

# Flood Resilience Zoning Text Update

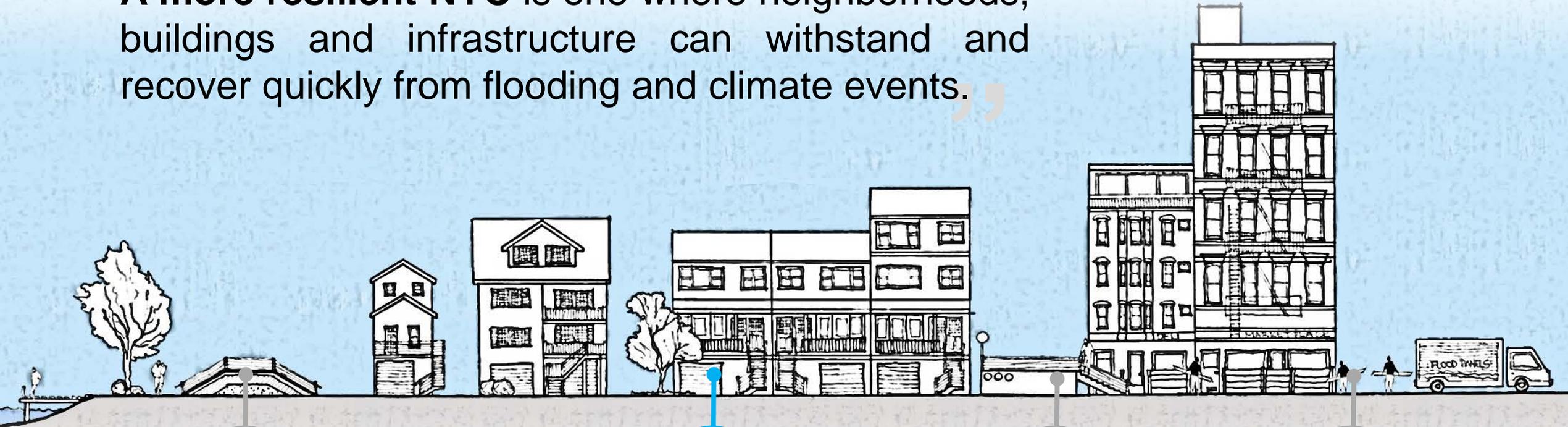
Brooklyn CB 13

December 20, 2017



# #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

*Army Corps of Engineers, NYS DEC, NYC DPR*



## Buildings

are designed to withstand and recover from flooding

*FEMA, DCP, DOB, HRO, NYCHA*



## Infrastructure is

protected from climate hazards  
*DOT, DEP, DDC, Utility Companies, MTA*

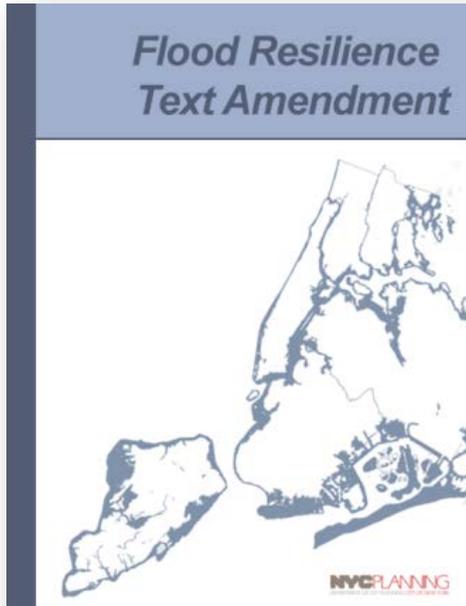


## Residents and businesses

are prepared

*OEM*

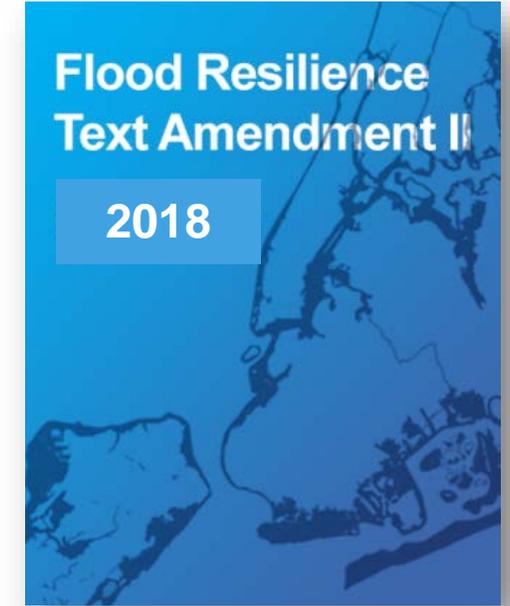
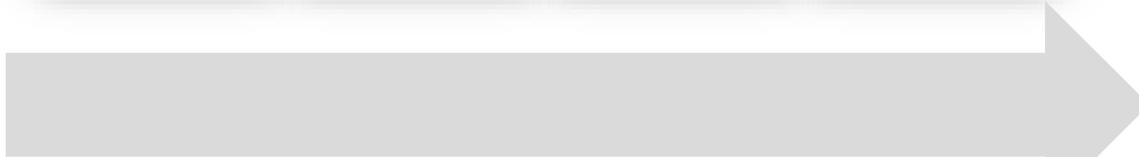
# Flood Resilience Zoning Projects at DCP



**2013**

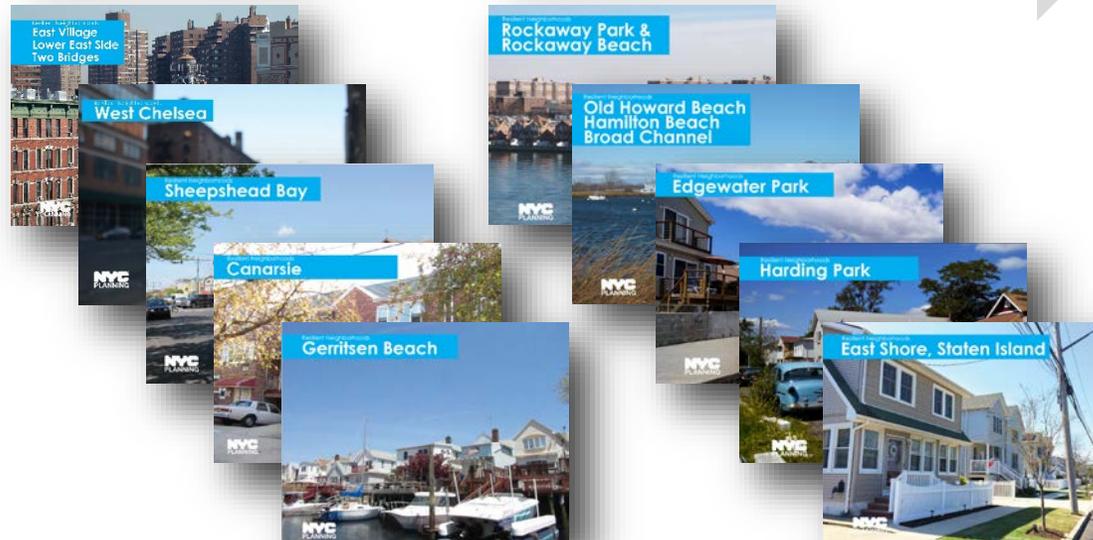
**“Flood Text”**

initial temporary regulations to facilitate recovery



**2018**

**“Flood Text Update”**  
improve upon, and make permanent, the Flood Text



# Zoning for Flood Resilience

## Overview of DCP's Timeline

DCP plans a robust public engagement process:



As part of this outreach process, DCP has been:

- **Partnering 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

# How are buildings in the floodplain regulated?

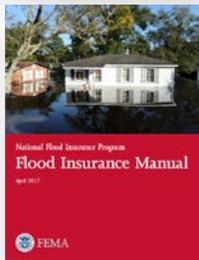


FEMA



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)

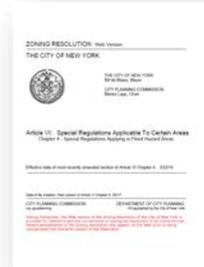
Design minimum construction requirements for flood hazard areas

