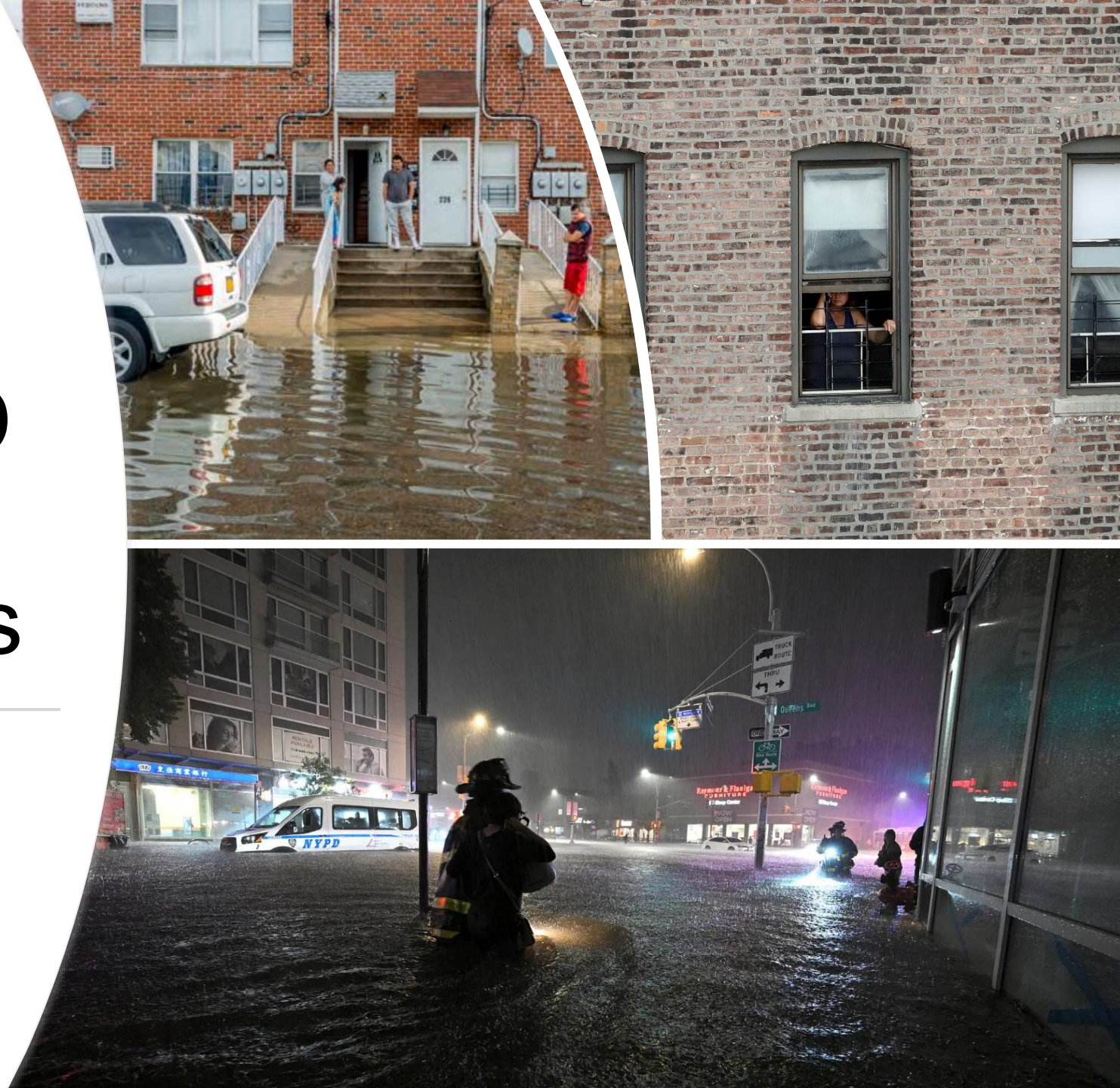


Resiliency in HPD New Construction Design Guidelines

October 15th, 2024



Introduction

Allan Zaretsky, AICP Director, Resiliency Planning and Policy

zaretska@hpd.nyc.gov

Michael Nicholas Senior Planner, Resiliency Planning and Policy

nicholasm@hpd.nyc.gov

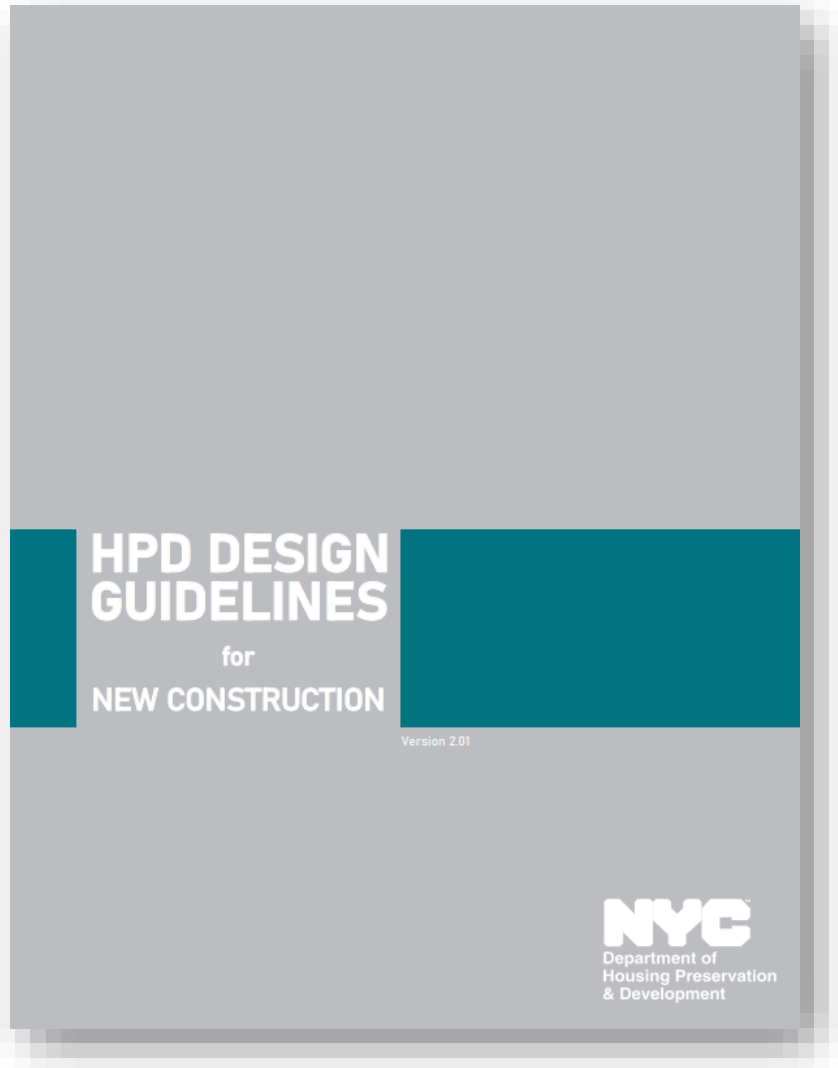
Please introduce yourself and share your affiliation in the chat!

Agenda

- HPD Design Guidelines for New Construction
- Resiliency Design Review & waiver process
- Climate Resiliency Requirements
 - Flood Resilient Construction (Section 2.1)
 - Stormwater Management (2.2)
 - Extreme Heat (2.3)
 - Passive Survivability (2.4)
- Overview of Screening Tools
- Q&A

