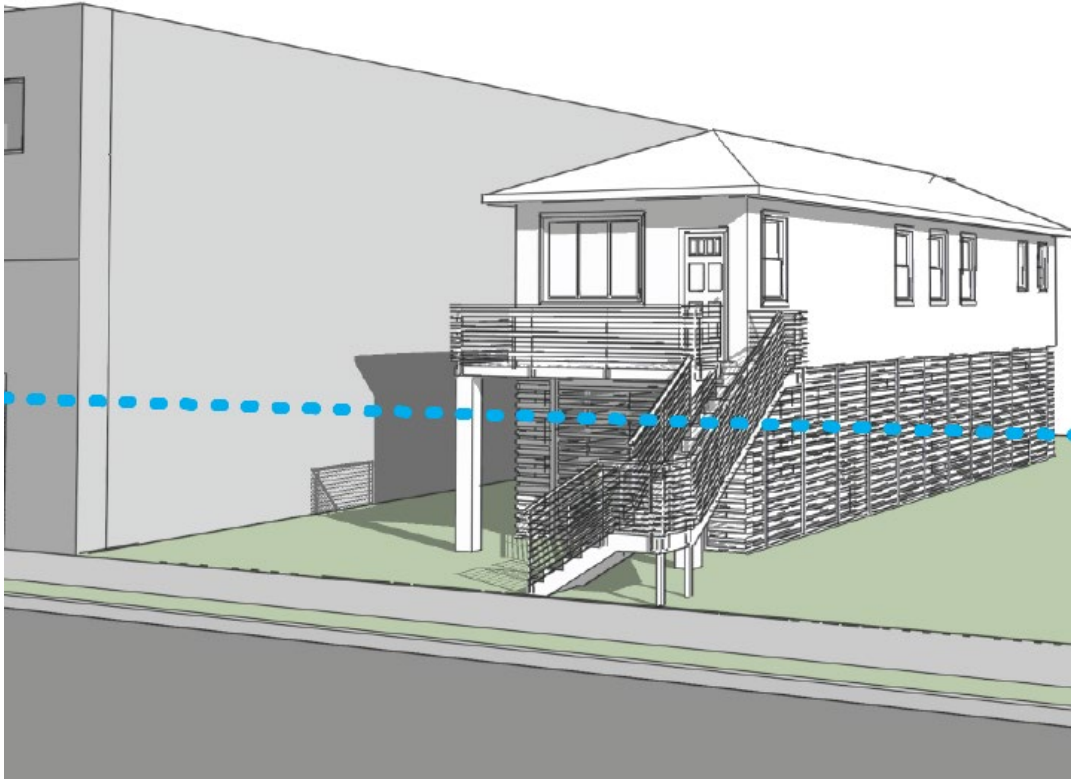
Or deploy flood panels



Updated Item<sub>24</sub>

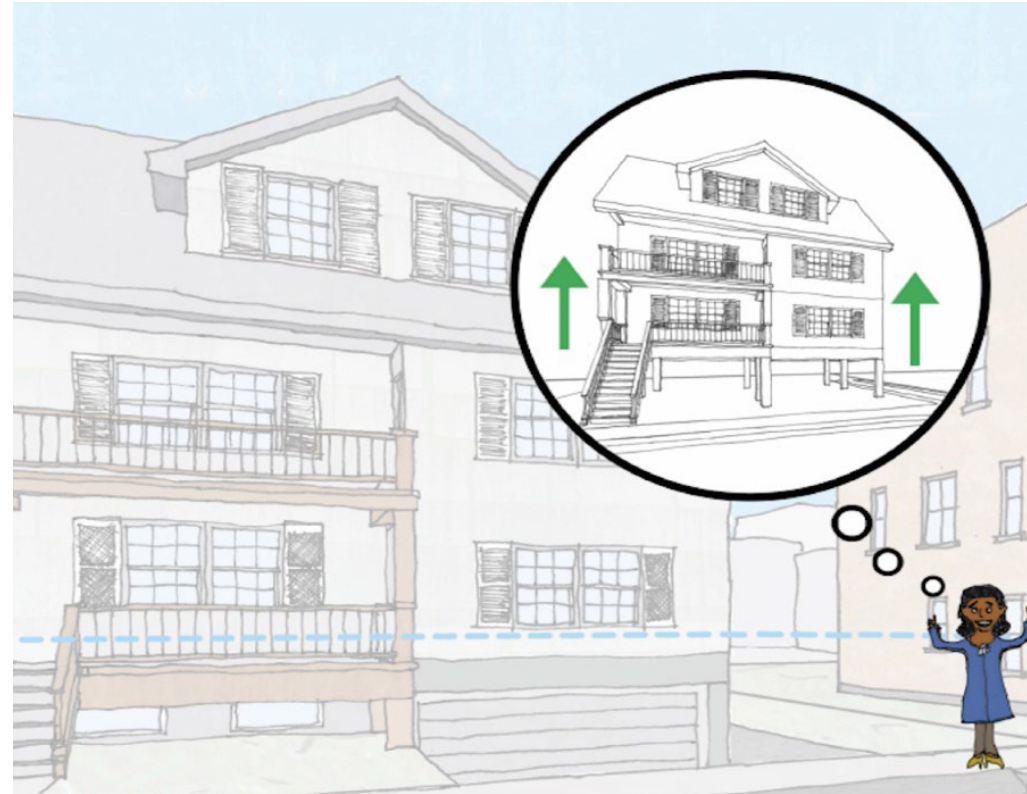
## Emergency Rules

Regulations would facilitate the reconstruction of existing non-complying and/or non-conforming buildings that were **damaged by a future disaster in future recovery area.**



### Reconstruction allowances

Substantially-damaged non-conforming or non-complying buildings can rebuild to at least minimum resiliency standards



