



WETLANDS HELP TO SLOW DOWN FLOOD WATERS AND ACCELERATE RECOVERY BY ABSORBING FLOODS

BEING PREPARED TO EVACUATE IS IMPORTANT IN THE EVENT OF AN APPROACHING STORM.

INDUSTRIAL BUILDINGS SHOULD PRIORITIZE ELEVATING VALUABLE EQUIPMENTS ABOVE THE FLOOD LEVEL.

COMMUNITY PREPAREDNESS

AND COMMUNITIES NEED RESILIENT TOO. THE CITY IS WORKING TO MAKE SURE RESIDENTS AND BUSINESSES ARE PREPARED NOT JUST FOR THE SANDY, BUT FOR ANY EMERGENCY WE FACE.

Building a Resilient **NEW YORK CITY**

Zoning for Coastal Flood Resiliency

INFRASTRUCTURE HARDENING

HARDENING INFRASTRUCTURE SYSTEMS FROM FLOODING HELP TO PREVENT THE LOSS OF POWER, COMMUNICATIONS, AND TRANSPORTATION NETWORKS WHEN STORMS OCCUR.

LIVING SPACES LOCATED ABOVE FLOOD LEVEL

LIVING SPACES LOCATED ABOVE FLOOD LEVEL

COMMERCIAL GROUND FLOOR

DRY FLOODPROOFED MECHANICAL ROOM

NYC
PLANNING

ALL RESIDENTIAL BUILDINGS NEED TO ELEVATE UNITS ABOVE THE FLOOD LEVEL.

Queens Community Board 1
September 4, 2019

Today's Agenda

- 1. Introduction | Context**
- 2. Preliminary Recommendations | Summary**
- 3. Additional Resources**

Zoning for Coastal Flood Resiliency

1. Introduction

Context



Alley Pond Creek, Queens



Upper Bay

*The major challenge we face with creating citywide zoning rules for NYC's flood resiliency is that there are **520 miles of waterfront in NYC**, and each mile faces different flood risks that require particular strategies to make them flood resistant*



Rockaways, Queens



Williamsburg, Brooklyn

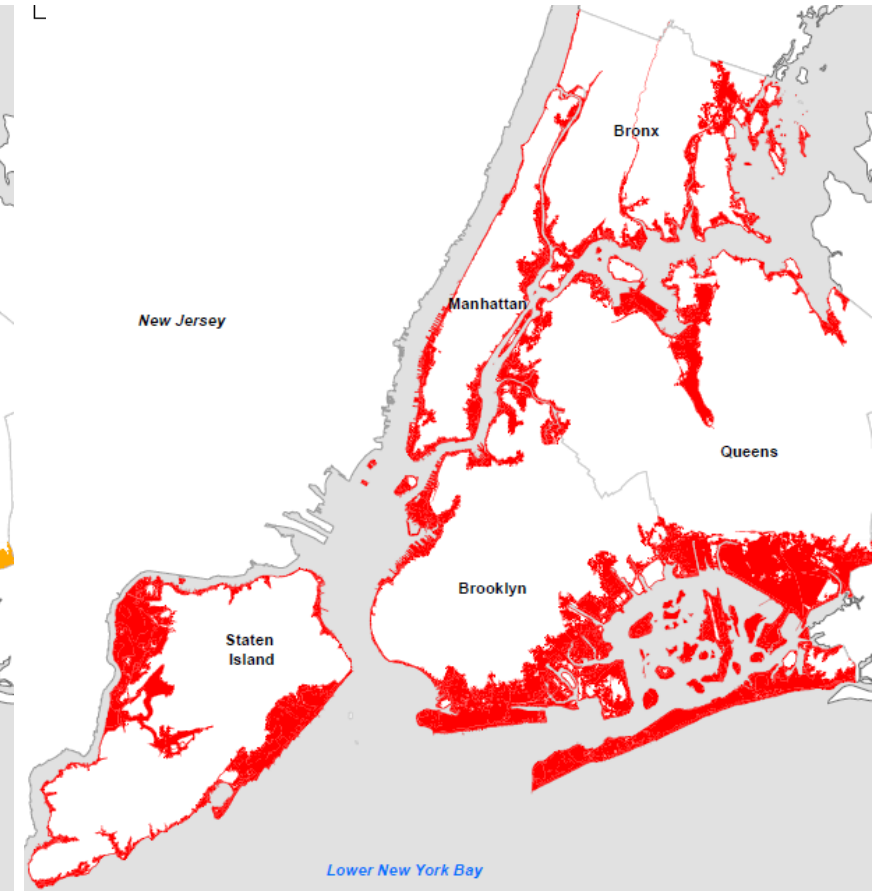
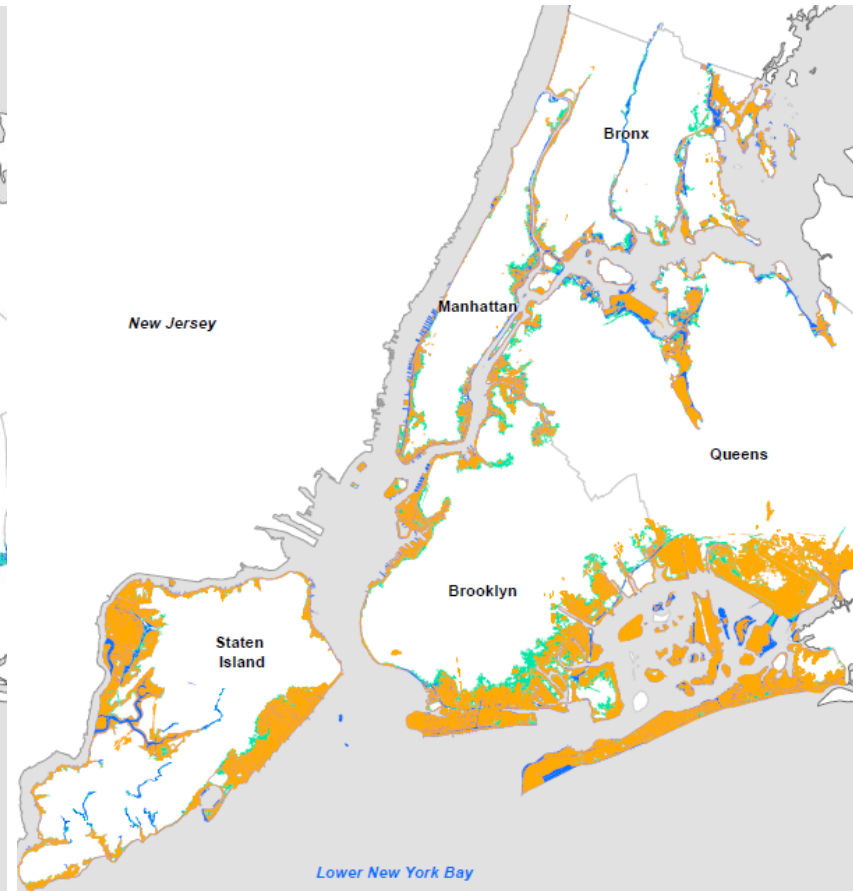
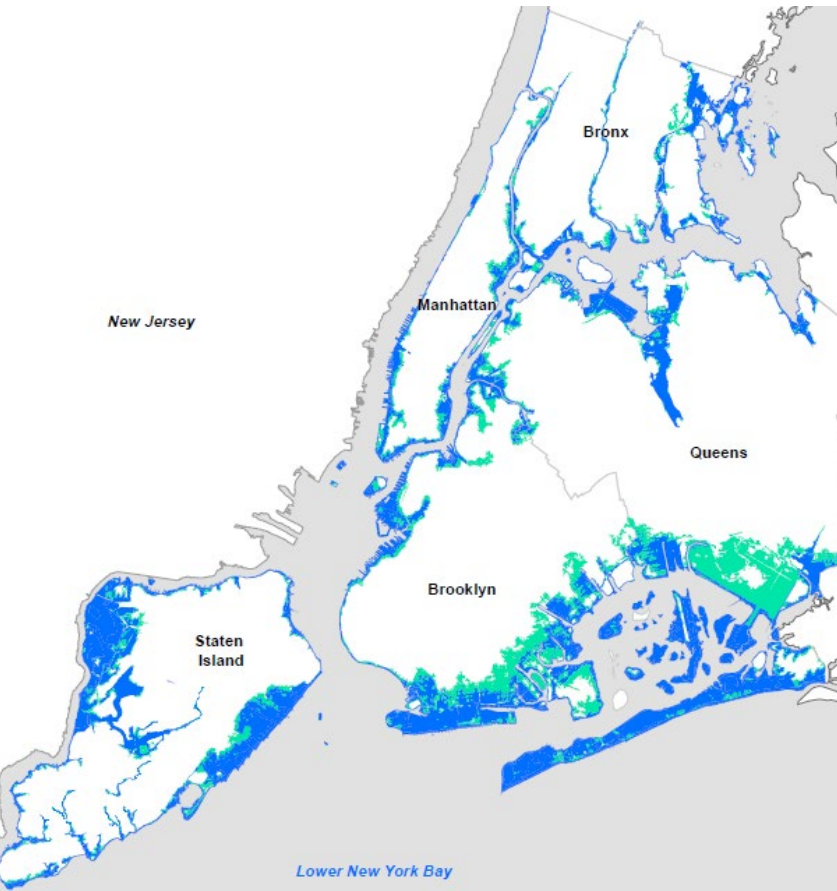
Citywide Flood Risk