Key Climate Resiliency Documents

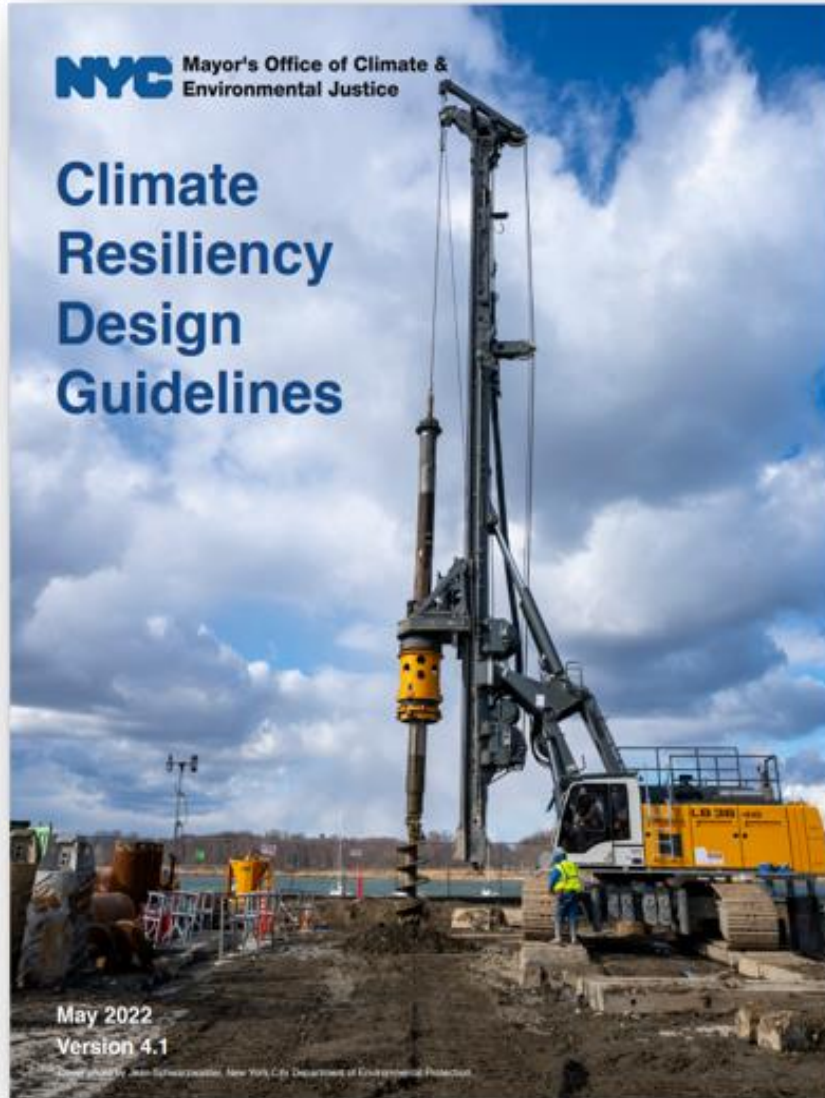
Design Guidelines for New Construction



- **HPD's Design Guidelines for New Construction** establish the building design criteria by which HPD's Division of Building and Land Development Services (BLDS) evaluates proposed developments for multifamily new construction, supportive, and senior housing projects.
- Projects must comply with HPD's Design Guidelines and design acceptance by BLDS is a prerequisite to loan closing for any new construction project developed under applicable HPD loan programs.
- Version 2.0, released in September 2023 incorporates **new resiliency design requirements** based on forward-looking climate change projections into HPD's design standards.
 - **HPD's resiliency requirements are based on **Climate Resiliency Design Guidelines (CRDG)** design standards and other best practices.**

