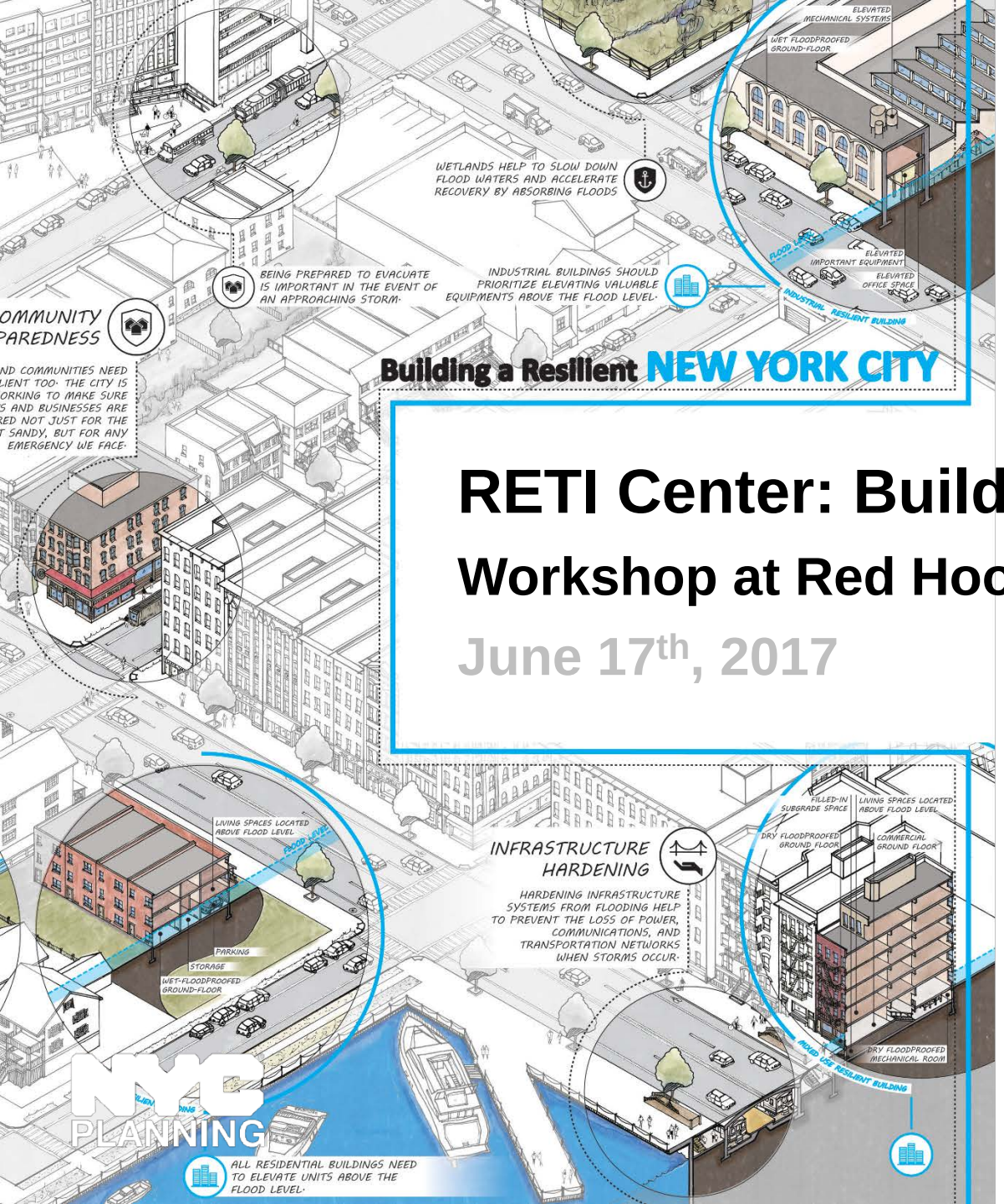


Zoning for Flood Resilience

RETI Center: Building Resilience Day

Workshop at Red Hook

June 17th, 2017

Zoning for Flood Resilience
Workshop Agenda

Agenda:

1. Overview of zoning for flood resilience – 15 min
2. Table Activity about building-scale resilience strategies in Red Hook– 45 min
3. Report Summary of Table Discussions – 15 min

Questions? DCP staff will be available after the activity to answer more specific questions!!!

Zoning for Flood Resilience
Workshop Agenda

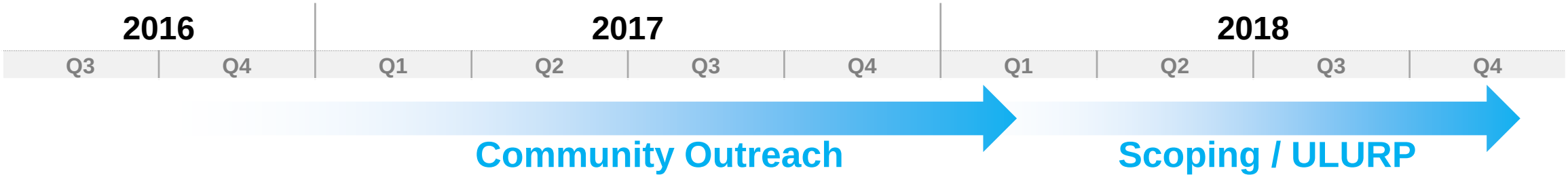
Agenda:

1. **Overview of zoning for flood resilience – 15 min**
2. Table Activity about building-scale resilience strategies in Red Hook– 45 min
3. Report Summary of Table Discussions – 15 min

Questions? DCP staff will be available after the activity to answer more specific questions!!!

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:

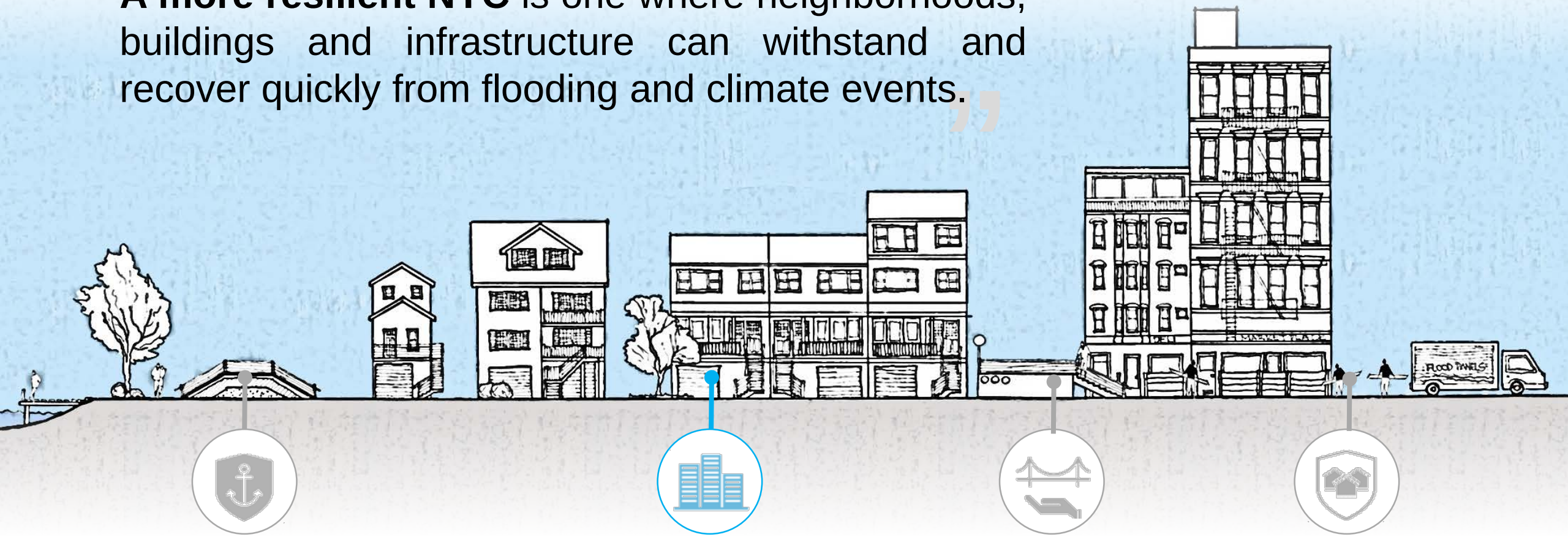
- **Partnering with stakeholders** to educate and promote awareness of flood risk and resiliency issues
- **Explain how zoning tools** relate to resiliency
- **Explore unique neighborhood issues** through in-depth public presentations and workshops
- Develop a proposal through an **iterative process**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

* Schedule is tentative and subject to change

#ONENYC

NYC

"**A more resilient NYC** is one where neighborhoods, buildings and infrastructure can withstand and recover quickly from flooding and climate events."



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

Buildings
are designed to withstand and recover from flooding

Infrastructure
is protected from climate hazards

Residents and businesses
are prepared

Types of Flooding
Citywide Flood Risk

FEMA Flood Map
Citywide Flood Risk

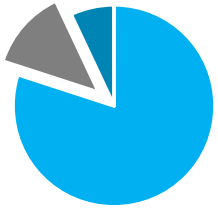
NYC's flood risk is high.