NYC's flood risk is high and will increase.

The city's current flood risk is high with ~782,800 residents in the floodplain

Sandy inundated all lots in the high-risk zone, but also 50% of lots in the moderate-risk area

The current moderate-risk zone will likely become the future high-risk flood zone.



High-risk: 1% annual chance floodplain (FEMA) ■
Moderate-risk: 0.2% annual chance floodplain (FEMA) ■

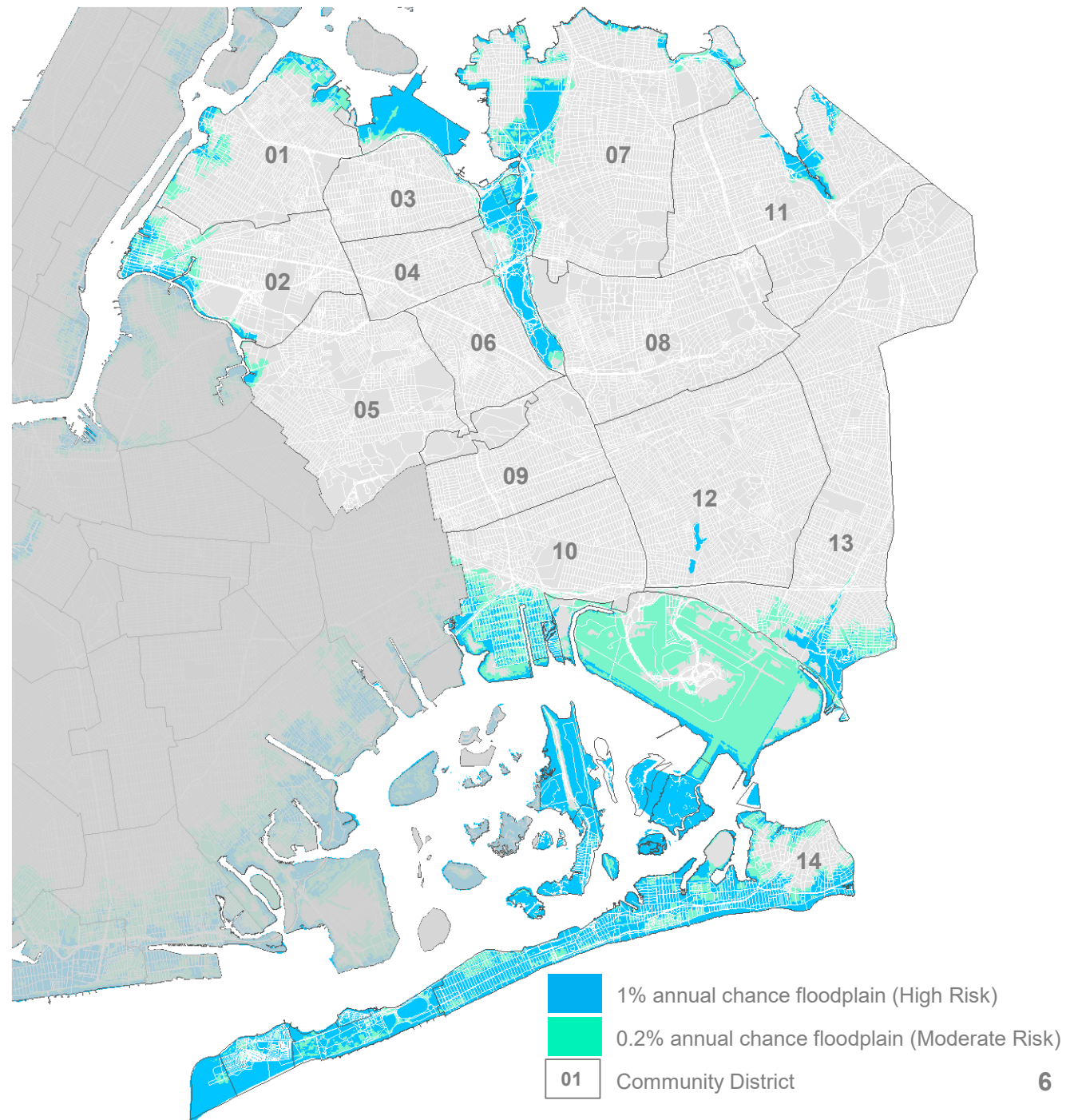
Hurricane Sandy Storm Surge ■

2050s 1% Annual Chance Floodplain (NPCC) ■

Flood Risk Queens

	1% annual chance floodplain (High Risk)	0.2% annual chance floodplain (Moderate Risk)	TOTAL
Citywide Total # of Lots	65,582	36,723	102,305
Queens Total # of Lots	20,723	5,666	26,389