### Documentation process

Aerial photographs and tax bills can be used to establish the existence of a building// Survey prepared by a land surveyor may be used to document non-compliances

# Zoning for Coastal Flood Resiliency Update

## Project Timeline





# Resources

Flood Insurance information:  
<https://www.floodhelpny.org/>

NYC Flood Hazard Mapper:  
[www.nyc.gov/floodhazardmapper](http://www.nyc.gov/floodhazardmapper)

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

[www.nyc.gov/resilientneighborhoods](http://www.nyc.gov/resilientneighborhoods)

Community District Profiles:

<https://communityprofiles.planning.nyc.gov>

**NYC PLANNING** Info Brief  
**Flood Insurance**

Flood insurance covers damages to property or personal contents from flooding caused by excessive rainfall, tidal flooding, or wind-driven storm surges. Changes to flood maps and reforms to the National Flood Insurance Program will lead to increases in flood insurance rates over time. In addition to flood resilient construction, insurance is another strategy for reducing flood risk.

**NYC PLANNING** Info Brief  
**Flood Risk in NYC**

New York City is highly vulnerable to flooding from coastal storms due to its intensively used waterfront and its extensive coastal geography. Floods have the potential to destroy homes and businesses, impair infrastructure, and threaten human safety. With climate change and sea level rise, these risks are expected to increase in the future, but will most adversely affect low-lying neighborhoods.

**NYC PLANNING** Info Brief  
**Flood Resilience Zoning**  
[www.nyc.gov/resilientneighborhoods](http://www.nyc.gov/resilientneighborhoods)

City Planning is working with communities throughout the floodplain to identify zoning and land use strategies to reduce flood risks and support the city's vitality and resiliency through long-term adaptive planning. The Flood Resilience Zoning Text is one part of a wide range of efforts by the City to recover from Hurricane Sandy, promote rebuilding, and increase the city's resilience to climate-related events.

**NYC PLANNING** Info Brief  
**Flood Resilient Construction**

Flood resilient construction reduces potential damages from flooding and can lower flood insurance premiums. New buildings in the floodplain are required to meet flood resilient standards. Existing buildings can reduce their risk by retrofitting or rebuilding to meet these standards, or can take partial, short-term measures to address safety concerns.

**Overview**  
The Flood Text enables and encourages resilient building construction through designated floodplains.

The Flood Text modified zoning to regulate barriers that hindered or prevented the reconstruction of storm-damaged by enabling new and existing building with new, higher flood elevations issued by the Federal Emergency Management Agency (FEMA), and to comply with new requirements of the New York City Building Code.

It also introduced regulations to mitigate negative effects of flood resilient construction on the public realm. The text was adopted on a temporary, emergency basis. The future update of this text, guided by community input, will aim to make the text permanent and incorporate lessons learned during its implementation process.

**Where is the Flood Text Applicable?**  
The Flood Text is available to build located entirely or partially within annual chance floodplain\*.

These rules can be found in Article V of the Zoning Resolution and, if utilized, require the building to fully comply with resilient construction standards found in the New York City Building Code. Some provisions, such as elevation certification spaces, are available to all buildings in the floodplain, even if not fully compliant with Appendix G.

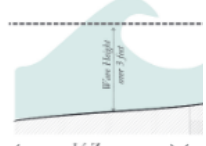
For more information about the Flood Resilient Construction standards, visit [www.nyc.gov/resilientneighborhoods](http://www.nyc.gov/resilientneighborhoods).

\*Per the more restrictive of the 2007 FIRMs or the 2015 PFIRMs.

NYC Planning | November 2016

**NYC PLANNING** Info Brief  
**Flood Resilient Construction**

The 1% annual chance floodplain is divided into different degrees of flood risk: V and Coastal Flood Risk. The map shows the areas of the city which have a lower annual chance of flooding.



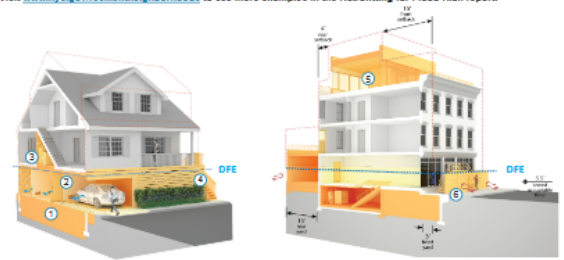
NYC Planning | March 2017 | Flood Resilient Construction

**NYC PLANNING** Info Brief  
**Flood Resilient Construction**

**Overview**  
There is a wide range of accepted flood resilient construction practices for buildings to better withstand floods and reoccupy more quickly following a storm. These include:

- Elevating the lowest floor.
- Elevating mechanical equipment such as electrical, heating, and plumbing equipment.
- Wet floodproofing by utilizing water resistant building materials and limiting uses below the Design Flood Elevation (DFE) to parking, building access, and minor storage. This allows water to move in and out of uninhabited, lower portions of the building with minimal damage.
- Dry floodproofing sealing the building's exterior to flood waters and using removable barriers at all entrances below the expected level of flooding in mixed-use and non-residential buildings.

**Examples of Flood Resilient Construction**  
Visit [www.nyc.gov/resilientneighborhoods](http://www.nyc.gov/resilientneighborhoods) to see more examples in the Retrofitting for Flood Risk report.



**Wet floodproofed residential building**

- 1 Site is filled to the lowest adjacent grade
- 2 Space below the DFE is for parking, building access or minor storage
- 3 Mechanical systems are above the DFE
- 4 Plants and stair turns improve the look of the building from the street

**Dry floodproofed mixed-use building**

- 5 Rooftop addition replaces lost below grade space
- 6 Commercial space is dry floodproofed with removable barriers

NYC Planning | November 2016 | Flood Resilient Construction