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

100 Year Floodplain
FEMA 2015 PFIRM

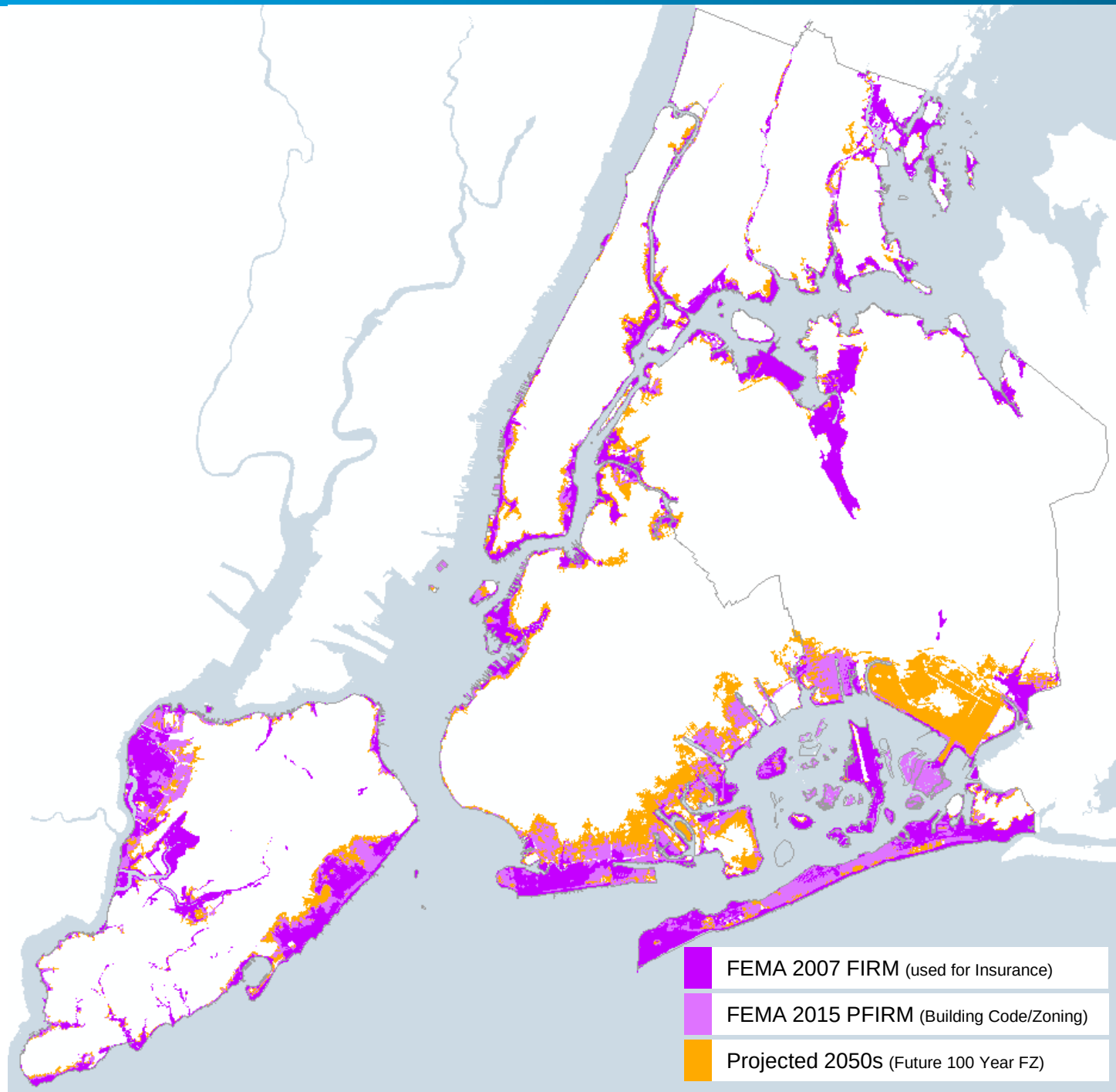
Population: **400,000**
Buildings: **71,500**

50 of 59 Community Boards
45 of 51 Council Districts



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

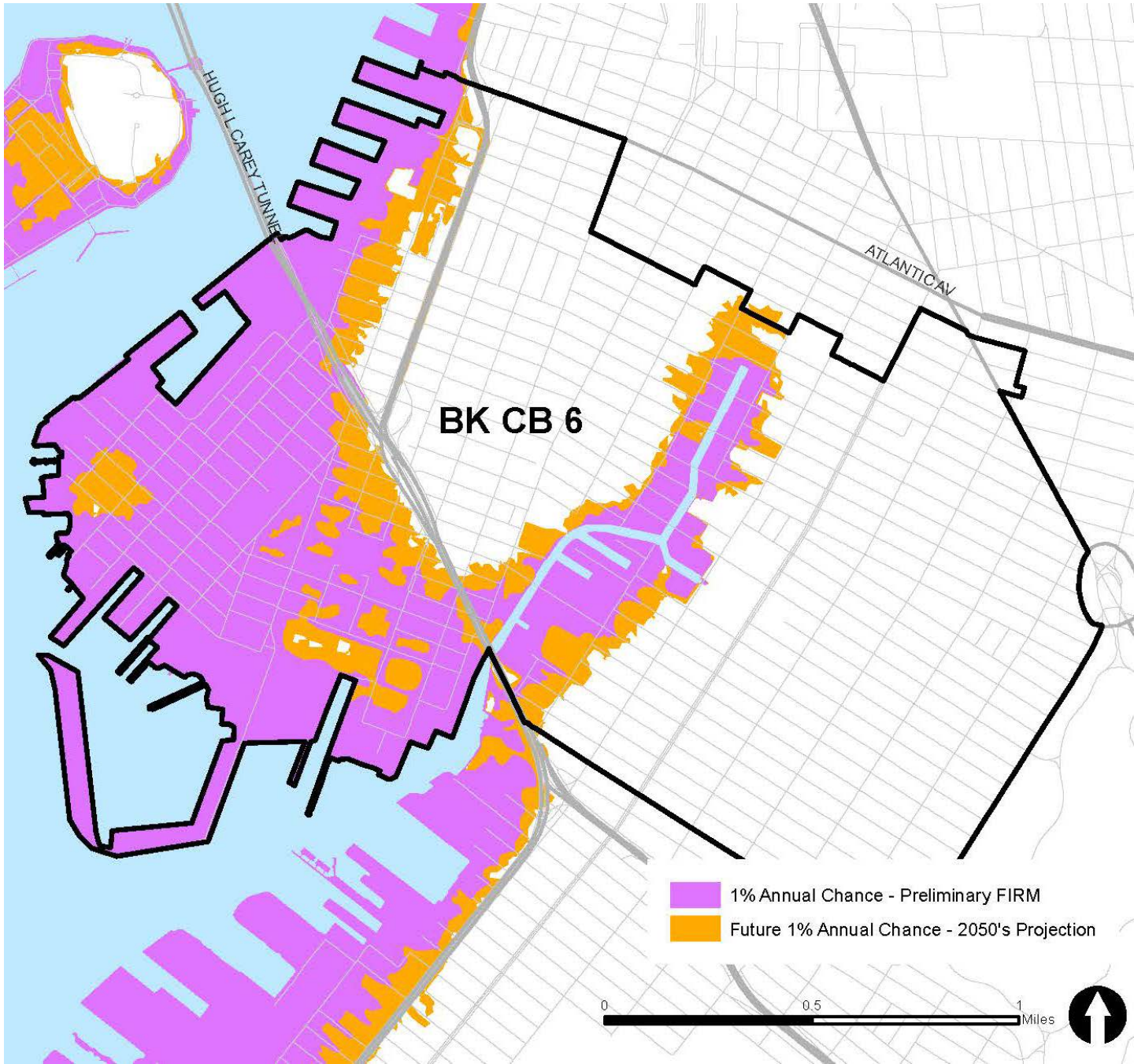
Residential Units:
30% 1-4 units
70% 5+ units



NYC PLANNING

Future Flood Risk
Flood Risk in BK CB 6

	2015 PFIRMS	2050's Projected	
R units in floodplain	6,067	8,856	↑ 46%
Buildings in floodplain	1,308	2,096	↑ 60%



Urban Design Principles

The future of NYC coastal communities:

4

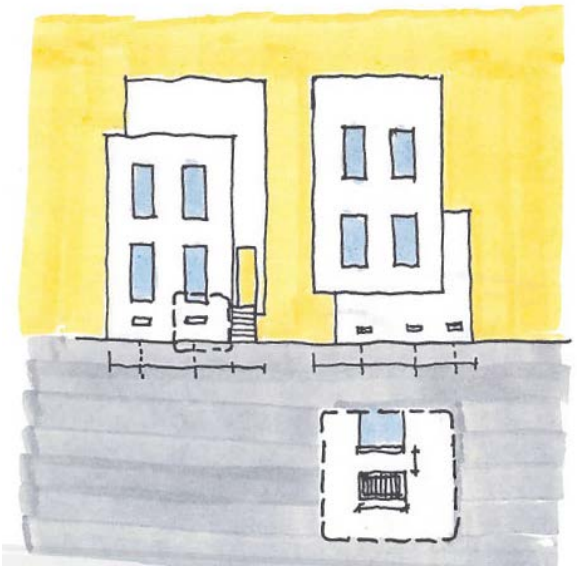
Encourage good resilient construction that enhances the character of coastal communities

PLACE

Preserve Neighborhood Character

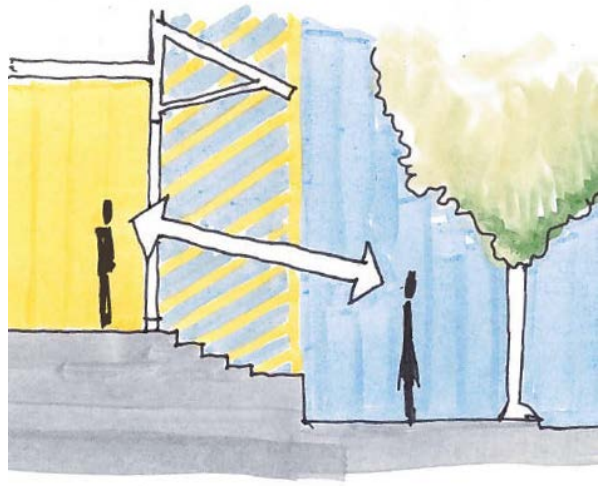
EQUITY

Ensure Inviting Access



DETAIL

Encourage Dynamic and Thoughtful Architecture



COMFORT

Maintain Street Vitality and Safety

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.