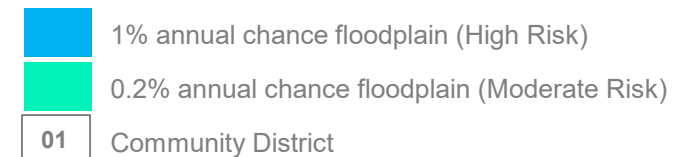
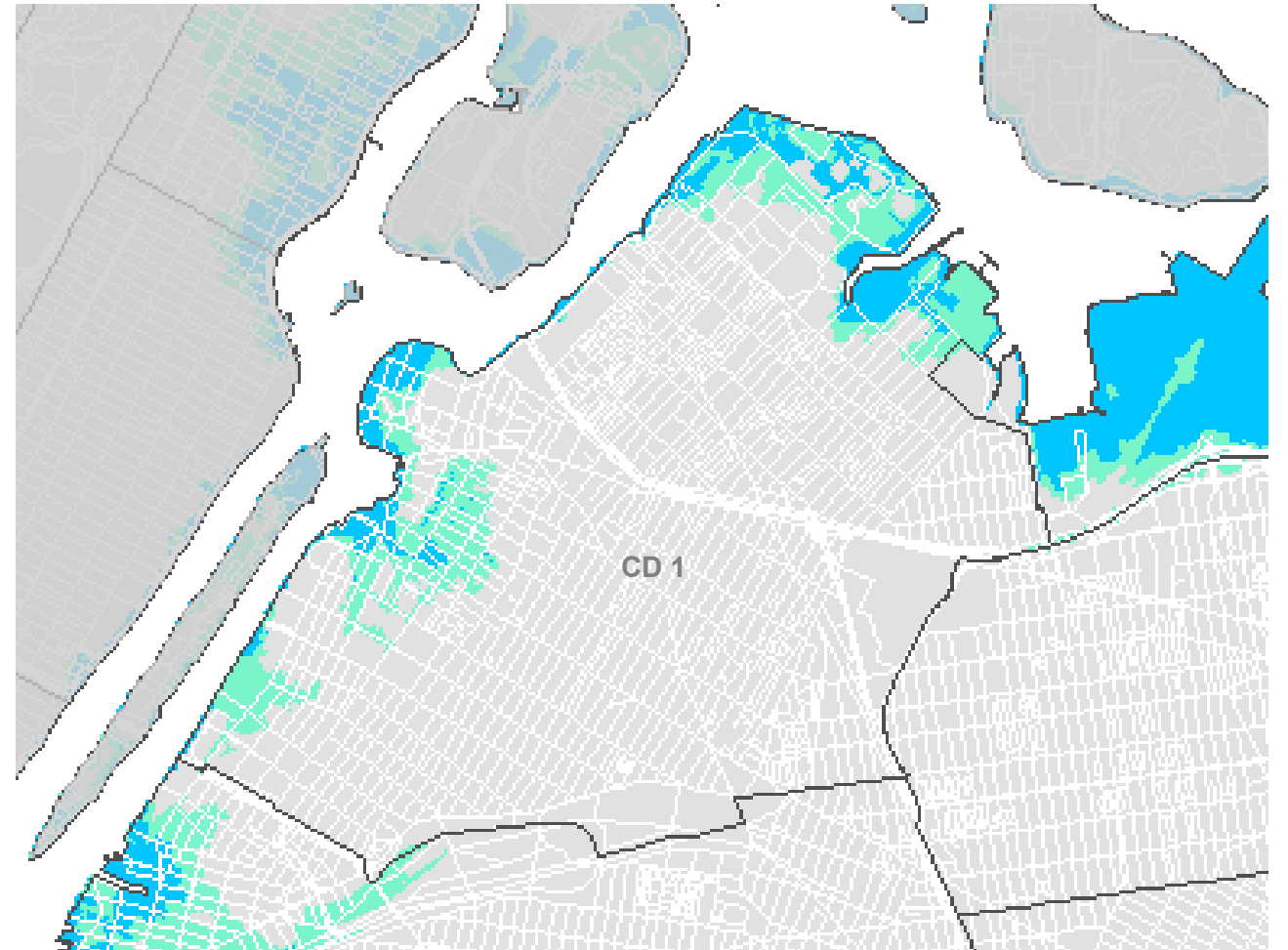
	1% annual chance floodplain (High Risk)	0.2% annual chance floodplain (Moderate Risk)	TOTAL
Citywide Total # of Buildings	80,907	44,636	125,539
Queens Total # of Buildings	28,566	7,078	35,644



Flood Risk

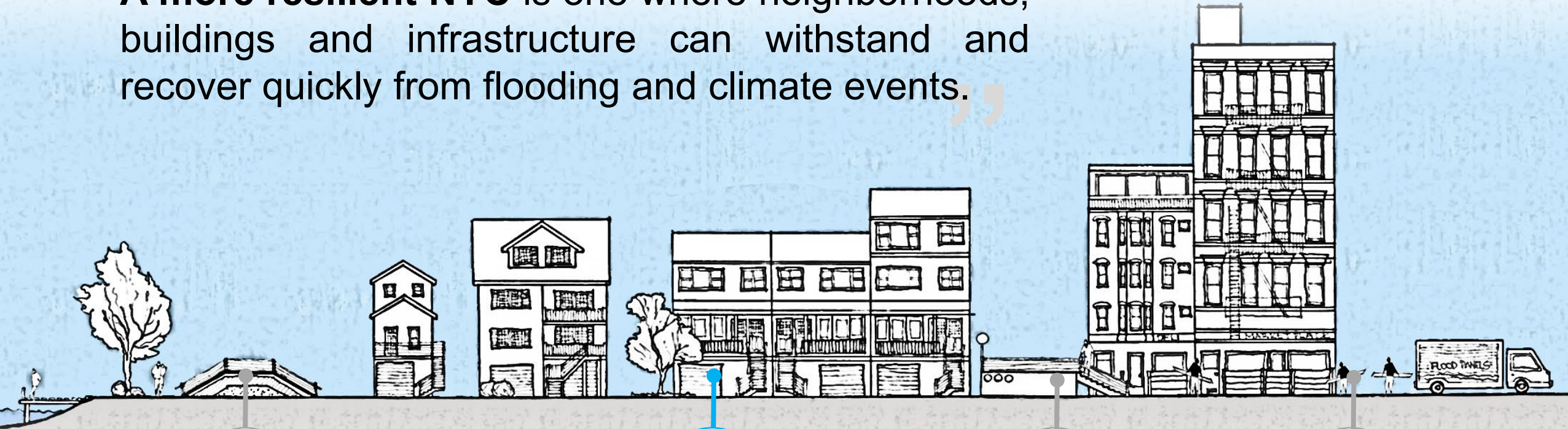
Queens Community District 1

- 1,961 (8%) of CD1 buildings are in the floodplain
- 20% of buildings in the floodplain are multi-family residential
- 80% of buildings in the floodplain were built before 1961
- 60% of buildings in the floodplain have a full basement below grade



#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

How are buildings in the floodplain regulated?

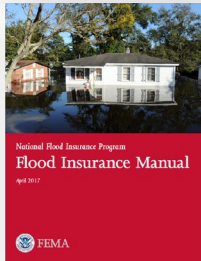


FEMA Federal Level



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



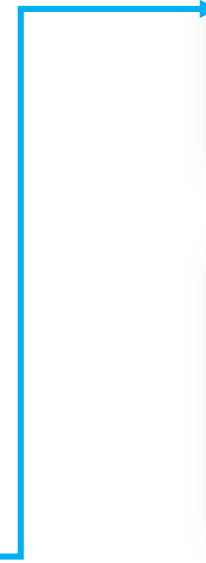
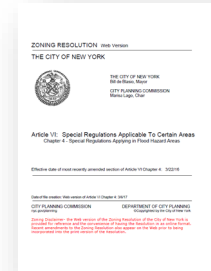
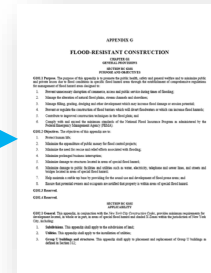
NYC Municipal Level

Building Code (DOB)

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

Zoning Resolution (DCP)

