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

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

DCP plans a robust public engagement process:

- Community Outreach
- Scoping / ULURP

2016 2017 2018

* Schedule is tentative and subject to change
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

Inland Flooding

Coastal Flooding

Riverine Flooding

FLOOD TYPES
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

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

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

---

FEMA Flood Map
Citywide Flood Risk

Citywide Flood Risk
Projected 2050s (Future 100 Year FZ)

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

<table>
<thead>
<tr>
<th></th>
<th>2015 PFIRMS</th>
<th>2050’s Projected</th>
<th>Increase</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>R units in floodplain</td>
<td>6,067</td>
<td>8,856</td>
<td></td>
<td>46%</td>
</tr>
<tr>
<td>Buildings in floodplain</td>
<td>1,308</td>
<td>2,096</td>
<td></td>
<td>60%</td>
</tr>
</tbody>
</table>
Urban Design Principles
The future of NYC coastal communities:

PLACE
Preserve Neighborhood Character

EQUITY
Ensure Inviting Access

DETAIL
Encourage Dynamic and Thoughtful Architecture

COMFORT
Maintain Street Vitality and Safety

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

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

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

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

Red Hook Houses—
6 – 14 stories, 3,000 units.
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 temporary regulations to facilitate recovery

2018
“Flood Text Update”
improve upon, and make permanent, the Flood Text
How are buildings in the floodplain regulated?

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

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

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

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

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

Required for all **new** buildings

Not required for **existing** buildings
(unless substantially damaged or improved)
Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE). Use below DFE is restricted to parking, storage or access.

Site is filled to lowest adjacent grade

Mechanical systems are elevated above DFE

Living spaces are elevated above DFE

WET FLOODPROOF (Water comes in and out)
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 Residential Buildings

Residential Building
with access at grade (wet-floodproofed)

Residential Building
Elevated to DFE – 3’ above grade
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

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**: ~$9,000 Annual premium
- **AT BFE**: ~$1,400 Annual premium
- **3 FEET OR MORE ABOVE BFE**: ~$450 Annual premium
2013 Citywide Flood Text
Amended zoning in six key areas

1. Height
   Measured from flood elevation

2. Access
   Flexibility for stairs, ramps, lifts

3. Parking
   Flexibility to relocate parking

4. Systems
   Flexibility to relocate/elevate

5. Ground Floors
   Account for costs of new flood risk

6. Streetscape
   Require features to mitigate blank wall

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

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

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

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

4. Encourage good resilient construction that enhances the character of coastal communities
Fix and improve provisions based on lessons learned

1. **Height**
   - Homeowners may face the loss of subgrade spaces when retrofitting.

2. **Height**
   - Property owners may want to address future risk by over-elevating.

3. **Ground Floors**
   - Current incentives to keep active ground floors may not be enough.

4. **Homes in M Districts**
   - Existing homes in M Districts, if damaged, may not be able to rebuild.

5. **Old Homes in Small Lots**
   - Old homes on small lots may need more flexibility to rebuild in the future.

6. **Improve Streetscape**
   - Mitigate the effects of elevated buildings on neighborhood character.
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
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!!!
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!!!
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

Office of Recovery and Resiliency
212.306.8532
Disaster.recovery@nychaparkgov
## Red Hook Houses – Construction Timeline

![Table showing the construction timeline for Red Hook Houses](table.png)

<table>
<thead>
<tr>
<th>Phase</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1:</strong> Roof Replacement</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2:</strong> Basement Restoration + Flood Protection</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 3:</strong> East &amp; West Plants &amp; MEP Pods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Phase 4:</strong> Site Restoration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Office of Recovery and Resiliency
212.306.8532
Disaster.recovery@nycha.nyc.gov