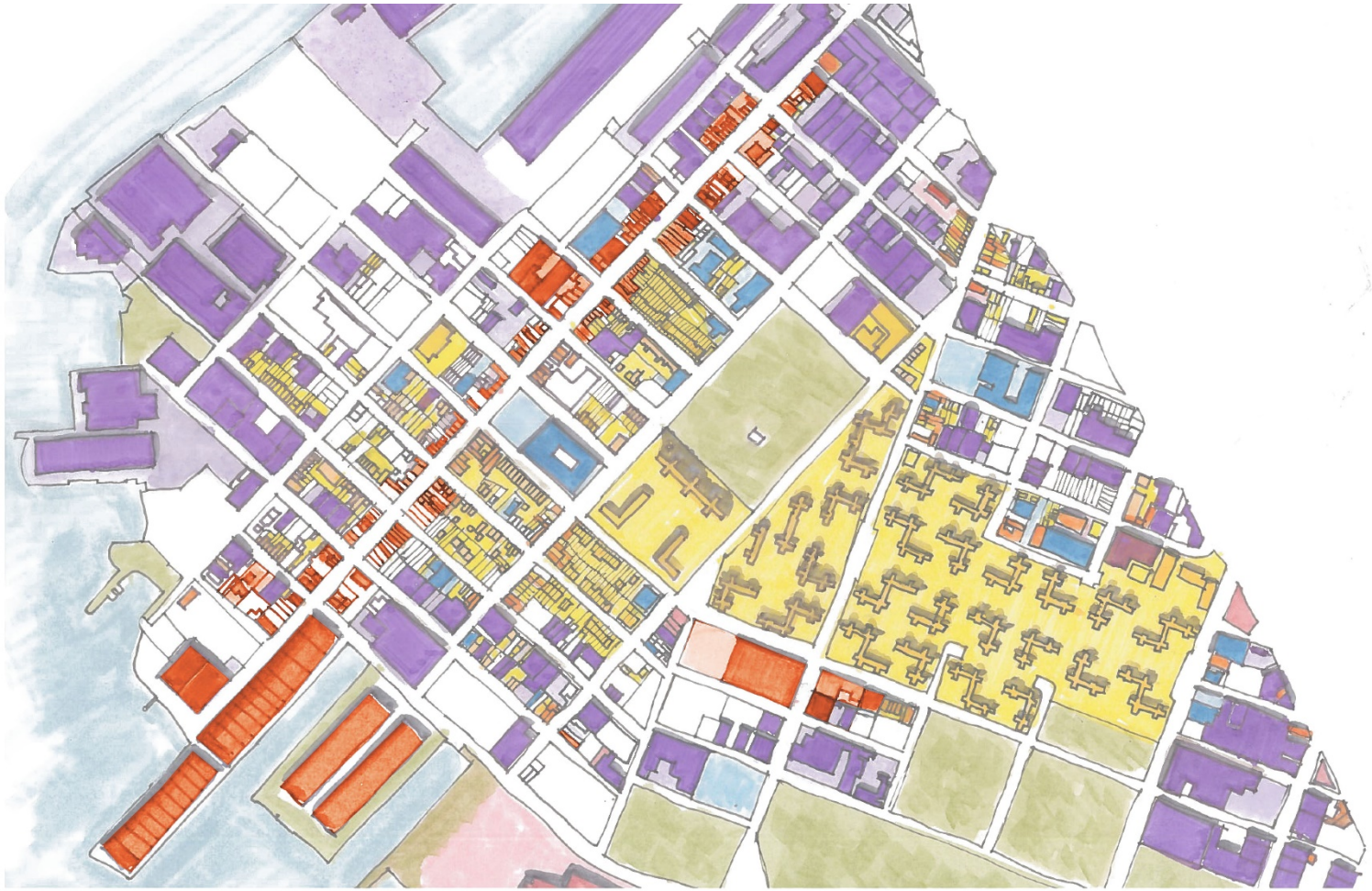
Red Hook Houses–
6 – 14 stories, 3,000 units.

Red Hook, Brooklyn – Neighborhood Character

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

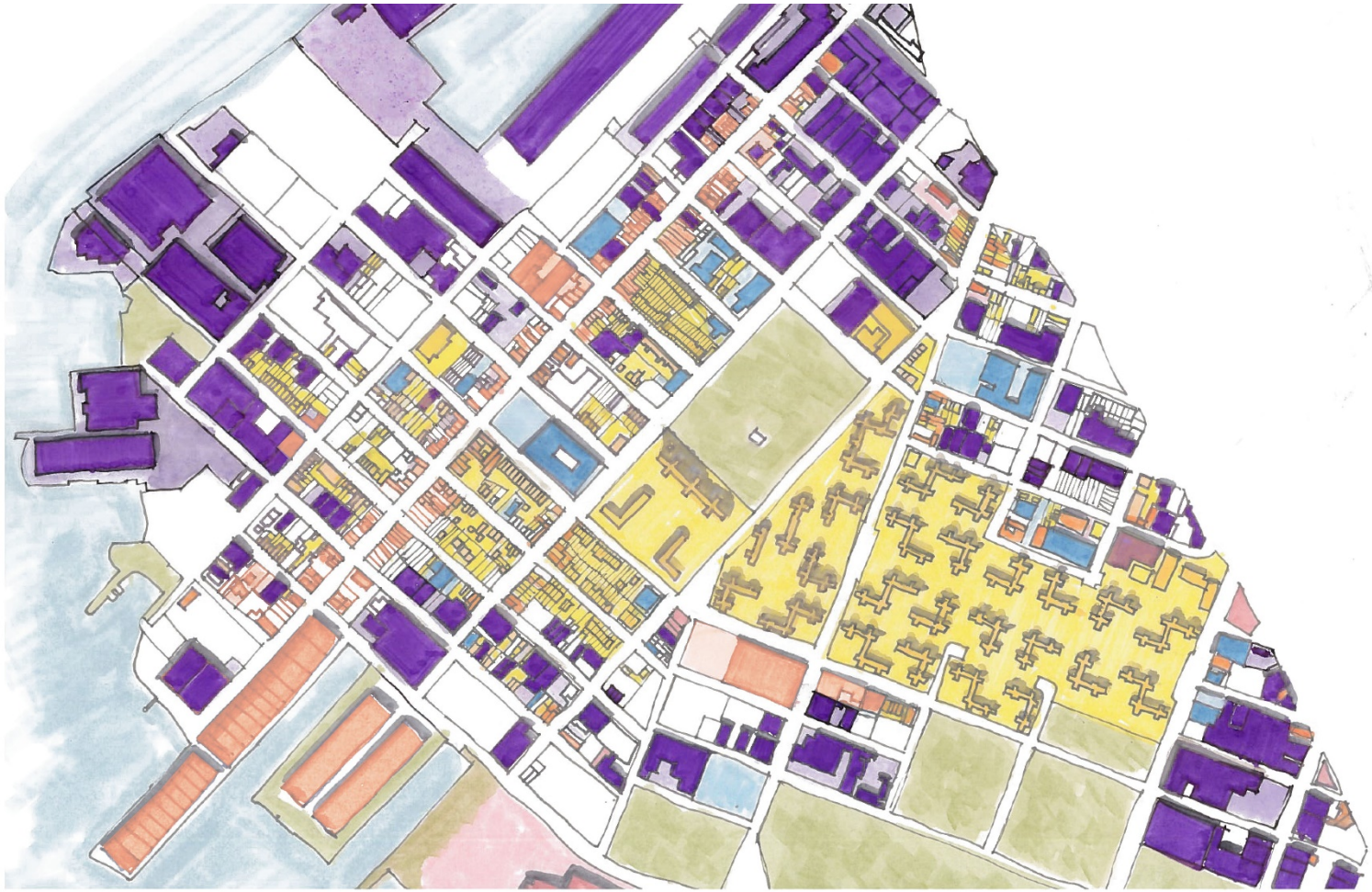
Red Hook, Brooklyn – Neighborhood Character