Zoning accommodates these regulations by removing zoning barriers



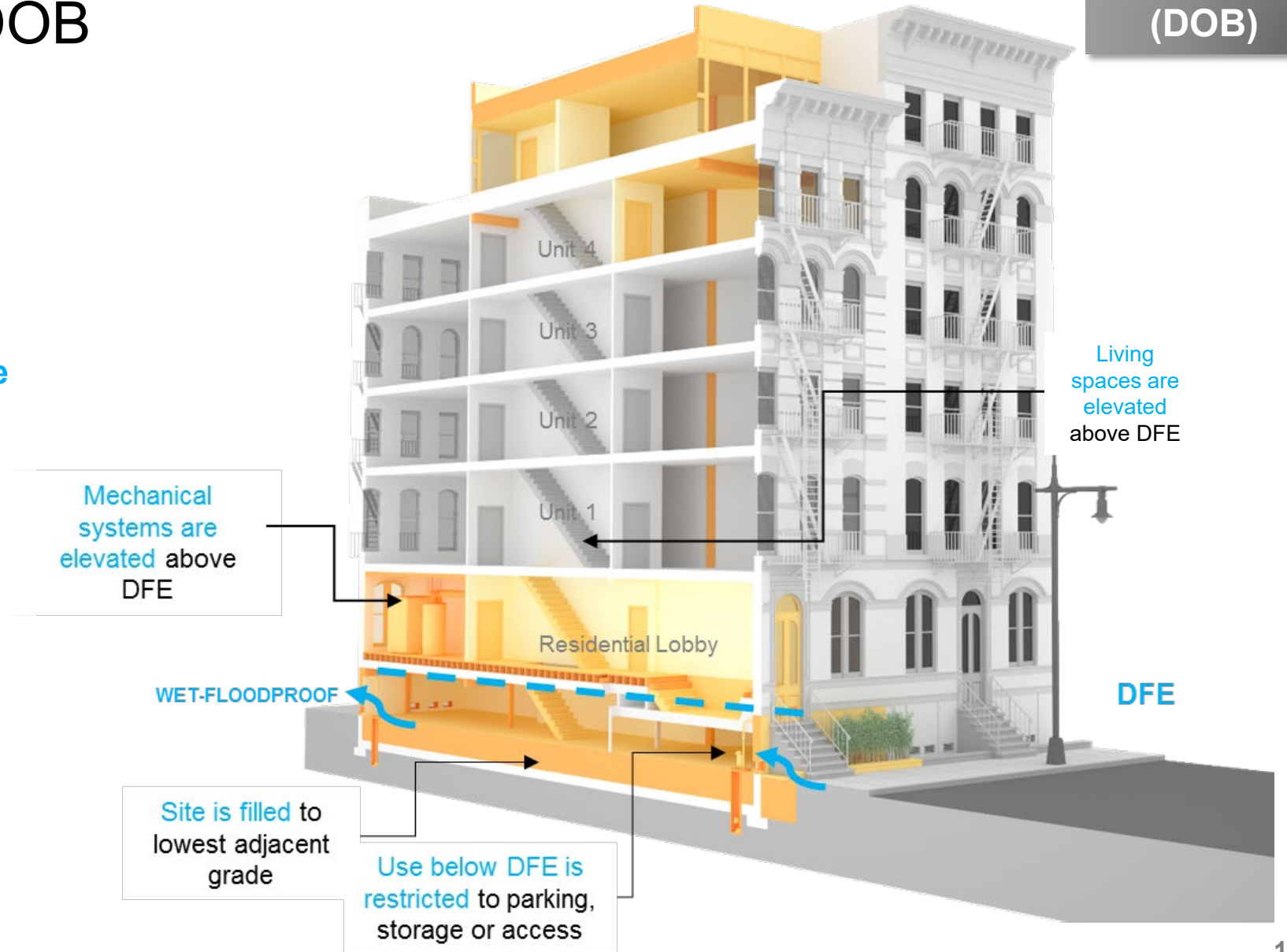
Flood resilient construction

Currently required by DOB

Building
Code
(DOB)

NYC Building Code requires residential buildings in the floodplain to:

- Wet flood proof the ground floor
- elevate all living spaces above the Design Flood Elevation (DFE).
- elevate mechanical equipment above the Design Flood Elevation (DFE).
- Only parking, storage, and building access can be located below the Design Flood Elevation (DFE).



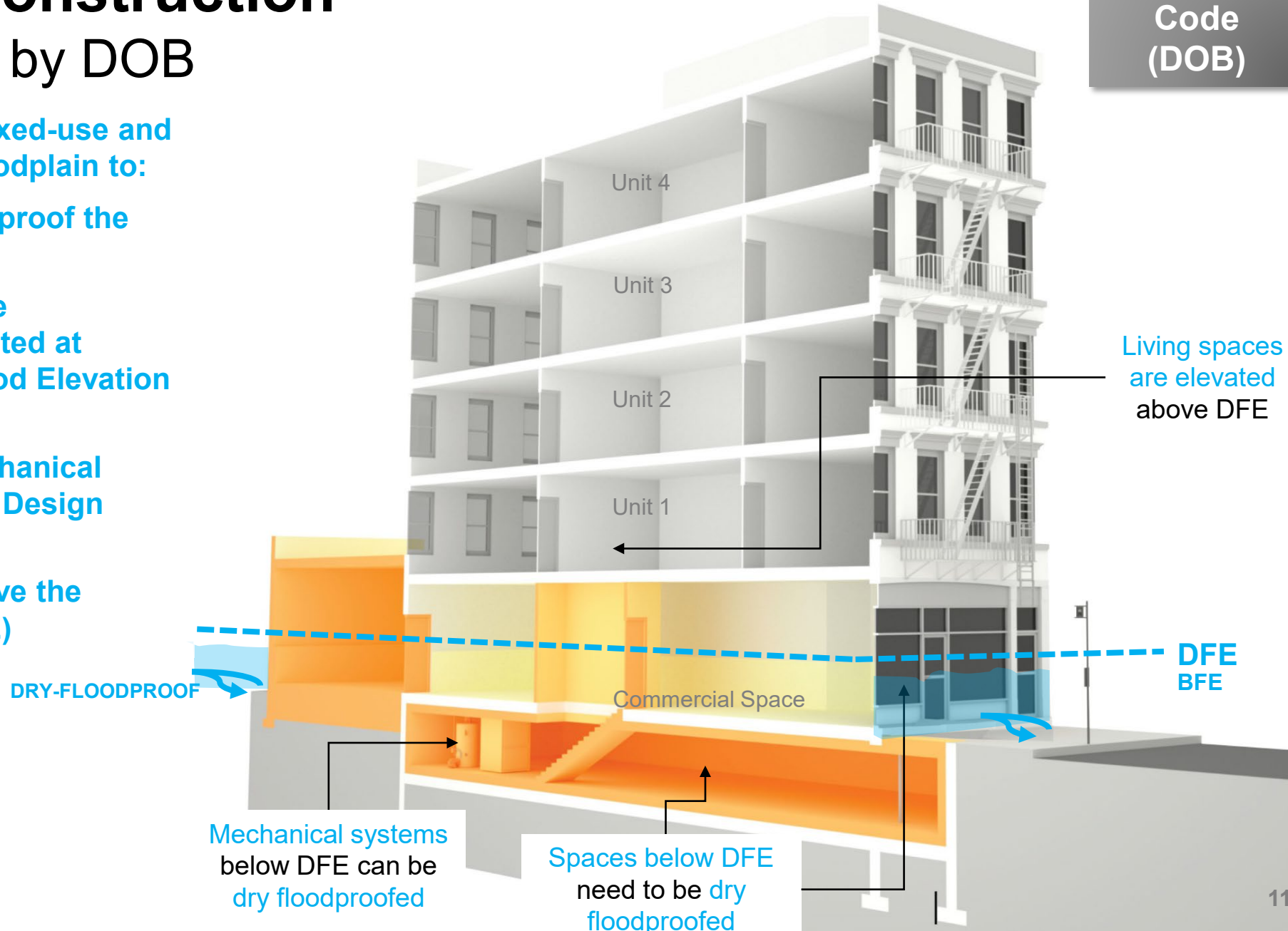
Flood resilient construction

Currently required by DOB

Building Code (DOB)

NYC Building Code requires mixed-use and commercial buildings in the floodplain to:

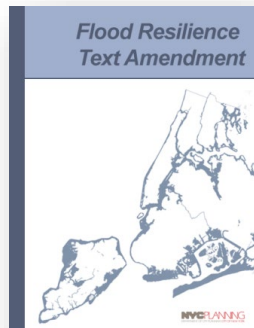
- Wet flood proof or dry flood proof the ground floor
- Dry flood proofing allows the commercial space to be located at grade, below the Design Flood Elevation (DFE)
- If dry flood proofed, the mechanical equipment can be below the Design Flood Elevation (DFE).
- elevate all living spaces above the Design Flood Elevation (DFE)



DCP's work since Hurricane Sandy

From recovery to long-term resiliency

Zoning Text Amendments (temporary regs)