NYC



Building Code (DOB)

Requires new buildings and substantial improvements to meet FEMA standards



Zoning Resolution (DCP)

Zoning accommodates these regulations and improves neighborhood character

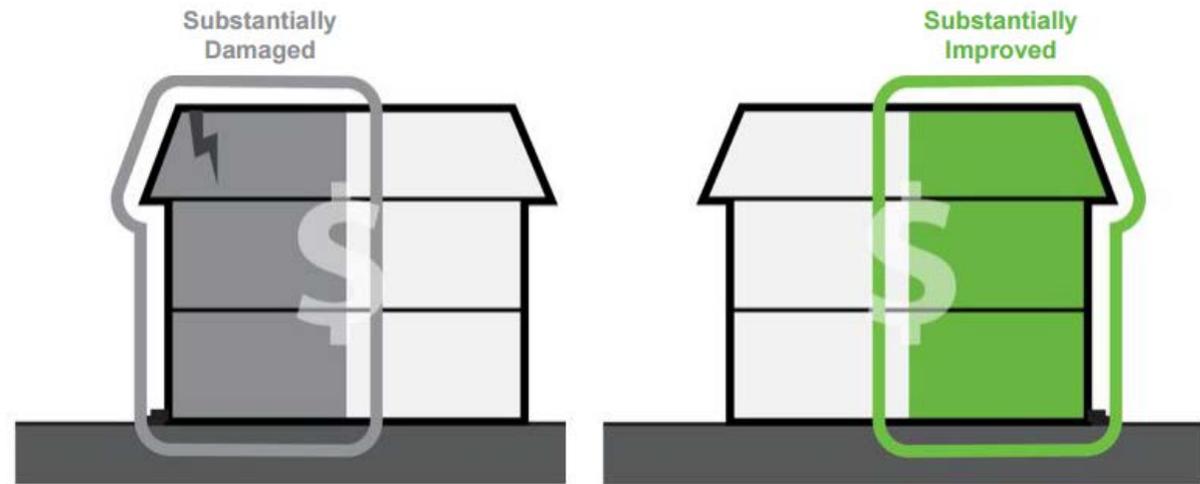
# Flood resilient construction

Required by DOB

**Required**  
for all new buildings



**Not required** for existing buildings  
(unless substantially damaged or improved)



**Substantially Damaged: Restoring Cost  $\geq$  50% Market Value**

**Substantially Improved: Improvement Cost  $\geq$  50% Market Value**

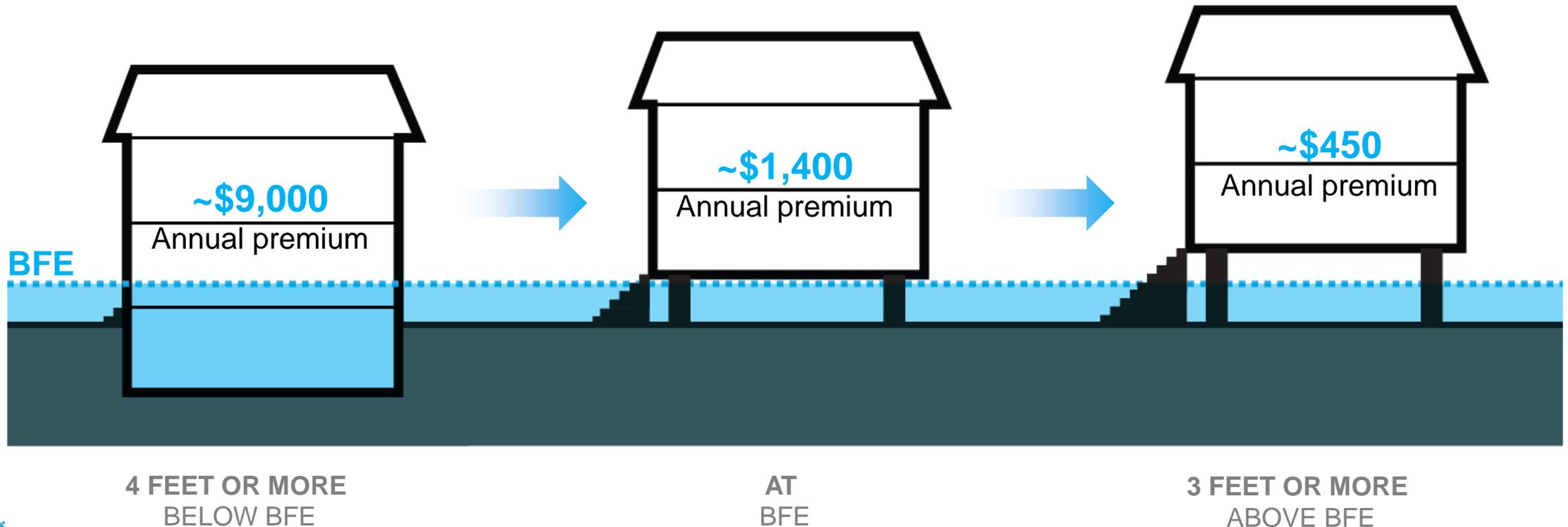
# Flood insurance rates

## Set by FEMA



Raising or retrofitting your building or 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)**.



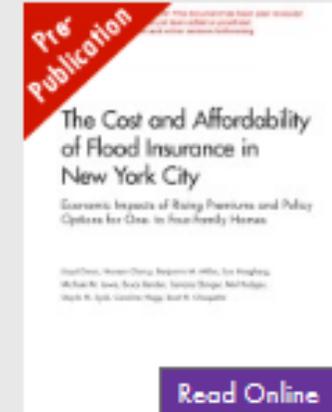
# City Flood Insurance Affordability Study

## The Cost and Affordability of Flood Insurance in New York City

### Economic Impacts of Rising Premiums and Policy Options for One- to Four-Family Homes

by Lloyd Dixon, Noreen Clancy, Benjamin M. Miller, Sue Hoegberg, Michael M. Lewis, Bruce Bender, Samara Ebinger, Mel Hodges, [Gayle M. Syck](#), Caroline Nagy, Scott R. Choquette

Related Topics: [Community Resilience](#), [Flooding](#), [Insurance](#), [New York City](#), [Residential Housing](#)



## Key Findings/Next Steps

- Many neighborhoods including Canarsie will be especially hard hit when risk increases and rates move toward actuarial rates. Rates could reach up to \$4000 a year.
- City is advocating that FEMA explore more cost-effective retrofitting strategies.

# FEMA Flood Map

## Citywide Flood Risk

NYC's flood risk is high.