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



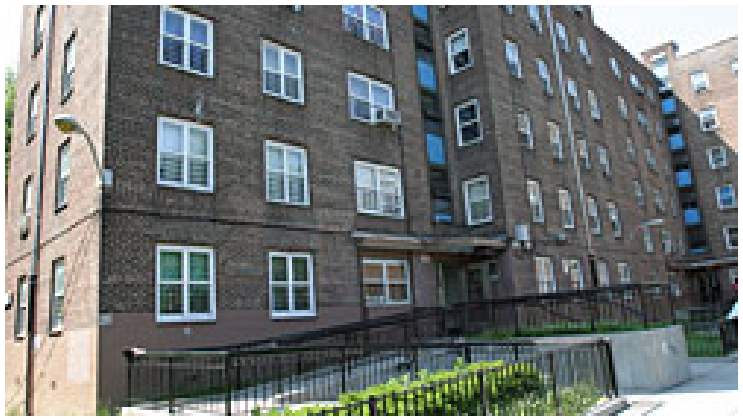
Red Hook, Brooklyn – Neighborhood Character

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

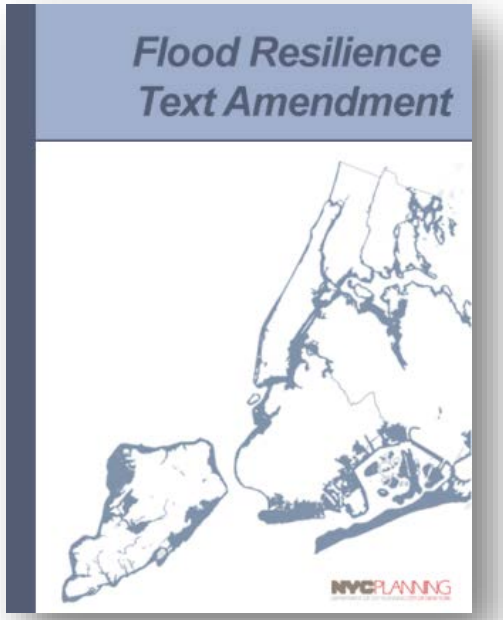


Red Hook, Brooklyn – Neighborhood Character

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



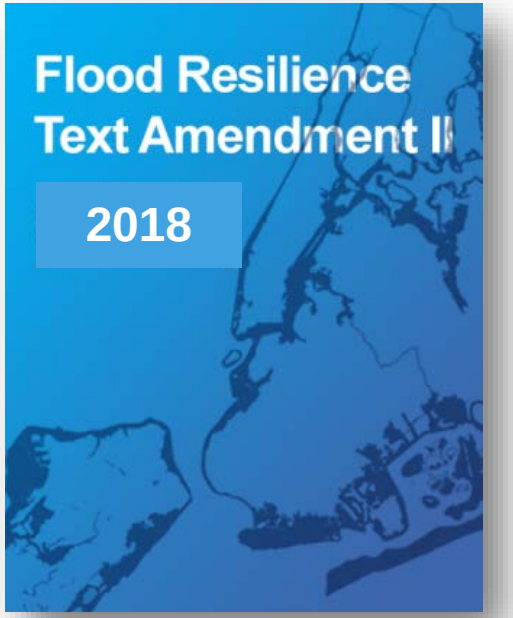
Flood Resilience Zoning
Projects at DCP



2013

“Flood Text”

initial <u>temporary</u> regulations to facilitate recovery



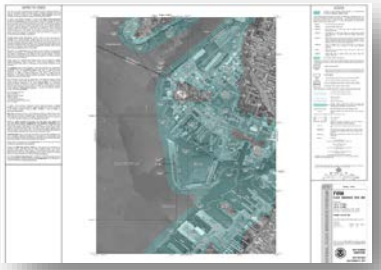
2018

“Flood Text Update”

improve upon, and make permanent, the Flood Text

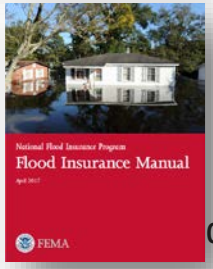
How are buildings in the floodplain regulated?

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

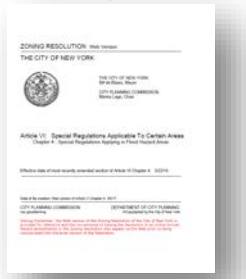
Construction Standards (ASCE 24)

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

NYC PLANNING

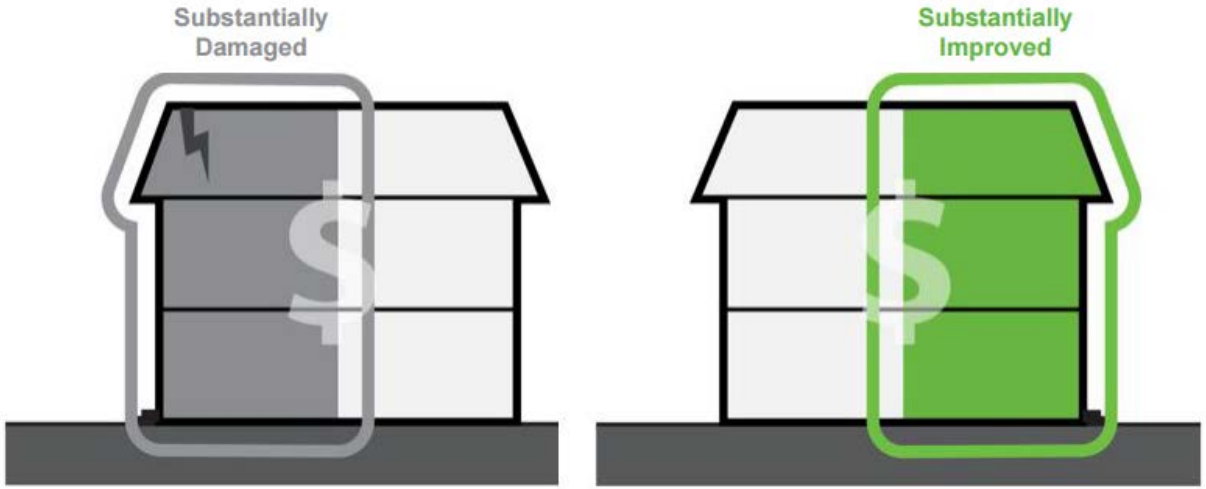
Flood resilient construction
Required by DOB

Building Code (DOB)

Requires new buildings and substantial improvements to meet FEMA standards

Required
for all new buildings

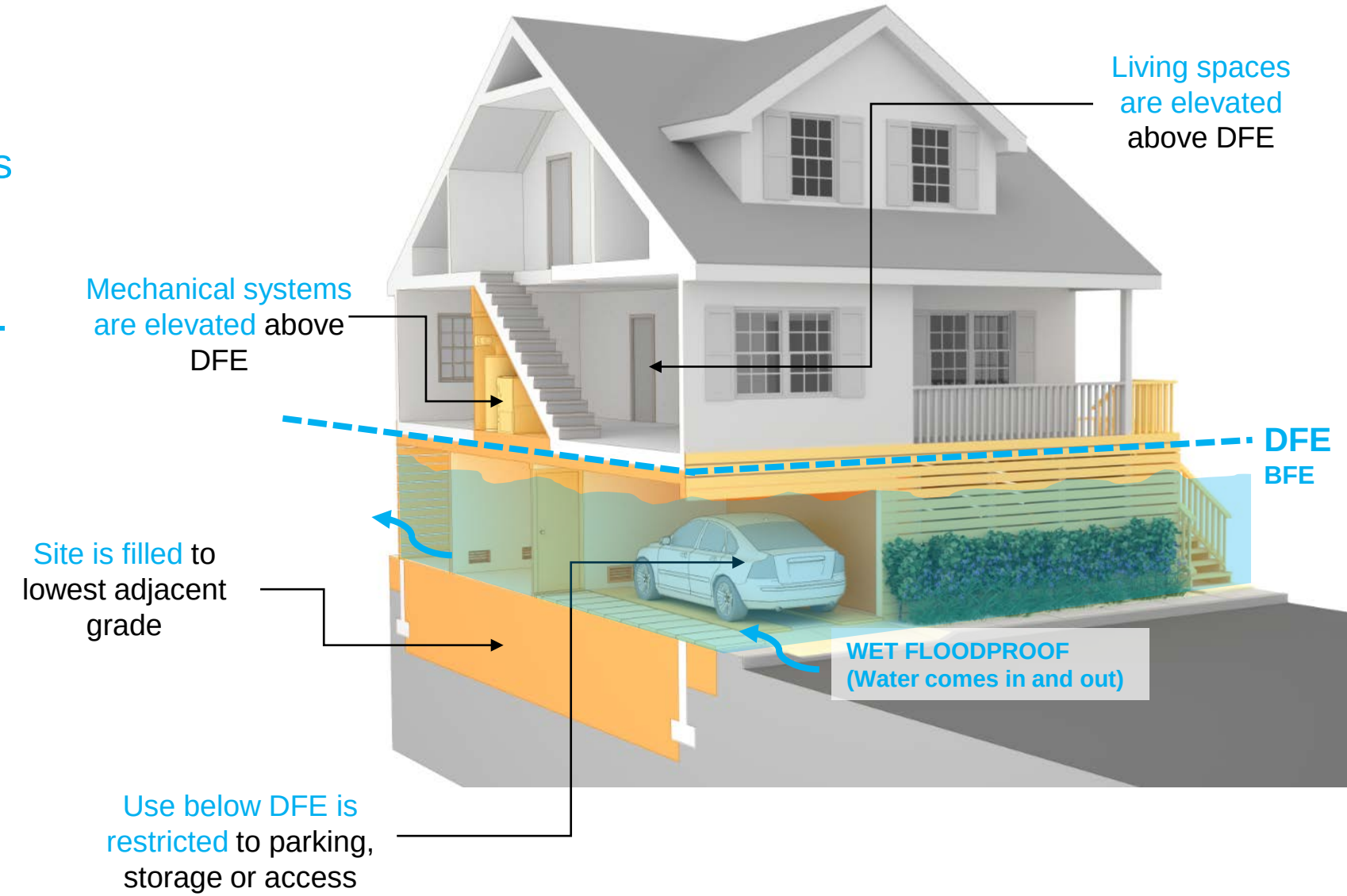
Not required for existing buildings
(unless substantially damaged or improved)



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).