2013- FT1
Temporary Provisions



2015- SNRN
Removed additional zoning barriers

Follow-up Actions / Outreach Process

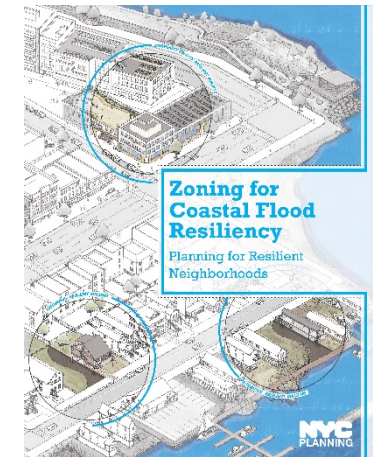


Citywide / Neighborhood Studies
(2014-2017)



Community Outreach Workshops
(2016-2018)

Preliminary Recommendations (permanent-regs)



Zoning for Coastal Flood Resiliency
(2018-2019)

Zoning for Coastal Flood Resiliency

2. Preliminary Recommendations Summary

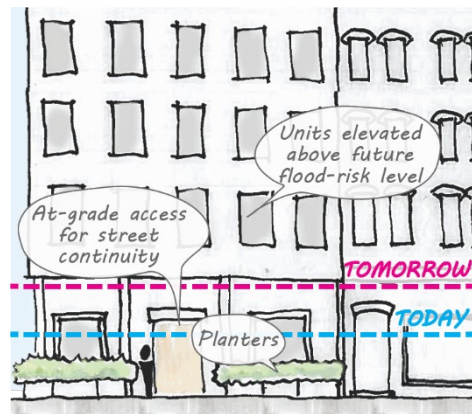
Zoning for Coastal Flood Resiliency

Overview of project's goals

Zoning for Coastal 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.



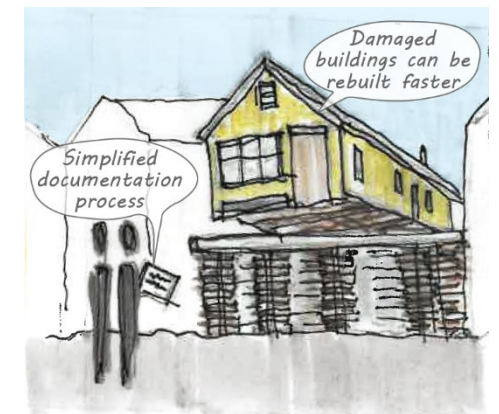
1. Encourage resiliency throughout the city's current and future floodplains



2. Support long-term resilient design of all building types by offering flexibility in the zoning framework



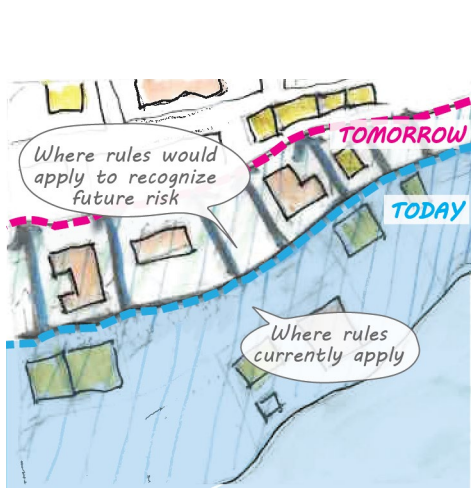
3. Allow for adaptation over time through partial resiliency strategies



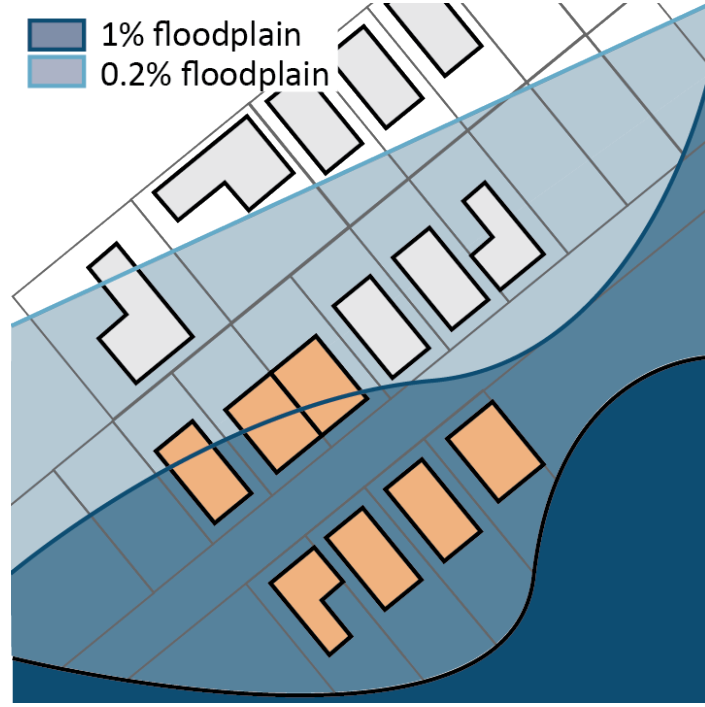
4. Facilitate future-storm recovery by removing regulatory obstacles

Zoning for Coastal Flood Resiliency

An expanded geography



1. Encourage resiliency throughout the current and future floodplains



Existing Rules
are only available to buildings within the 1% floodplain (High Risk Area)



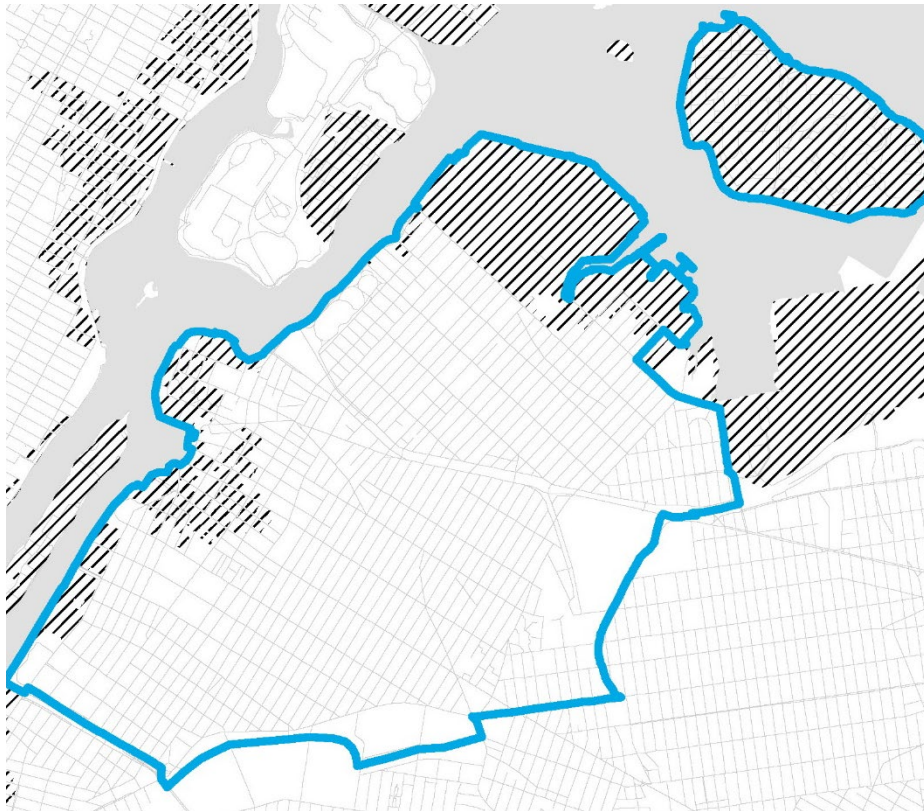
Proposed Rules
will be available to lots within the 0.2% floodplain (Moderate Risk Area)