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

### 100 Year Floodplain

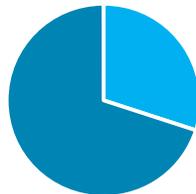
FEMA 2015 PFIRM

Population: **400,000**  
Buildings: **71,500**

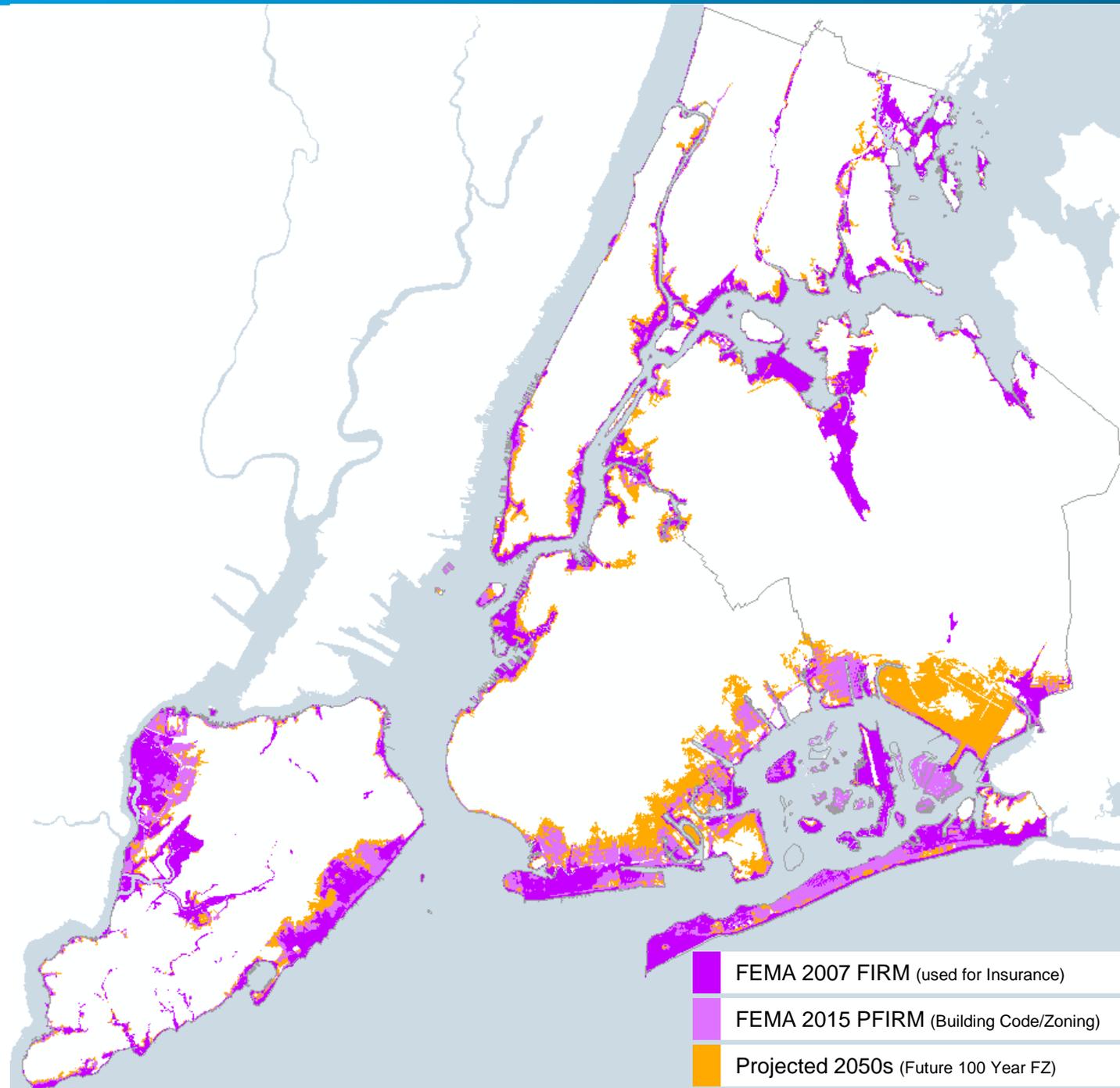
**50** of 59 Community Boards  
**45** of 51 Council Districts



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



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



FEMA 2007 FIRM (used for Insurance)

FEMA 2015 PFIRM (Building Code/Zoning)

Projected 2050s (Future 100 Year FZ)