Flood resilient construction
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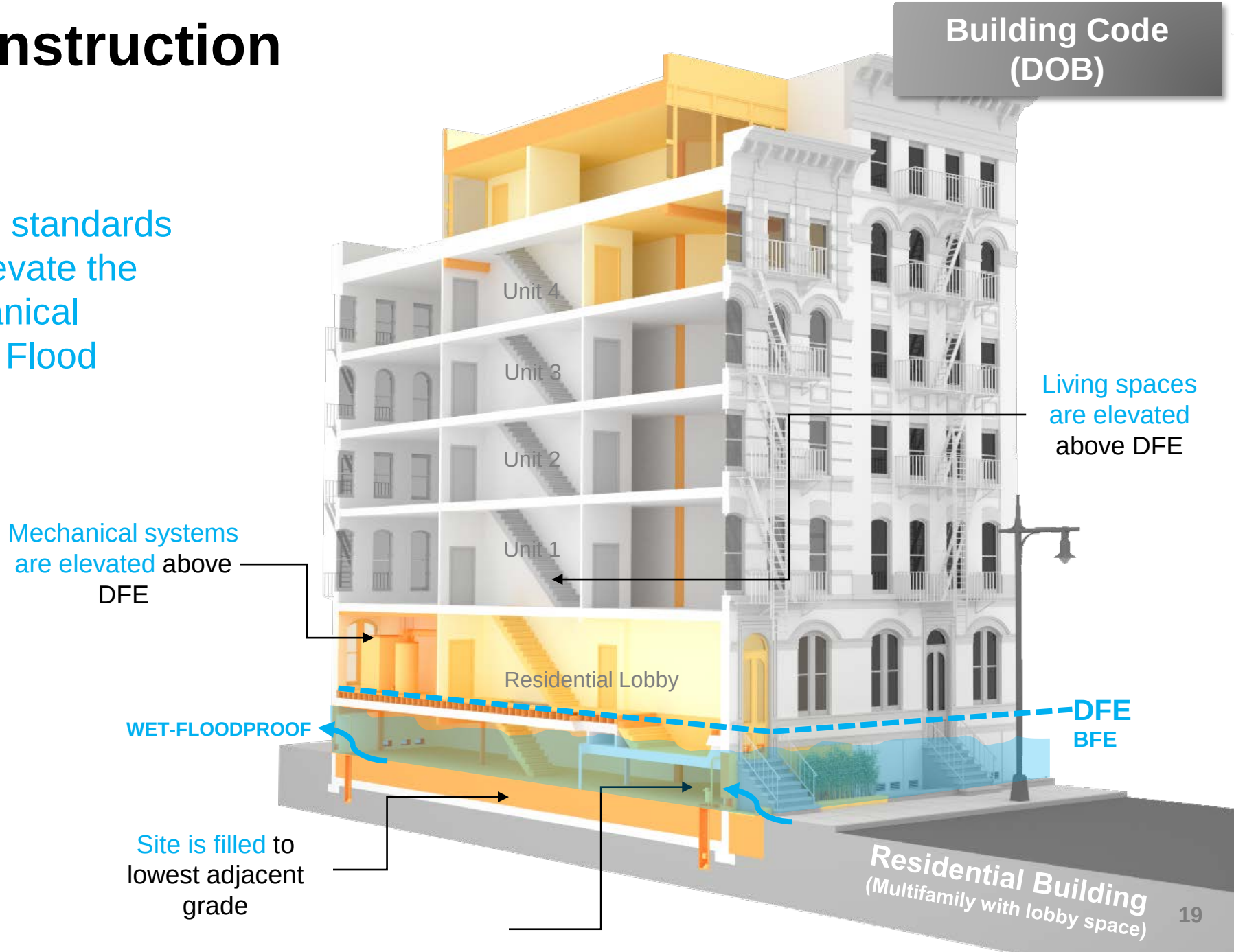


Flood resilient construction
Examples of Residential Buildings

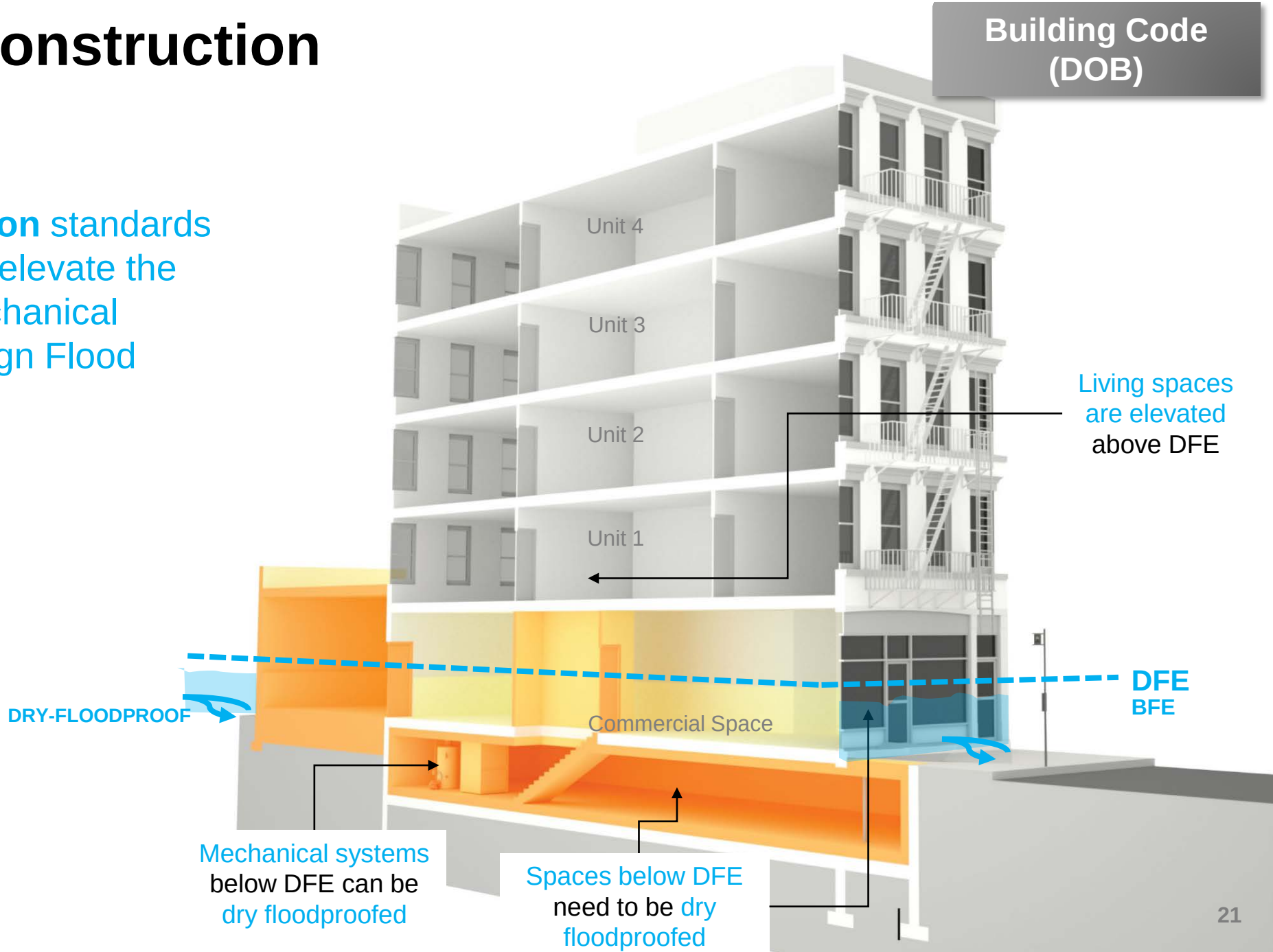
Building Code (DOB)

Residential Building
with access at grade (wet-floodproofed)

Residential Building
Elevated to DFE – 3’ above grade

Flood resilient 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).