Applicability

General Applicability

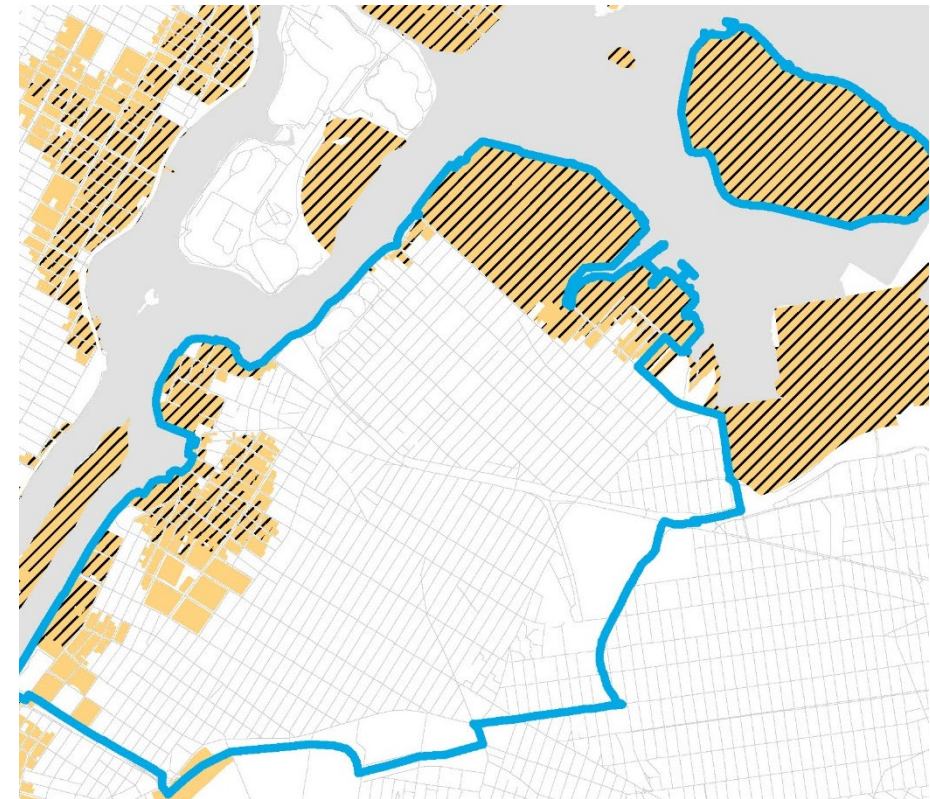
Applicability in Queens Community District 1

Existing FT1 Optional Rules



 Rules available for buildings within the 1% floodplain

Proposed Optional Rules

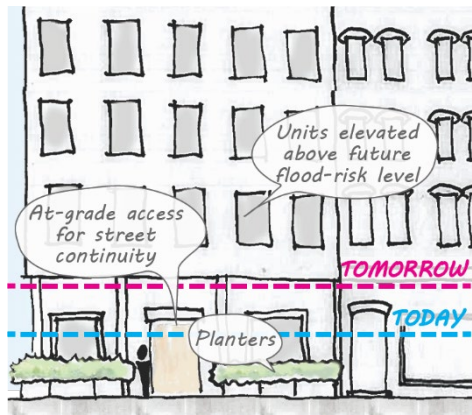


 Existing rule  Rules available for lots within the 1% and 0.2% floodplains



Zoning for Coastal Flood Resiliency

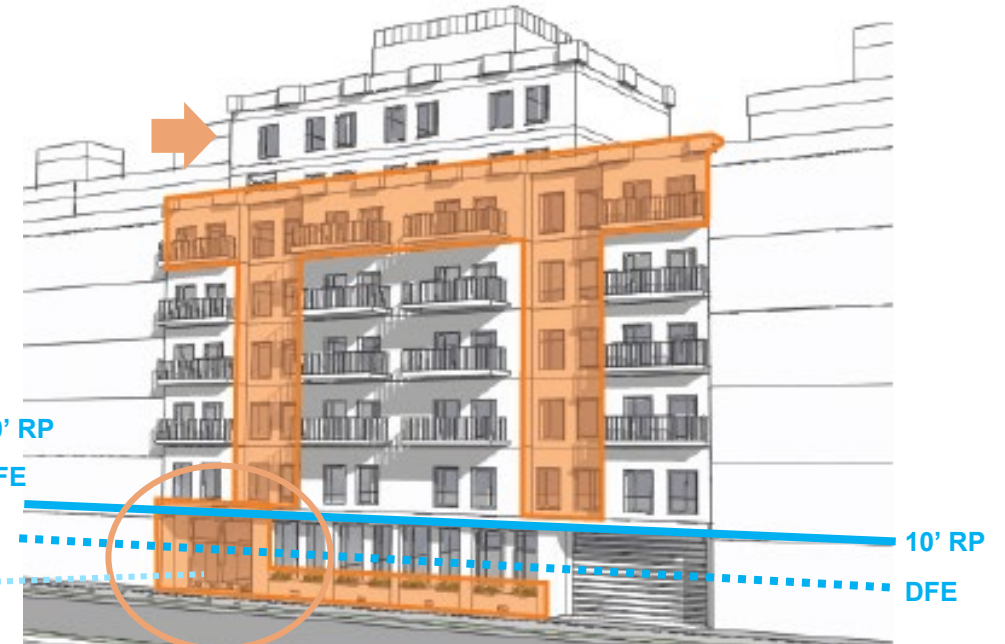
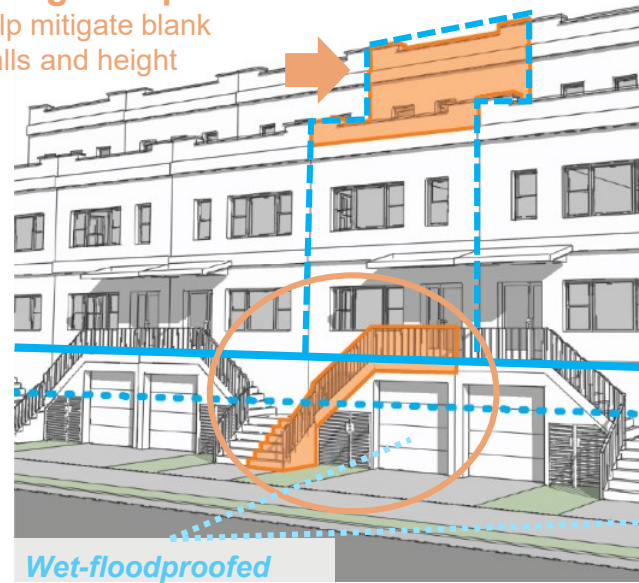
An enhanced Building Envelope



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

Design Requirements

help mitigate blank walls and height



Height and floor area allowances help future-proof units and place ADA access internally

Residential Buildings

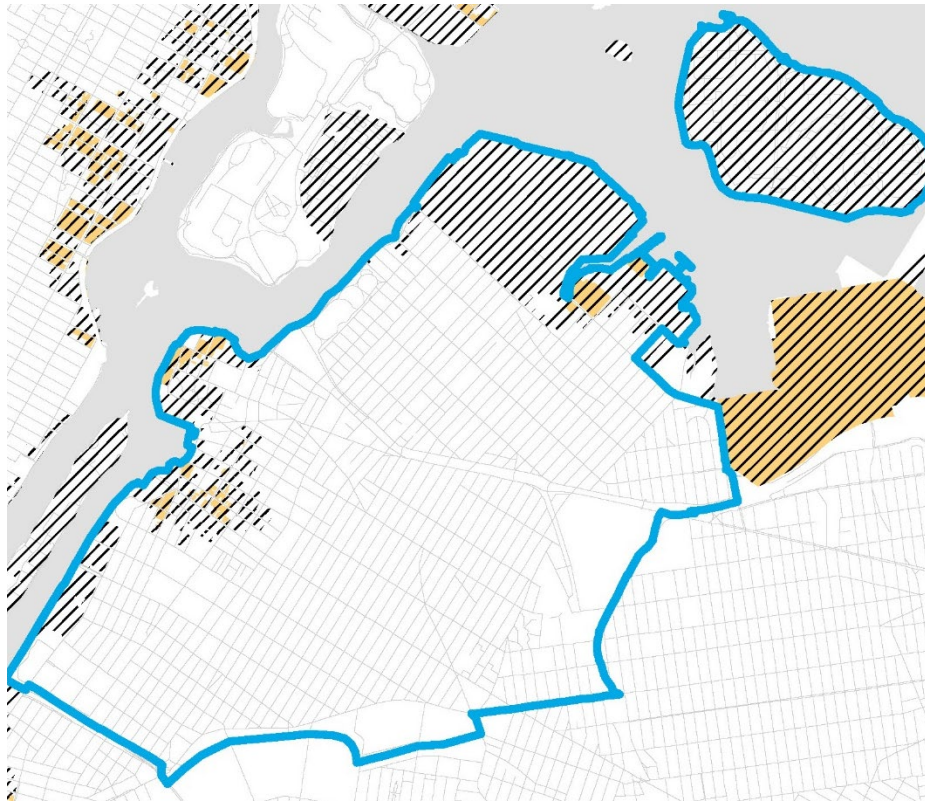
- Height allowances: allow zoning envelope to be measured from the DFE or a higher Reference Plane → 10' (within 1% floodplain) or 5' (within the 0.2% floodplain)
- Floor area exemptions for wet-floodproofed spaces (ex. residential lobbies) will help incentivize living spaces to be placed well-above flood risk levels.
- Design requirements will help mitigate the issues caused from elevating, like blank walls and height.