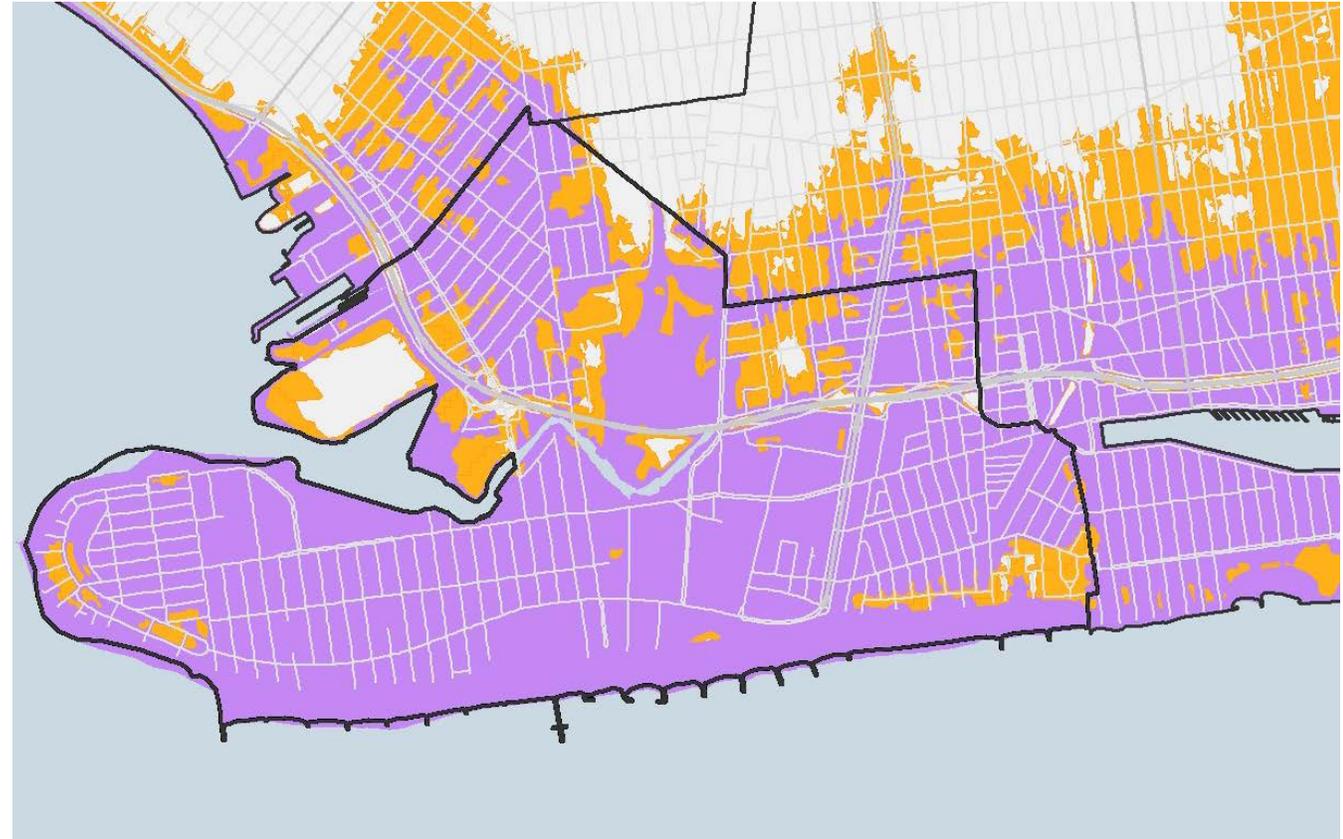
# Future Flood Map

## Flood Risk in CD 13

	2015 PFIRMS	2050's Projected
R units in floodplain	42,600	45,850
Buildings in floodplain	7,330	7,760

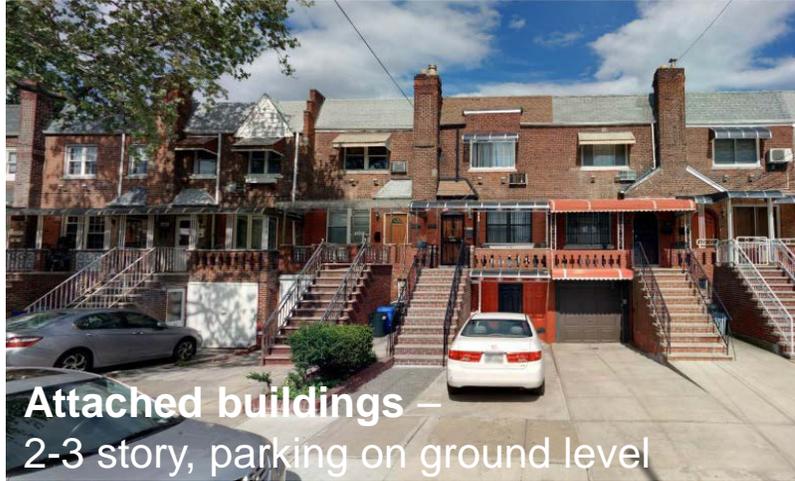
↑  
**8%**

↑  
**6%**



# South Brooklyn

## Building Typologies in the Floodplain



Attached buildings –  
2-3 story, parking on ground level



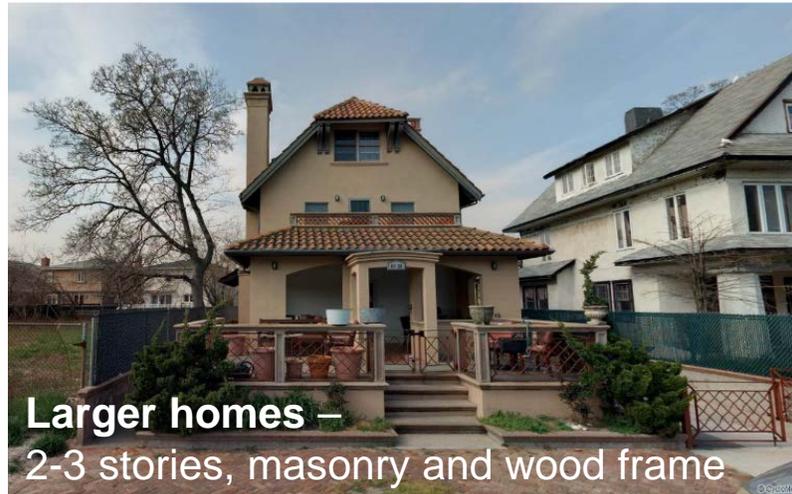
Large-scale apartment buildings –  
6+ stories



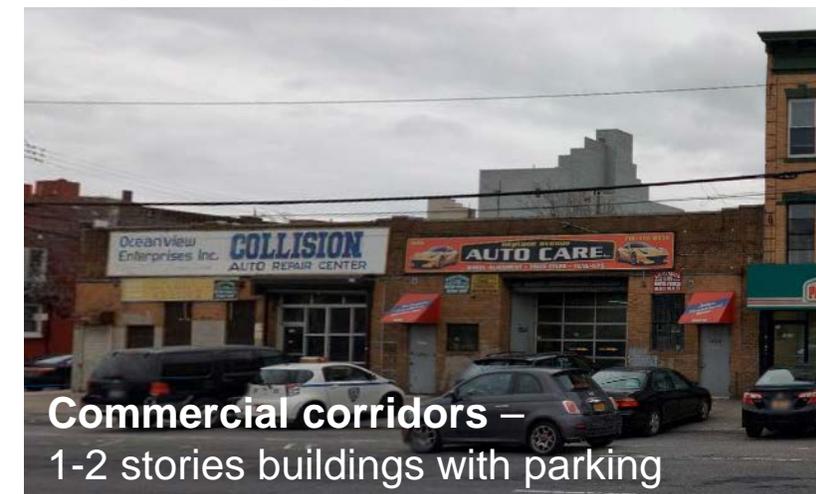
Mixed-use apartment buildings –  
2-6 stories, ground floor retail



Small bungalows –  
1-2 stories, detached, wood frame



Larger homes –  
2-3 stories, masonry and wood frame



Commercial corridors –  
1-2 stories buildings with parking

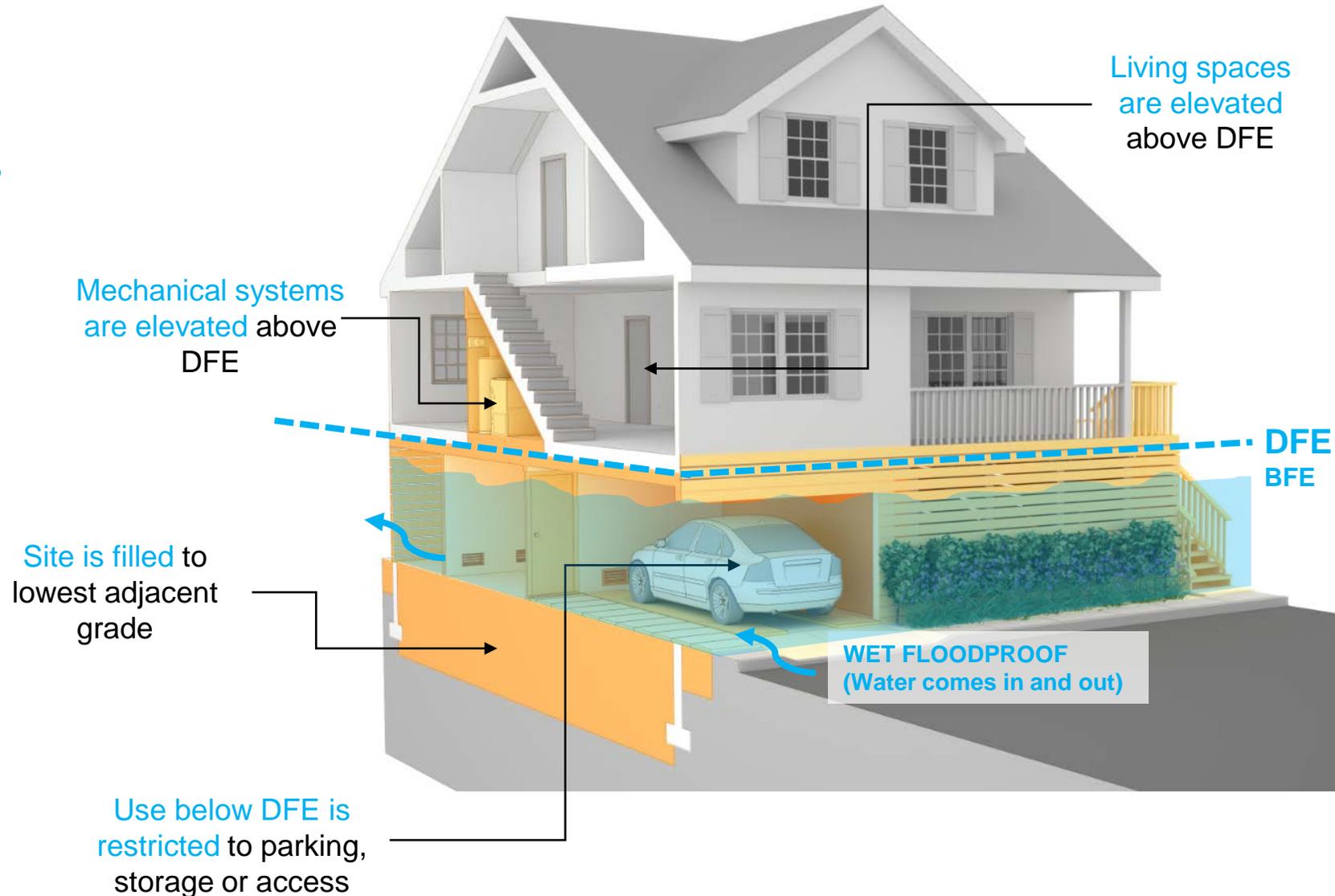
# Flood resilient construction Required by DOB

Building Code  
(DOB)

**Flood resilient construction** standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).

**Base Flood Elevation (BFE)** is the expected height of flooding from the 1% annual chance flood

**Design Flood Elevation (DFE)** is the BFE + *freeboard* of 1-2 feet for additional margin of safety



# Flood resilient construction

## Examples of Residential Buildings

Building Code  
(DOB)