Flood resilient construction
Examples of Commercial Buildings

Building Code (DOB)

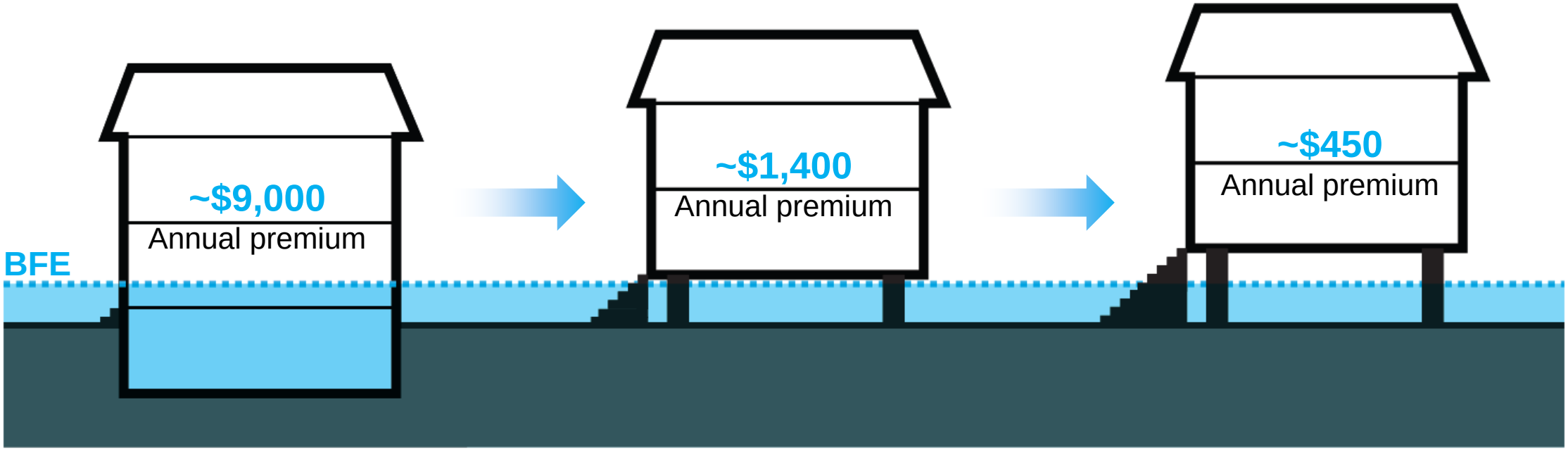
Commercial Ground Floor
Existing Building with access at grade (deployable flood shields)

Commercial Ground Floor
Elevated to DFE – 2.5’

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).**



4 FEET OR MORE
BELOW BFE

AT
BFE

3 FEET OR MORE
ABOVE BFE

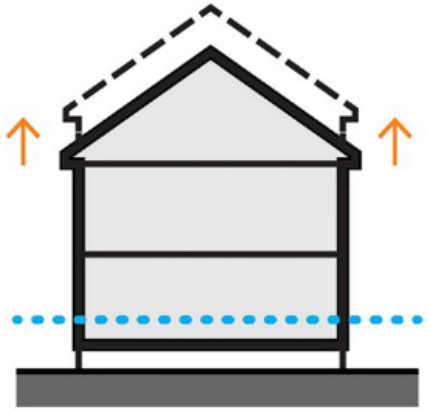
2013 Citywide Flood Text

Amended zoning in six key areas

Zoning Resolution (DCP)

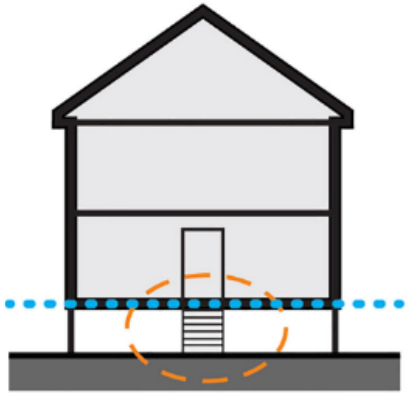
1 Height

Measured from flood elevation



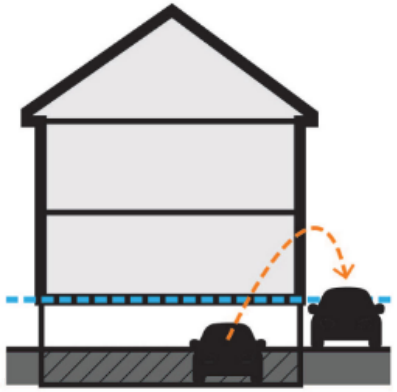
2 Access

Flexibility for stairs, ramps, lifts



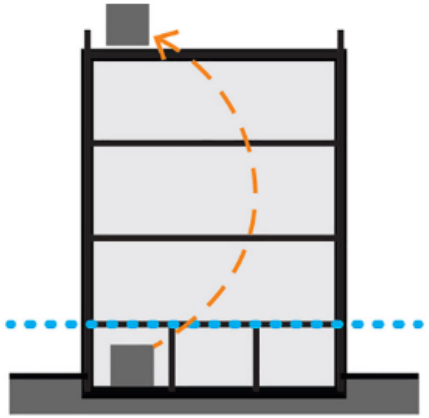
3 Parking

Flexibility to relocate parking



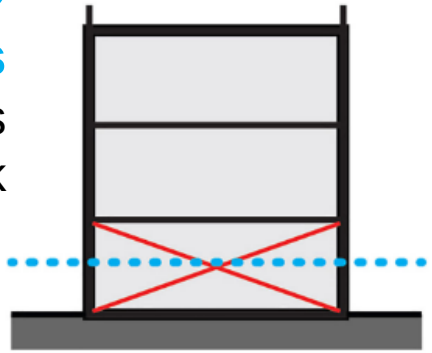
4 Systems

Flexibility to relocate/elevate



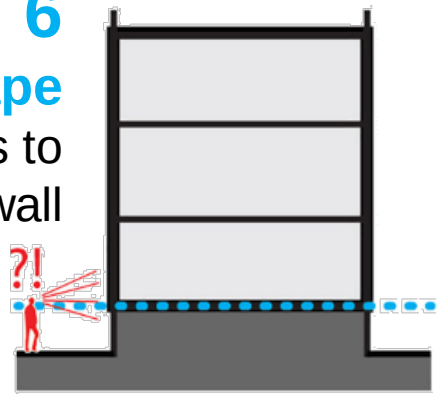
5 Ground Floors

Account for costs of new flood risk



6 Streetscape

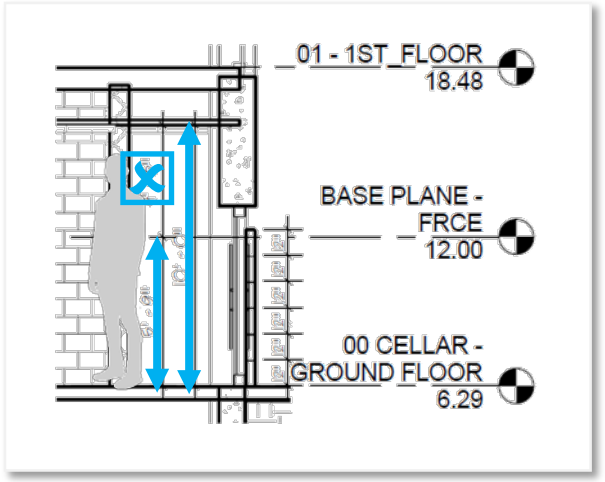
Require features to mitigate blank wall

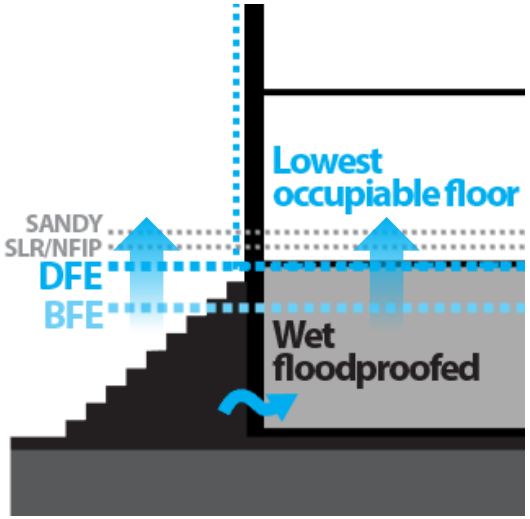


Flood Text II

Need for a new citywide text amendment:

Zoning Resolution (DCP)





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

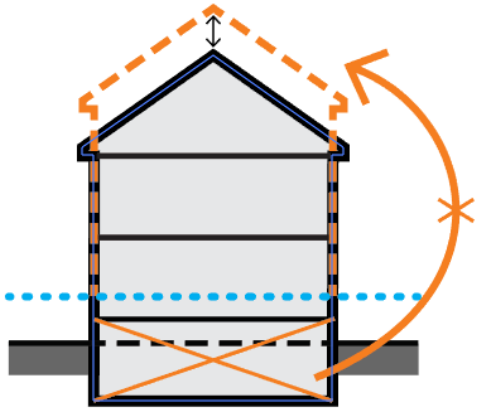
Flood Text II

Fix and improve provisions based on lessons learned

Zoning Resolution (DCP)