Building Envelope

Height Allowance

Applicability in Queens Community District 1

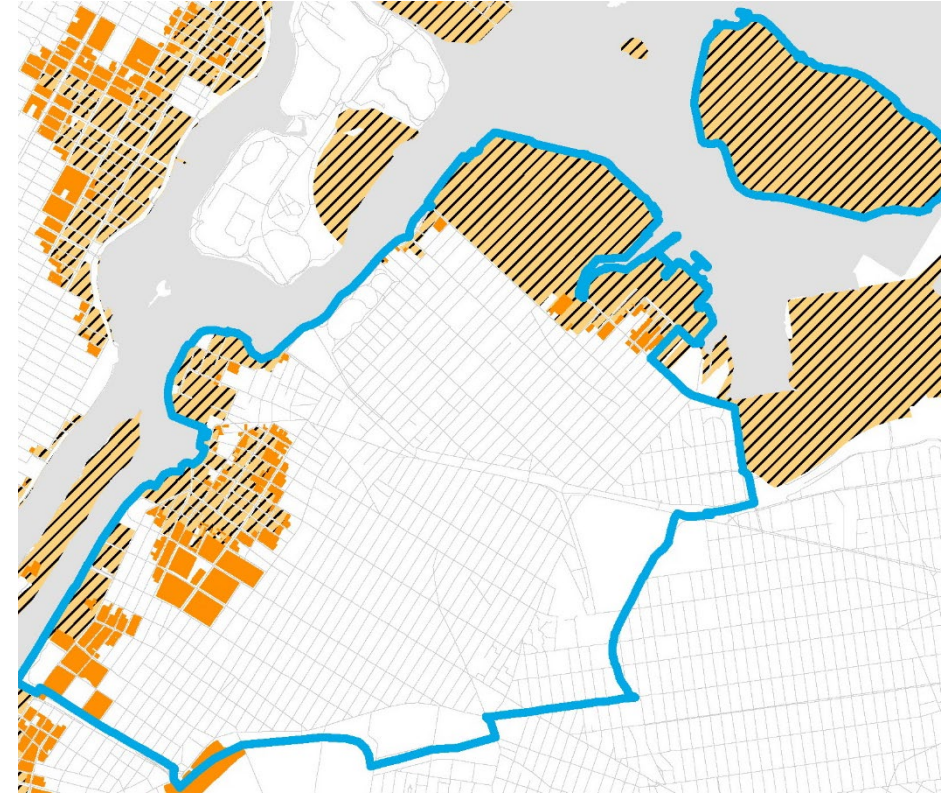
Existing FT1 Optional Rules



 Height can be measured from DFE

 Height can be measured from DFE or up to 12' RP whichever is higher

Proposed Optional Rules



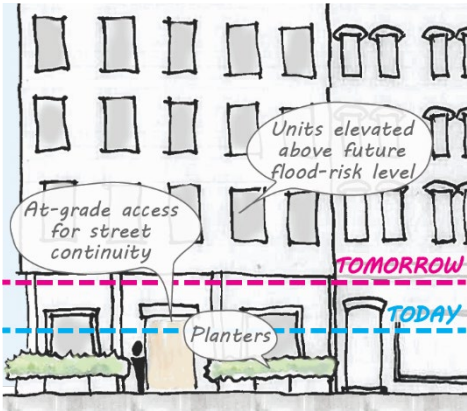
 Height can be measured from DFE or up to 10' RP whichever is higher

 Height can be measured from up to 5' RP

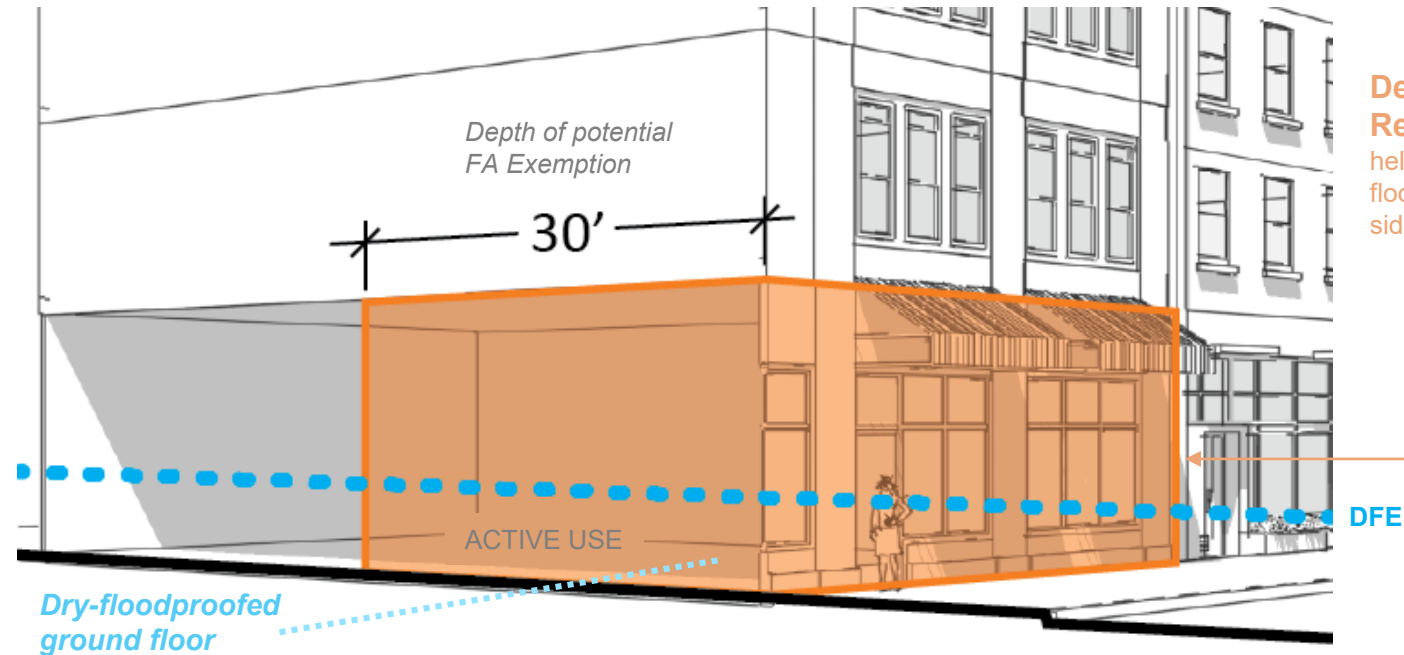


Zoning for Coastal Flood Resiliency

An enhanced Building Envelope



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



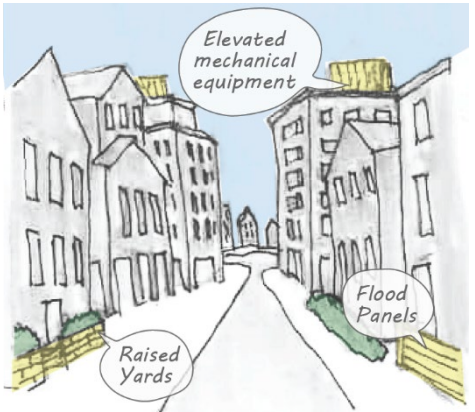
Design Requirements help ensure active ground floors with access at the sidewalk level