Residential Building  
Elevated to DFE



Residential Building Under Construction  
Elevated to DFE

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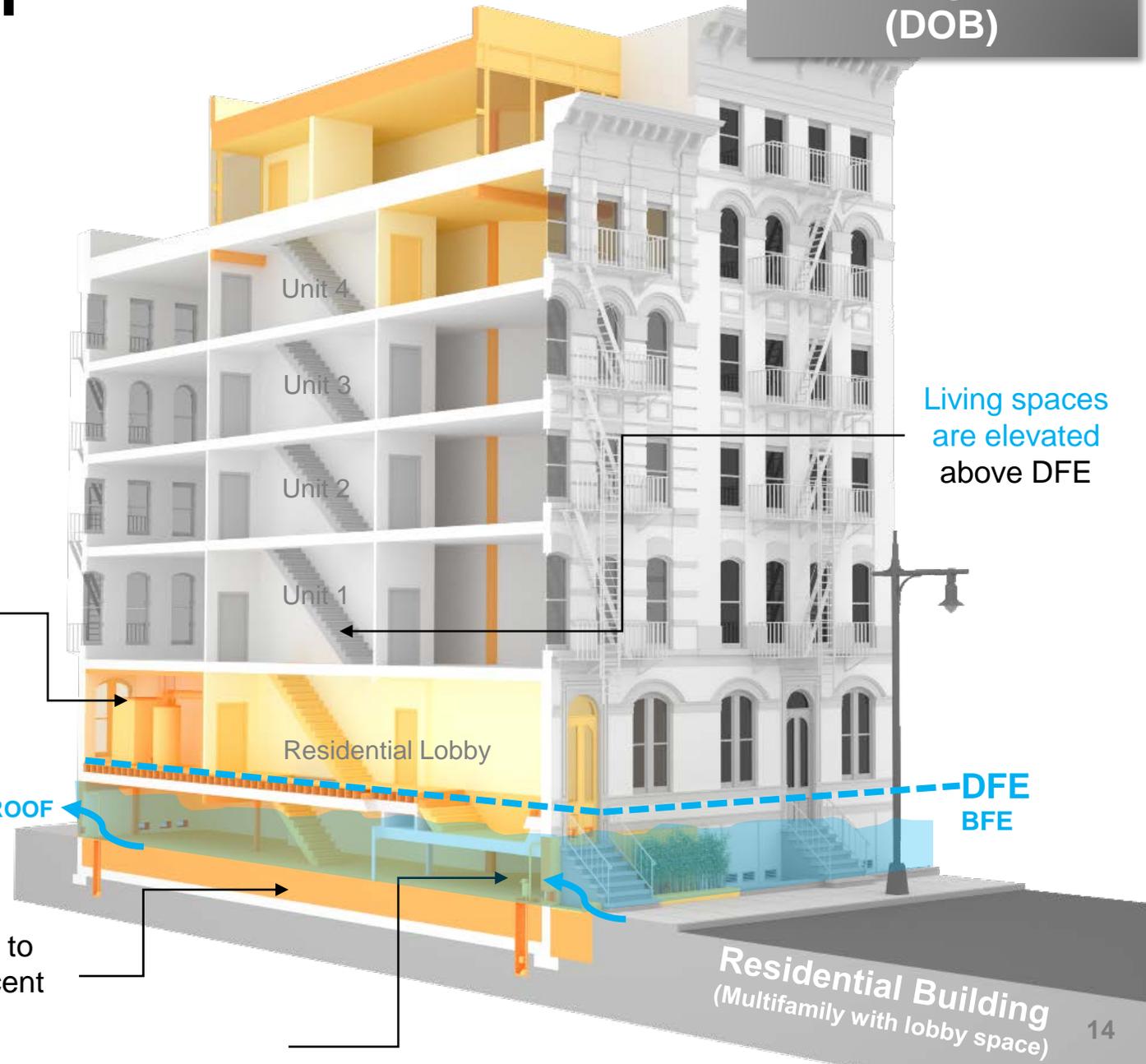
Mechanical systems are elevated above DFE

WET-FLOODPROOF

Site is filled to lowest adjacent grade

Building Code  
(DOB)

Living spaces are elevated above DFE



DFE  
BFE

Residential Building  
(Multifamily with lobby space)

# Flood resilient construction

## Examples of Residential Buildings

Building Code  
(DOB)



Residential units are elevated above the DFE

Wheelchair lift in front yard

**Residential Building**  
Elevated to DFE ~ 5 feet above grade

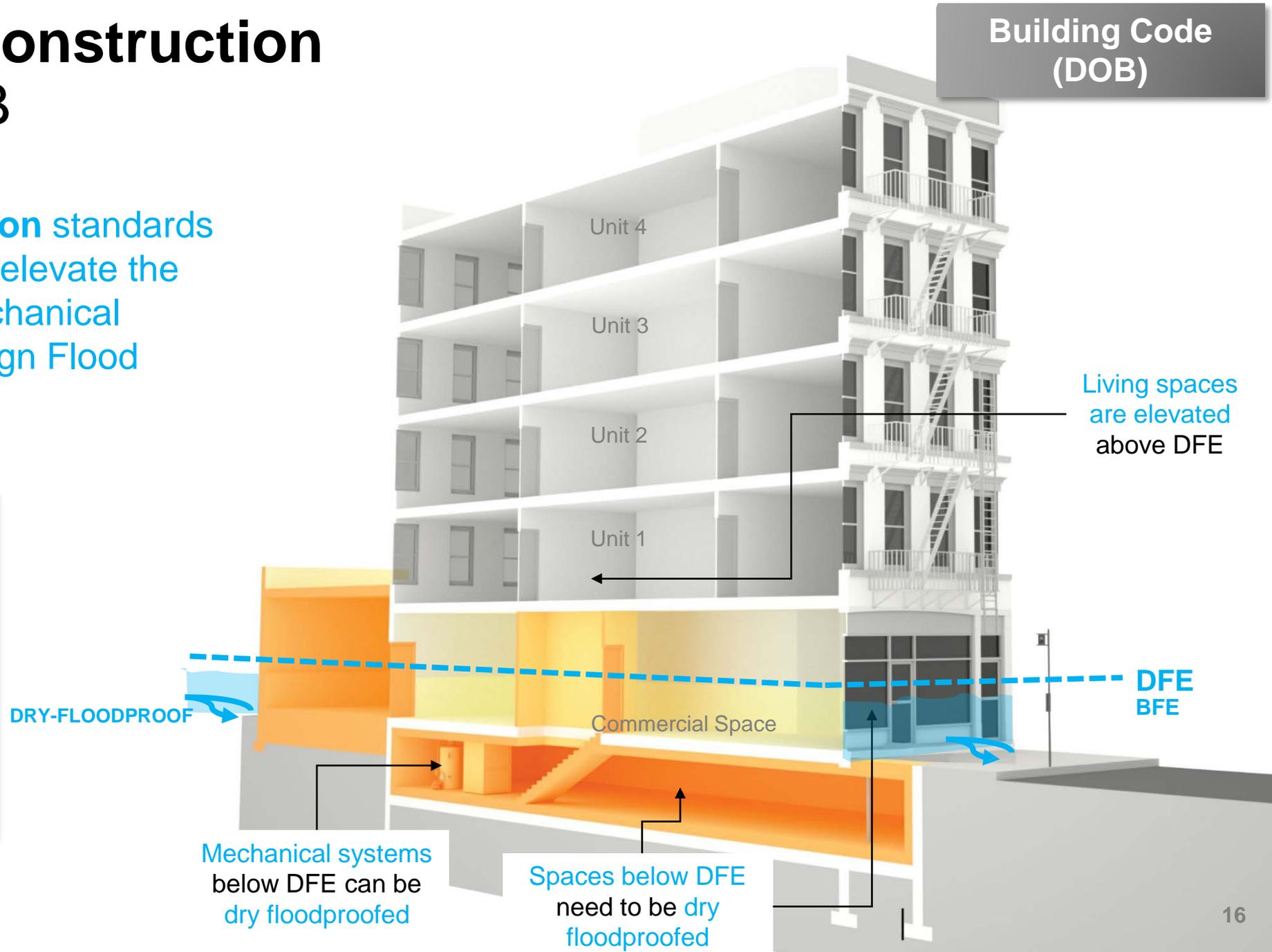
Ground floor used for parking and access

# Flood resilient construction Required by DOB

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# Flood resilient construction Required by DOB