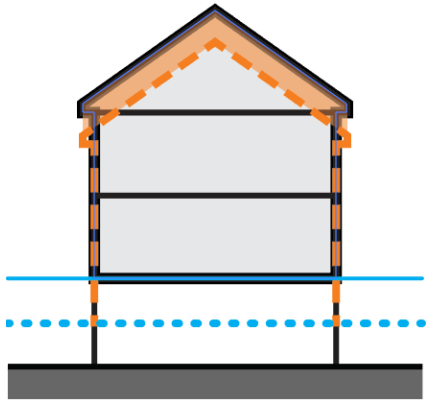
1 Height

Homeowners may face the loss of subgrade spaces when retrofitting



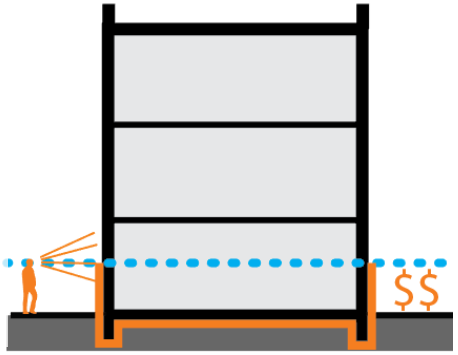
2 Height

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



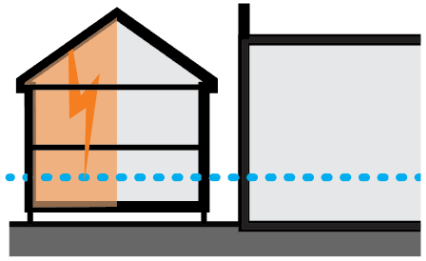
3 Ground Floors

Current incentives to keep active ground floors may not be enough



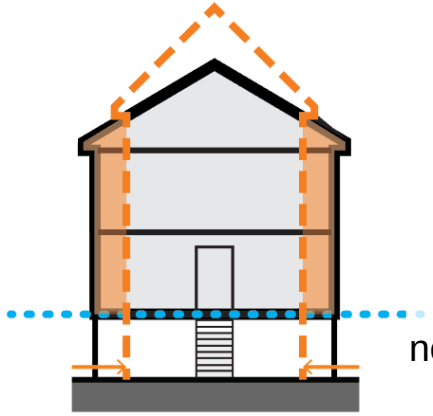
4 Homes in M Districts

Existing homes in M. Districts, if damaged, may not be able to rebuild



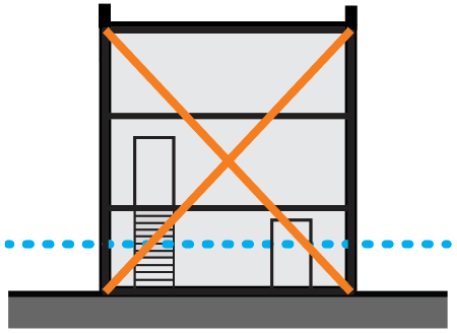
5 Old Homes in Small Lots

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



Outreach Resources

NYC Flood Hazard Mapper

www.nyc.gov/floodhazardmapper

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

www.nyc.gov/resilientneighborhoods

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 d to your most valuable asset: you business.
- Even properties far from the coa risk of flooding.
- Homeowner and property insura cover damage by flooding. You n separate policy.
- Federal assistance is not guaran event of a flood.
- Many property owners are requi federal law to purchase and m insurance if the property is locat risk flood zone of the 2007 FIRM to right), has a federally backed has received federal disaster ass

How Much Flood Insura Must a Homeowner Pur

Properties with a federally backed in a high-risk flood zone and thos received federal disaster assistan maintain flood insurance up to the N limits, or the outstanding mortgage b whichever is lower. Failure to do so mortgage servicers to purchase a po property—possibly at a higher price- on the cost through monthly mortgag

Homeowners without a federally-b mortgage or outside a high flood carry up to the maximum policy limit with additional contents coverage av $100,000 for owners or renters. Co- multifamily buildings and business p be covered up to $500,000. Busines and tenants can also purchase up to contents coverage.

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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.

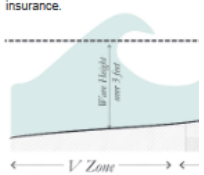
Flood Risks

Hurricanes, tropical storms, nor'e intense rain storms, and even ext tides are the primary causes of fl NYC.

For building code, zoning, and pl purposes, flood risk in NYC is rep on FEMA's 2015 Preliminary Floo Rate Maps (PFIRMs).

- PFIRMs show the extent to whic waters are expected to rise duri event that has a 1% annual cha occurring. This height is denotec Flood Elevation (BFE) on the ma
- The 1% annual chance floodpla sometimes referred to as the 10 floodplain. However, this term is since these floods can occur mu within 100 years. In the 1% annu floodplain, there is a 26% chanc over the life of a 30-year mortga

For flood insurance purposes, rel 2007 Flood Insurance Rate Maps property owners of buildings in the 1 chance floodplain with a federally in mortgage are mandated by law to p insurance.



The 1% annual chance floodplain is divided different degree of flood risk. V and Coastal flooding but not wave damage. The maps al which has a lower annual chance of flooding

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Flood Resilience Zoning
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.

Overview

The Flood Text enables and encou resilient building construction thr designated floodplains.

The Flood Text modified zoning to re regulatory barriers that hindered or p the reconstruction of storm-damaged by enabling new and existing buildin with new, higher flood elevations issu the Federal Emergency Managemen (FEMA), and to comply with new req the New York City Building Code.

It also introduced regulations to mitig negative effects of flood resilient con the public realm. The text was adopt on a temporary, emergency basis. Th future update of this text, guided by input, will aim to make the text perma incorporate lessons learned during th and rebuilding 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 utiliz require the building to fully comply w resilient construction standards foun G of the New York City Building Cod some provisions, such as elevation c spaces, are available to all buildings the floodplain, even if not fully compl Appendix G.

For more information about the Floo www.nyc.gov/resilientneighborho

*Per the more restrictive of the 2007 FIRMs PFIRMs.

NYC Planning | March 2017 | Fl

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.

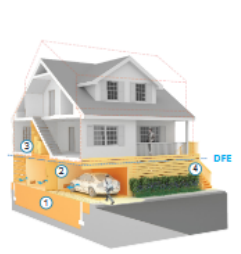
Overview

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.



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

NYC PLANNING

For more information, and to stay involved, email

resilientneighborhoods@planning.nyc.gov

Zoning for Flood Resilience
Workshop Agenda

Agenda:

1. Overview of zoning for flood resilience – 15 min
2. **Table Activity about building-scale resilience strategies in Red Hook– 45 min**
3. Report Summary of Table Discussions – 15 min

Questions? DCP staff will be available after the activity to answer questions!!!

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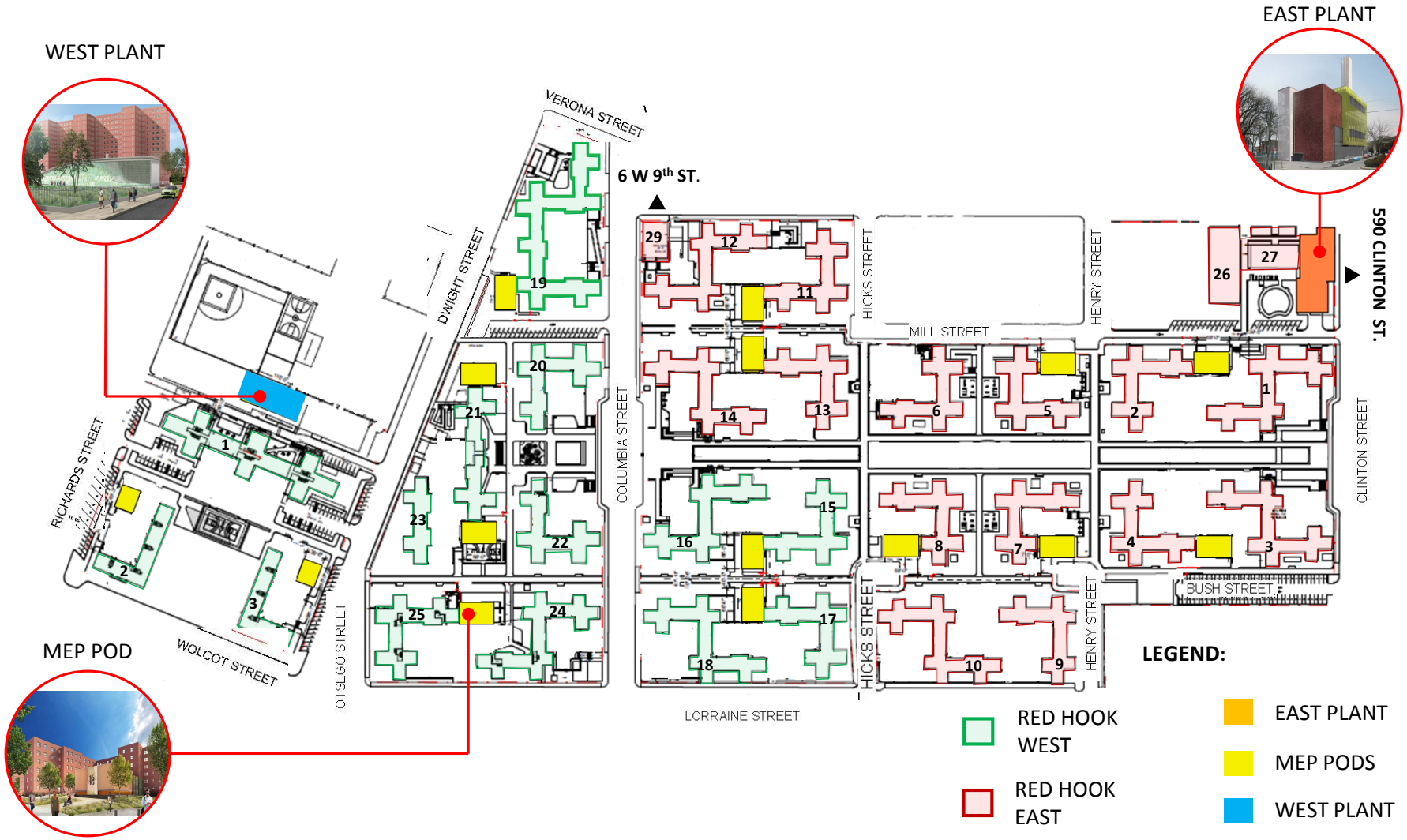
Red Hook Houses – Site Plan