Commercial & Mixed-Use Buildings

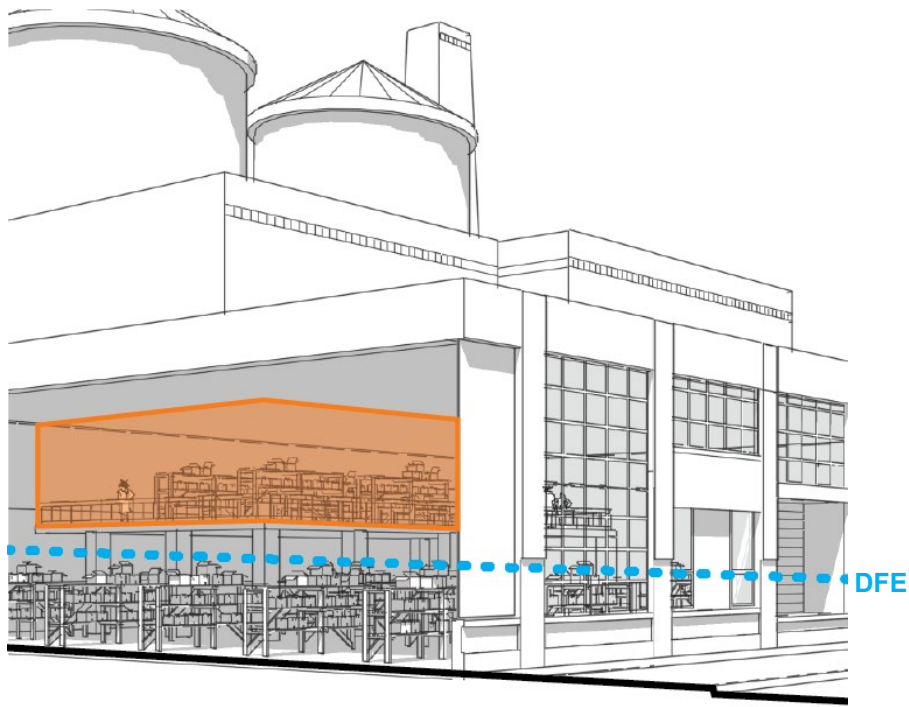
- Floor area exemption for the first 30ft from the street in dry-floodproofed spaces will incentivize active uses to be kept at sidewalk level
- Design requirements will help ensure active ground floors

Zoning for Coastal Flood Resiliency

Alternatives for the relocation of important equipment

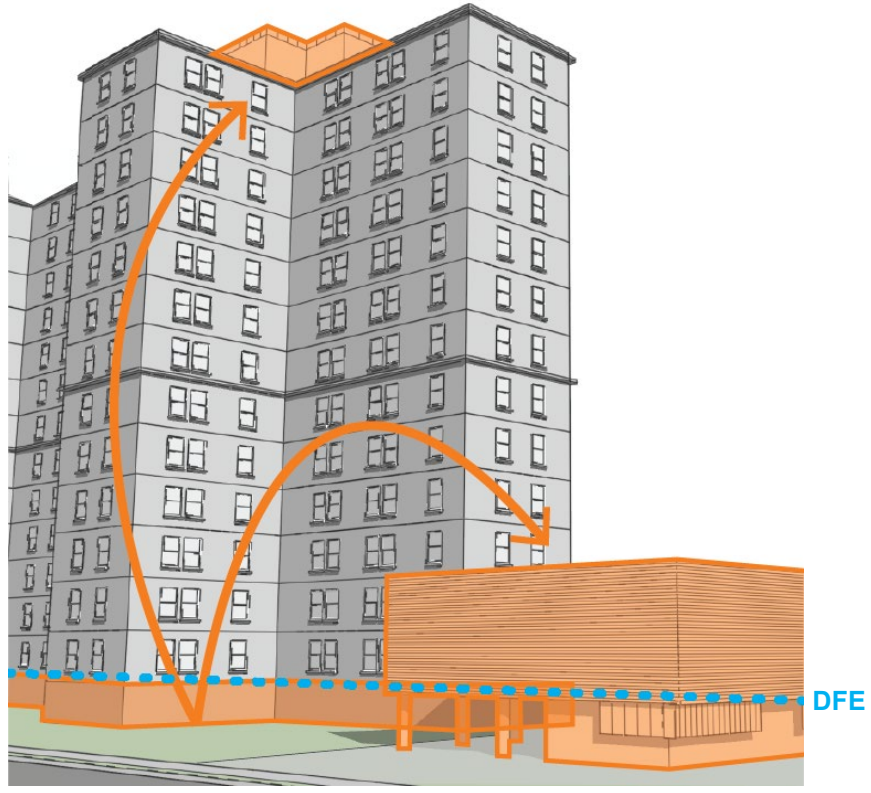


3. Allow for adaptation over time through incremental retrofits



Floor Area Exemptions

for existing industrial buildings to allow the creation of small mezzanine spaces or a 2nd floor to store important equipment above the Design Flood Elevation (DFE)



More flexible permitted obstructions

provide more options for mechanical equipment to be relocated to either above the roof or within separate structures. Especially applicable to NYCHA Campuses

Zoning for Coastal Flood Resiliency

3. Additional Resources

Additional Resources



NYC Flood Hazard Mapper

www.nyc.gov/floodhazardmapper

Info briefs on our website that cover everything related to flood risk in NYC. Available in 6 languages.

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, and has received federal disaster assistance.

How Much Flood Insurance Must a Homeowner Purchase?

Properties with a federally backed mortgage or outside a high-risk flood zone and those that received federal disaster assistance are required to maintain flood insurance up to the NFIP limits, or the outstanding mortgage balance, whichever is lower. Failure to do so may require mortgage servicers to purchase a private policy—possibly at a higher price—on 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-ops, multifamily buildings and business properties may be covered up to \$500,000. Business and tenants can also purchase up to \$500,000 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.

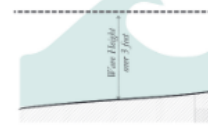
Flood Risks

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 Risk 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 over the life of a 30-year mortgage that a property will be flooded.

For flood insurance purposes, the 1% annual chance floodplain with a federally backed mortgage are mandated by law to purchase flood insurance.



The 1% annual chance floodplain is divided into different degrees of flood risk: V and Coastal Flood Risk. The maps show the areas that are at risk of flooding.

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 through the reconstruction of storm-damaged buildings 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 public input, will aim to make the text more effective by incorporating lessons learned during the rebuilding process.

Where is the Flood Text Applicable?

The Flood Text is available to buildings located entirely or partially within the 1% 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, 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.

*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.

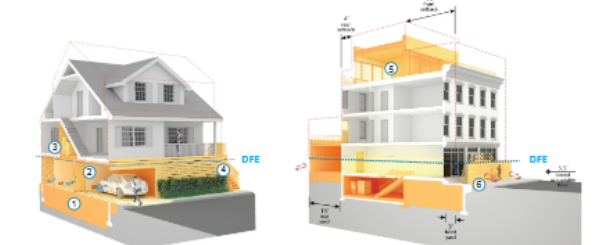
Overview

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 to see more examples in the Retrofitting for Flood Risk report.



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

NYC Planning | November 2016 | Flood Resilient Construction

Zoning for Coastal Flood Resiliency

THANK YOU!

Questions?