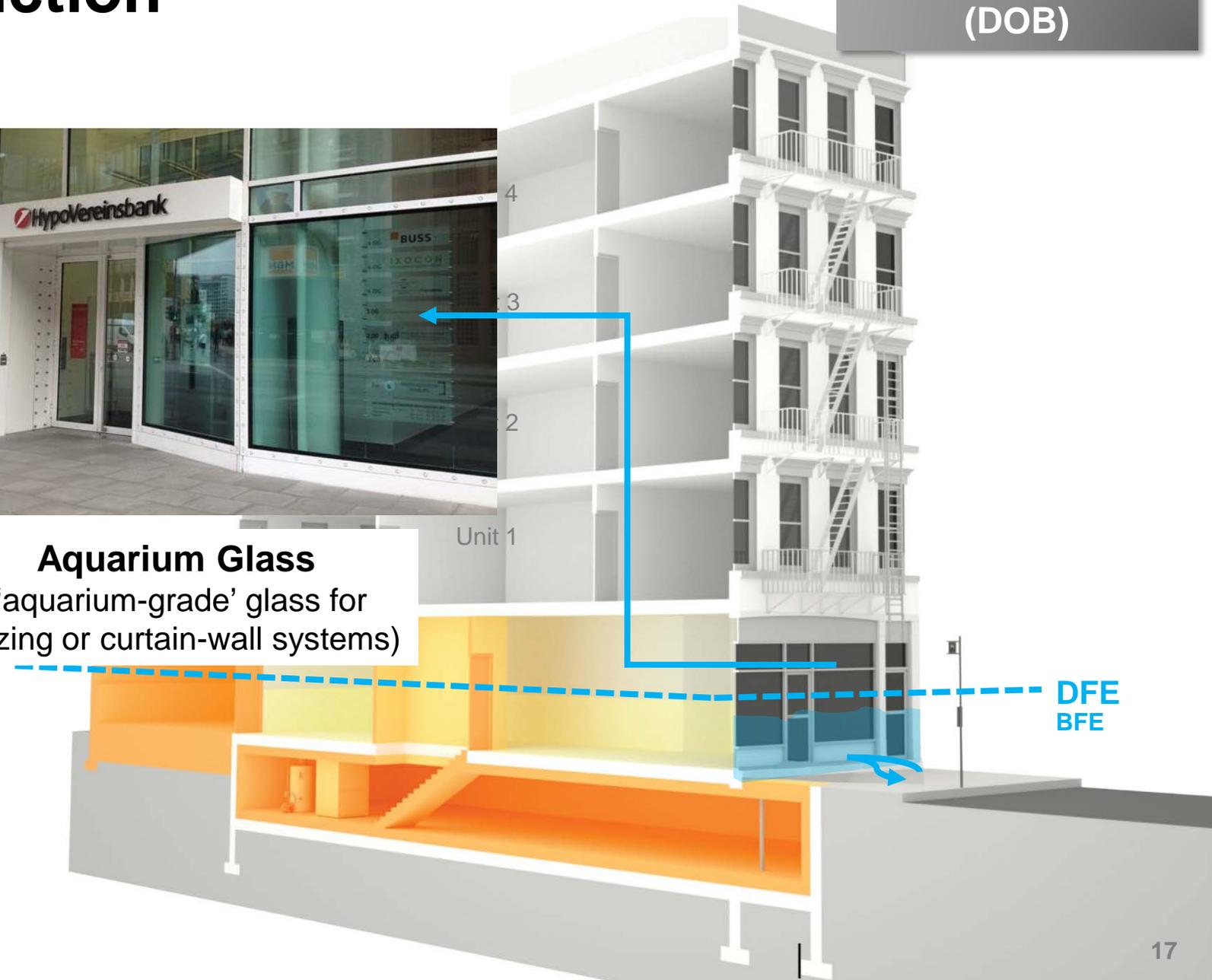
Building Code  
(DOB)



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



**Aquarium Glass**  
(‘aquarium-grade’ glass for  
glazing or curtain-wall systems)



DFE  
BFE

# Flood resilient construction

## Examples of Commercial Buildings

Building Code  
(DOB)

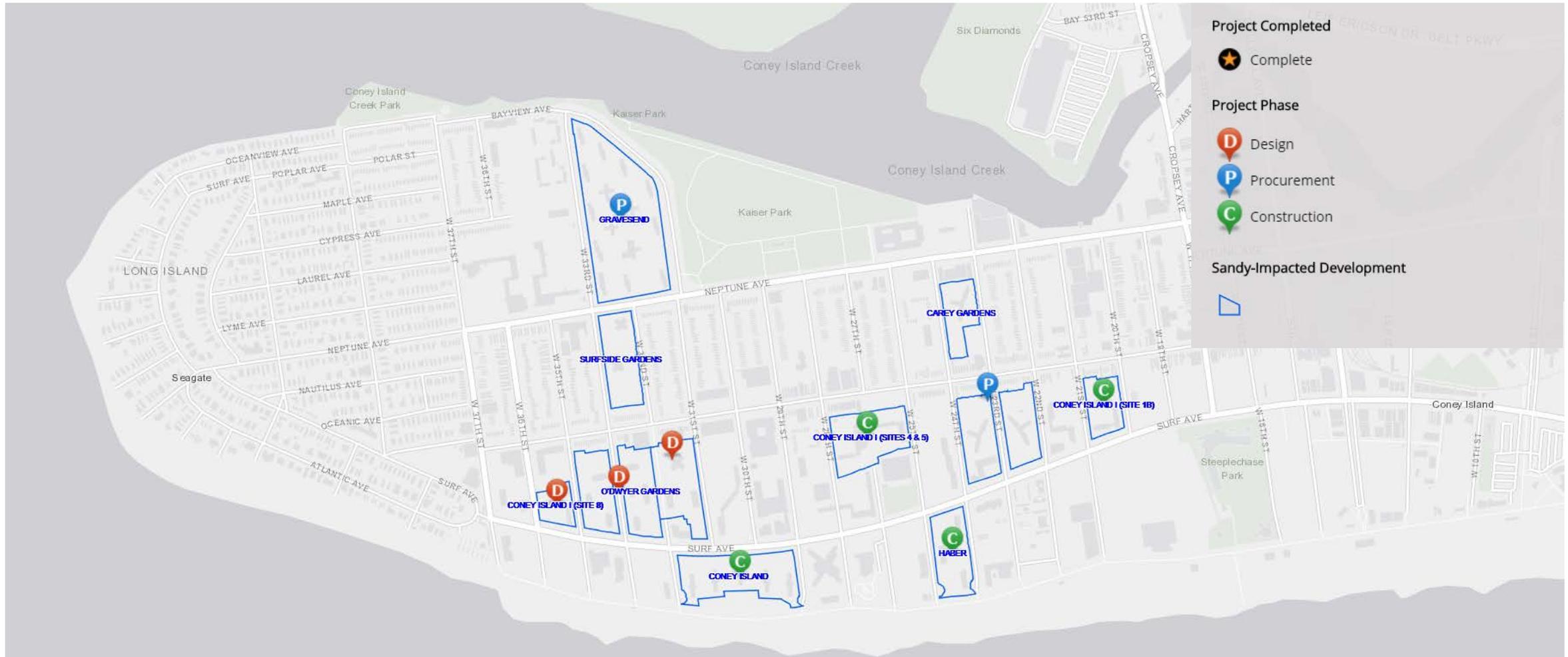


**Commercial Ground Floor**  
Existing Building with access at grade (deployable flood shields)



**Commercial Ground Floor**  
Elevated to DFE ~ 1 foot

# Flood resilient construction NYCHA's Recovery Program



[www1.nyc.gov/site/nycha/about/recovery-resiliency.page](http://www1.nyc.gov/site/nycha/about/recovery-resiliency.page)

# 2013 Citywide Flood Text Temporary Rules



## Main Goal

Facilitate Recovery  
from Hurricane Sandy

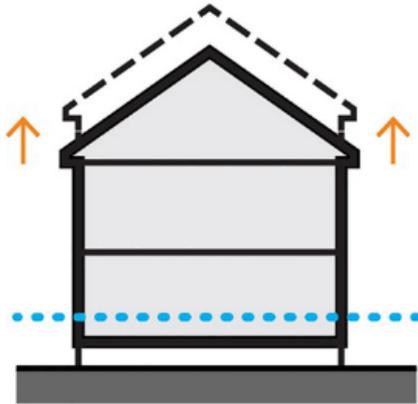
**2013:** Temporary provisions that allow storm-damaged and new buildings to comply with higher flood elevations and resilient construction requirements by **removing zoning barriers**

**2015:** Accelerate post-Sandy recovery in certain areas by **simplifying documentation requirements** and removing disincentives to resiliency investments, through 2022.