RECOVERY TO RESILIENCY
NYCHA'S SUPERSTORM SANDY RECOVERY PROGRAM

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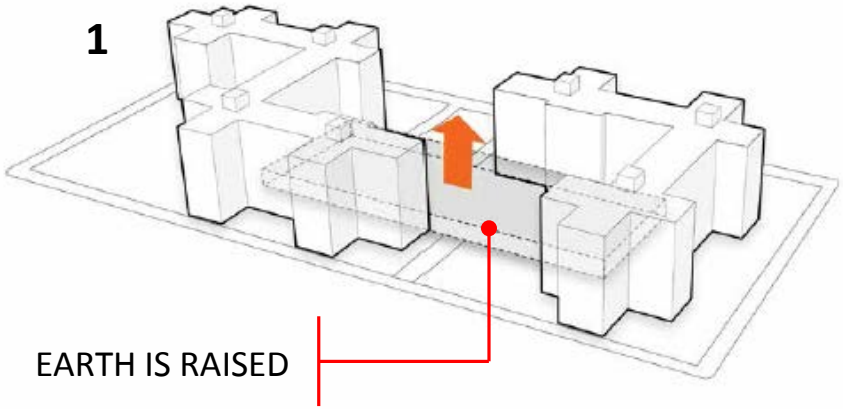
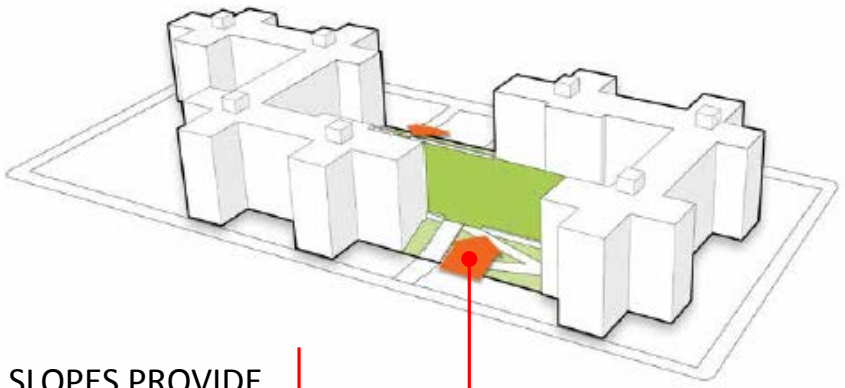
Red Hook Houses – Flood Protection

1



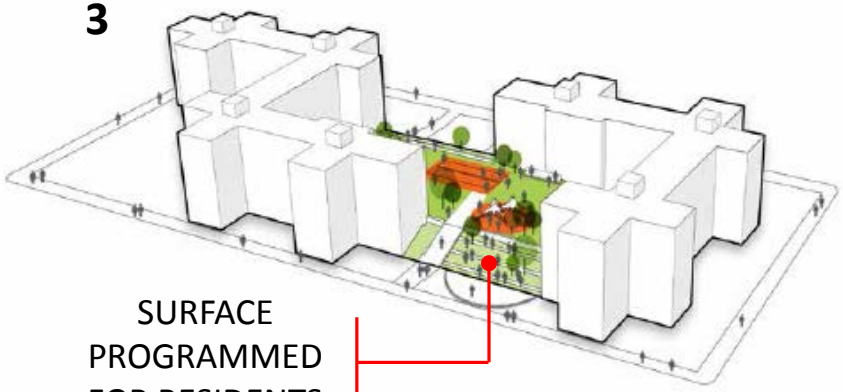
EARTH IS RAISED

2



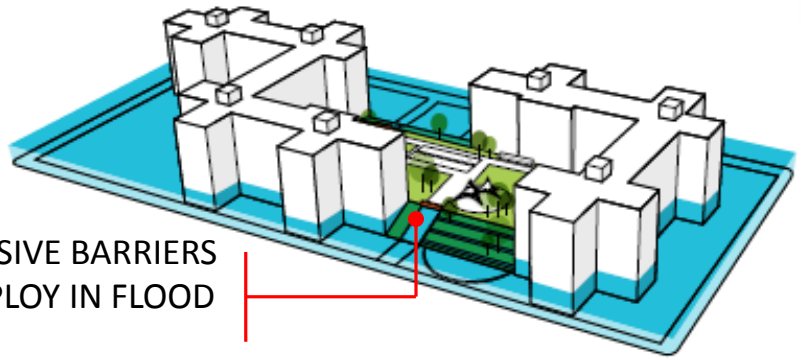
SLOPES PROVIDE EASY ACCESS

3



SURFACE PROGRAMMED FOR RESIDENTS

4



PASSIVE BARRIERS DEPLOY IN FLOOD

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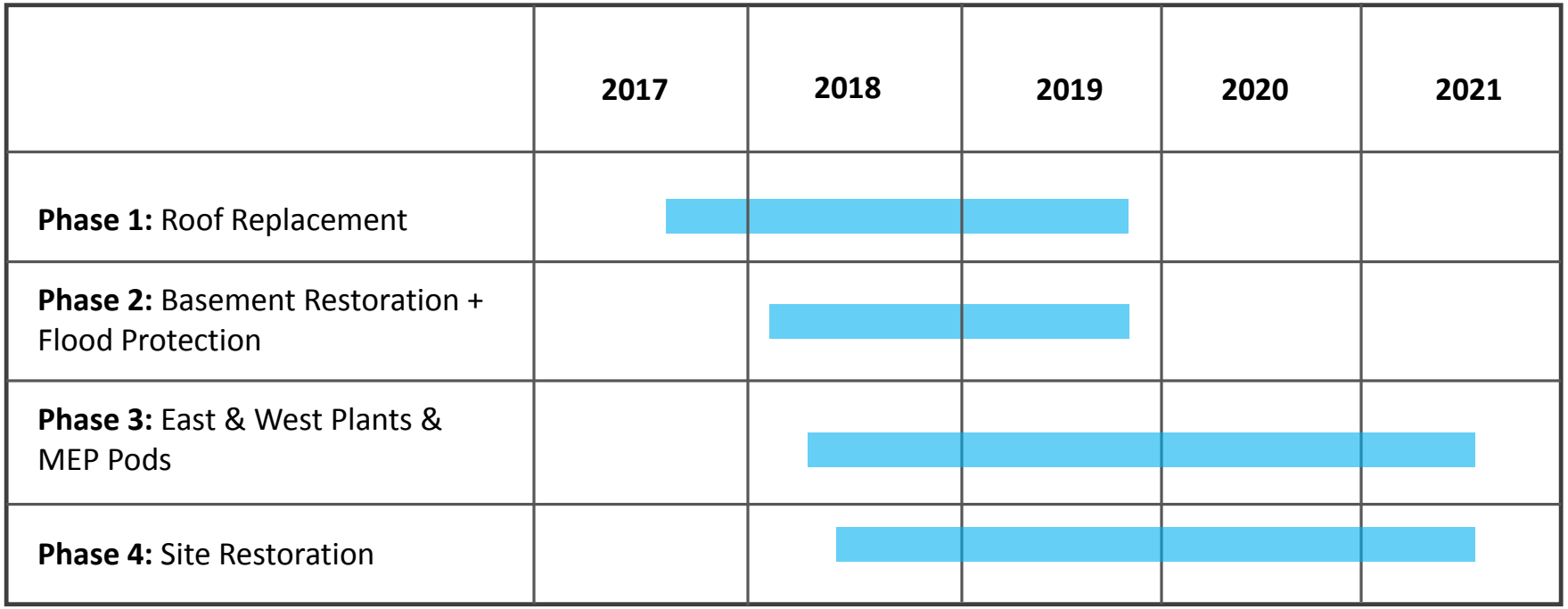
Red Hook Houses – Construction Timeline

	2017	2018	2019	2020	2021
Phase 1: Roof Replacement					
Phase 2: Basement Restoration + Flood Protection					
Phase 3: East & West Plants & MEP Pods					
Phase 4: Site Restoration					



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