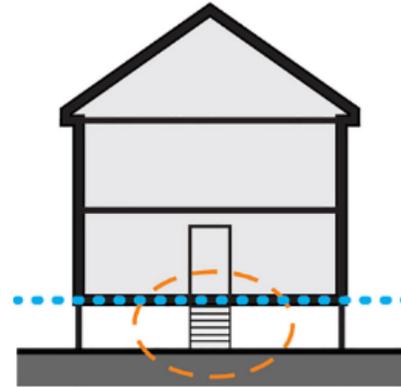
# 2013 Citywide Flood Text

## Amended zoning in six key areas

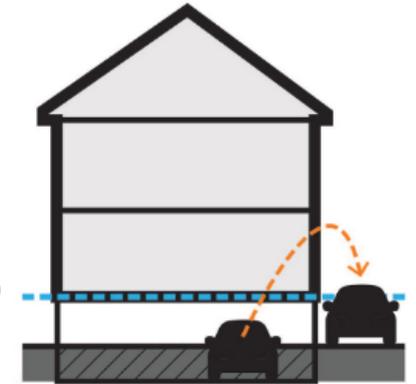
**1**  
**Height**  
Measured from  
flood elevation



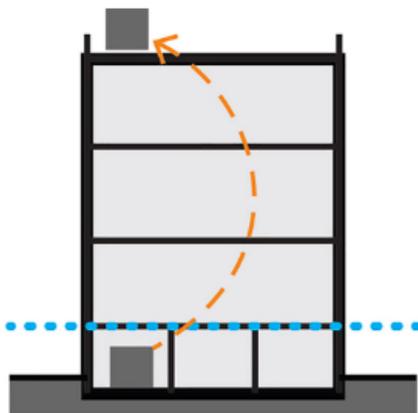
**2**  
**Access**  
Flexibility for  
stairs, ramps, lifts



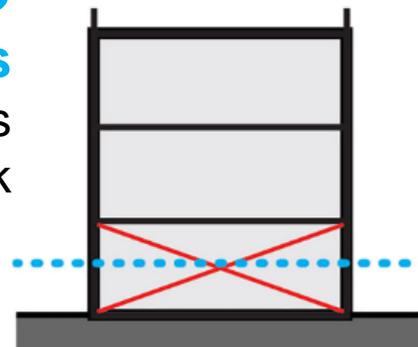
**3**  
**Parking**  
Flexibility to  
relocate parking



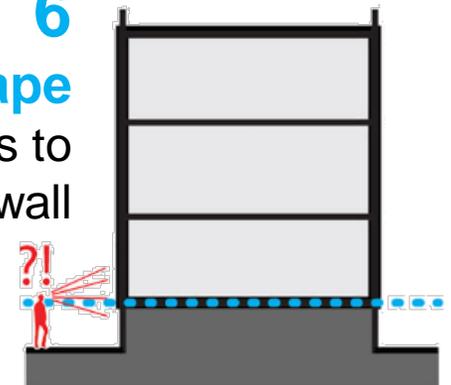
**4**  
**Systems**  
Flexibility to  
relocate/elevate



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



**6**  
**Streetscape**  
Require features to  
mitigate blank wall

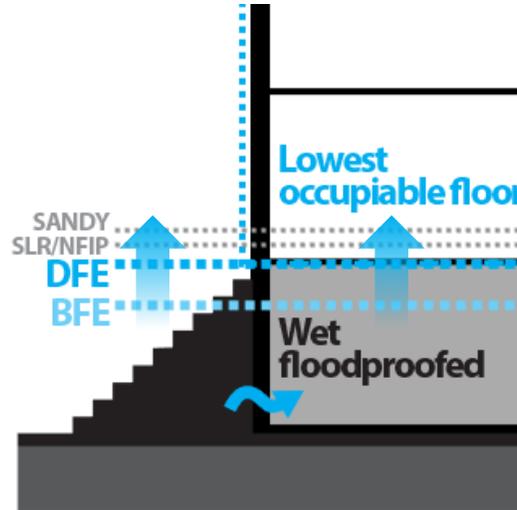


# Flood Text Update Permanent Rules



## Goal 1

**Facilitate Recovery from Future Storms**  
by making the provisions of the temporary Flood Text permanent



## Goal 2

**Promote Long-Term Resiliency**  
by encouraging proactive retrofitting and development that is **safe in the long run**



## Goal 3

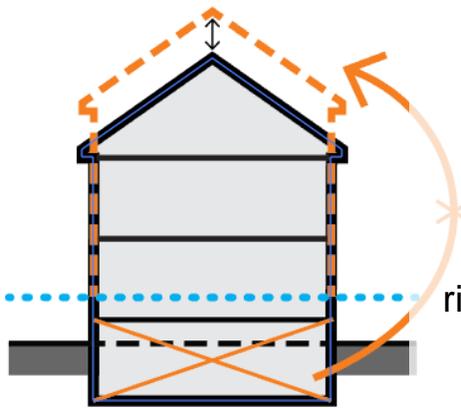
**Enhance Neighborhood Character**  
By encourage good resilient design within **coastal communities**

# Zoning for Flood Resilience Update

## Issues identified by DCP and coastal communities

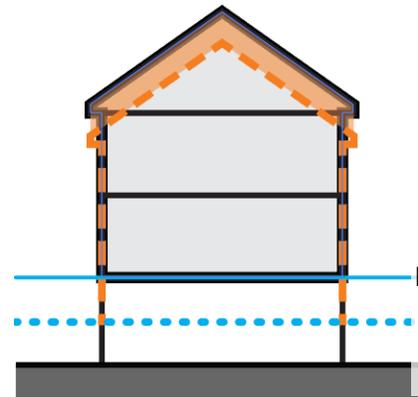
### 1 Subgrade Spaces

Homeowners may face the loss of subgrade spaces when retrofitting



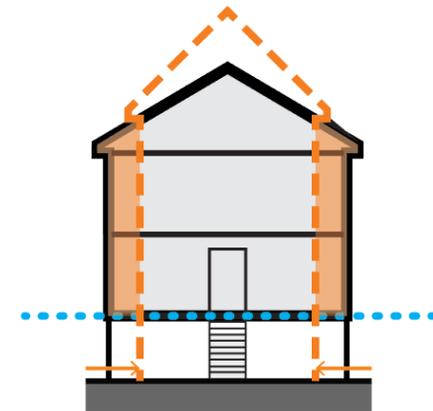
### 2 Future Flood Risk

Property owners may want to address future risk or reduce insurance by over-elevating



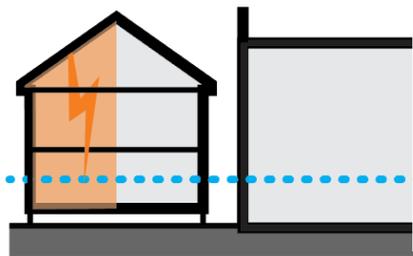
### 3 Old neighborhoods

Old buildings may need more flexibility to rebuild, elevate, or retrofit to resiliency standards



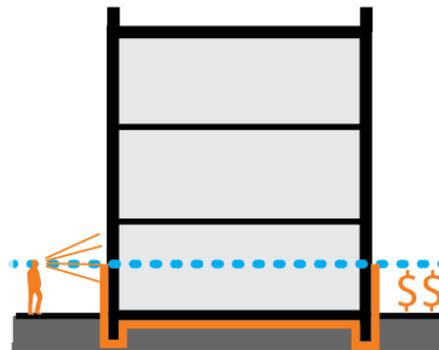
### 4 M Districts

Existing homes in Manufacturing Districts, may not be able to rebuild



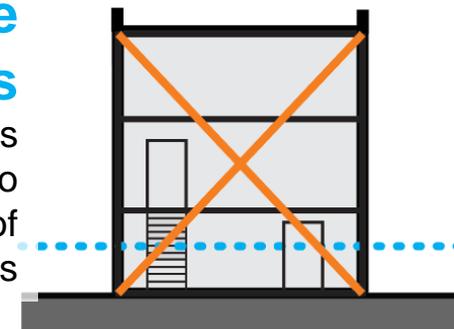
### 5 Active Uses

Current incentives and use options to keep active ground floors, may not be enough



### 6 Active Streetscapes

Design requirements may be needed to mitigate the effects of elevated buildings

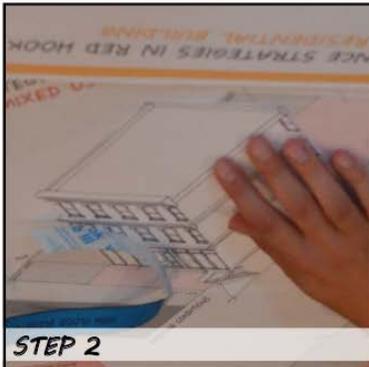


# Zoning Community Workshop

## Coney Island YMCA - October 18, 2017



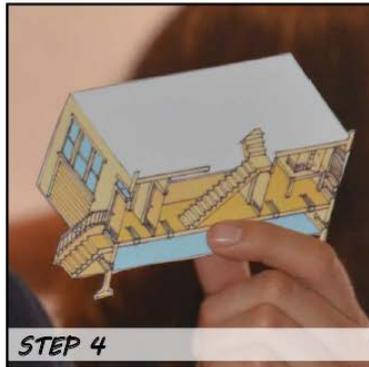
**STEP 1**  
Pick a building in your neighborhood. It can be the place you live, work or are interested in!



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



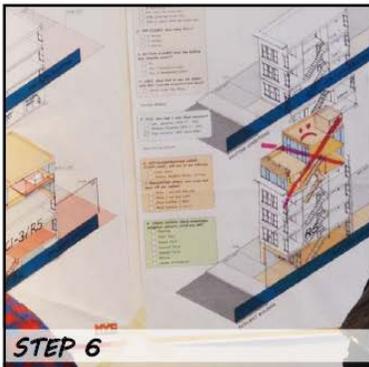
**STEP 3**  
Place your flood elevation (low, medium or high) above existing building and check your risk!



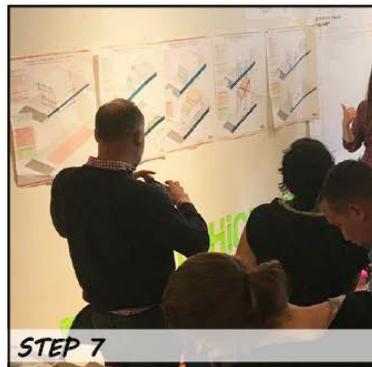
**STEP 4**  
Retrofit your building to become resilient by using available cards (colored).



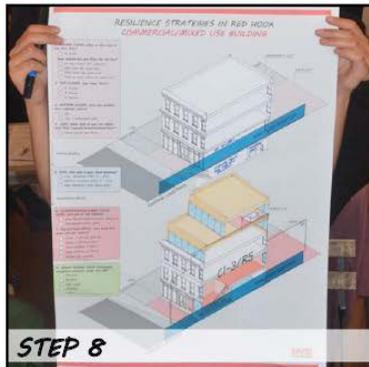
**STEP 5**  
Add the zoning envelope that reflects your neighborhood's zoning above the flood level.



**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!



# Resources



## 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 (available in 6 other languages!)

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

### 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.

#### Why is Flood Insurance Important?

- Floods can cause significant damage to your most valuable asset: your business.
- Even properties far from the coast are at risk of flooding.
- Homeowner and property insurance do not cover damage by flooding. You need a separate policy.
- Federal assistance is not guaranteed in the event of a flood.
- Many property owners are required by federal law to purchase and maintain flood insurance if the property is located in a high-risk flood zone of the 2007 FIRM (to the right), has a federally backed mortgage, or has received federal disaster assistance.

#### How Much Flood Insurance Must a Homeowner Purchase?

Properties with a federally backed mortgage in a high-risk flood zone and those that received federal disaster assistance must maintain flood insurance up to the National Flood Insurance Program (NFIP) limits, or the outstanding mortgage balance, whichever is lower. Failure to do so may require mortgage servicers to purchase a policy for the property—possibly at a higher price—over the cost through monthly mortgage payments.

Homeowners without a federally backed mortgage or outside a high-risk flood zone may carry up to the maximum policy limit with additional contents coverage up to \$100,000 for owners or renters. Co-tenanted multifamily buildings and business properties may be covered up to \$500,000. Business and tenants can also purchase up to \$100,000 in contents coverage.

NYC Planning | November 2016

### 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.

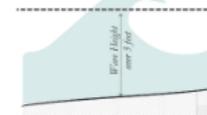
#### Flood Risks

Hurricanes, tropical storms, nor'easters, intense rain storms, and even extreme tides are the primary causes of flooding in NYC.

For building code, zoning, and planning purposes, flood risk in NYC is regulated by FEMA's 2015 Preliminary Flood Rate Maps (PFIRMs).

- PFIRMs show the extent to which waters are expected to rise during a storm event that has a 1% annual chance of occurring. This height is denoted as Flood Elevation (FE) on the maps.
- The 1% annual chance floodplain, sometimes referred to as the 100-year floodplain, is the area that is expected to be flooded once every 100 years. In the 1% annual chance floodplain, there is a 26% chance of flooding over the life of a 30-year mortgage.

For flood insurance purposes, the 1% annual chance floodplain is divided into two zones: the V Zone (Vulnerability Zone) and the Coastal Flood Zone (CFZ). Properties in the V Zone are required to purchase flood insurance, while properties in the CFZ are not.



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NYC Planning | November 2016

### NYC PLANNING Flood Resilience Zoning

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.

#### Overview

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

The Flood Text modified zoning to regulate building construction in the floodplain by enabling new and existing buildings 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 more inclusive and incorporate lessons learned during the rebuilding process.

#### Where is the Flood Text Applicable?

The Flood Text is available to build in the 1% annual chance floodplain.

These rules can be found in Article 24 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, are available to all buildings in the floodplain, even if not fully compliant with Appendix G.

For more information about the Flood Resilience Zoning Text, visit [www.nyc.gov/resilientneighborhoods](http://www.nyc.gov/resilientneighborhoods).

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

NYC Planning | March 2017 | Flood Resilient Construction

### 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

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.



- Site is filled to the lowest adjacent grade
- Space below the DFE is for parking, building access or minor storage
- Mechanical systems are above the DFE
- Plants and stair turns improve the look of the building from the street
- Rooftop addition replaces lost below grade space
- Commercial space is dry floodproofed with removable barriers

NYC Planning | November 2016 | Flood Resilient Construction

# Resources

## FloodHelpNY

Everything you need to know about flood insurance and your flood risk



**Find Your Property on the New Proposed Flood Map**



**See How Map Changes Could Affect Your Insurance Rate**



**Get Tips and Resources to Protect Your Home**



**Stay Updated on Changes to Flood Insurance Policies**



A project of the



**CENTER for NYC NEIGHBORHOODS**



**FloodHelpNY.org**

# Resources

## FloodHelpNY

Everything you need to know about flood insurance and your flood risk



Professional audit and elevation certificate

**FREE**

Valued at over \$1800

### 3 out of 4

homeowners in high-risk zones without an elevation certificate are **overpaying** for flood insurance.



### Resiliency Report

After we inspect your home and assess its flood risk, we'll send you a detailed technical report, complete with measurements and information on which retrofits (i.e., raising your mechanical systems) can make you more flood-safe.



### Elevation Certificate

We'll also send you a document that certifies your home's elevation. If you live in a high-risk flood zone, the elevation certificate can keep your flood insurance rate from skyrocketing.

 [FloodHelpNY.org](https://FloodHelpNY.org)