Key Climate Resiliency Documents

Climate Resiliency Design Guidelines

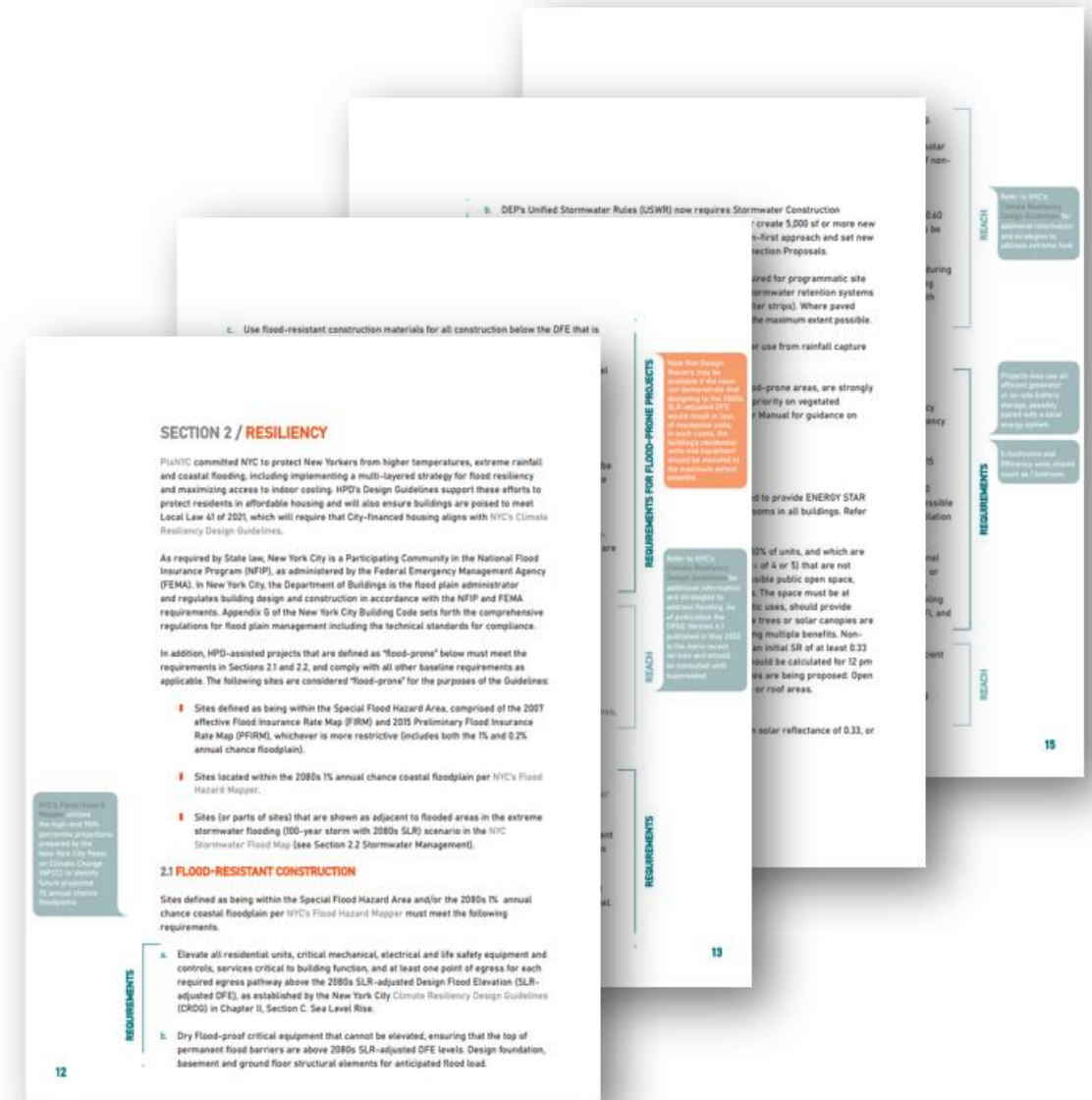


- The **NYC Climate Resiliency Design Guidelines** were developed to provide step-by-step instructions on designing facilities and infrastructure that incorporate forward-looking climate change data on **heat, precipitation, and sea level rise**.
- Used throughout the design process—during project scoping and planning initiation, as a reference in requests for proposals (RFPs), during the preliminary design or study phase, through to final design—for **all new construction and substantial improvements of City facilities**.
- Under the CRDG, buildings are required to be built to projected resiliency standards **through their full useful life**.
- Per LL 41 (2021) by 2027, City capital projects – including most projects financed by HPD - must meet a stringent set of requirements that will certify their preparedness for extreme weather threats.

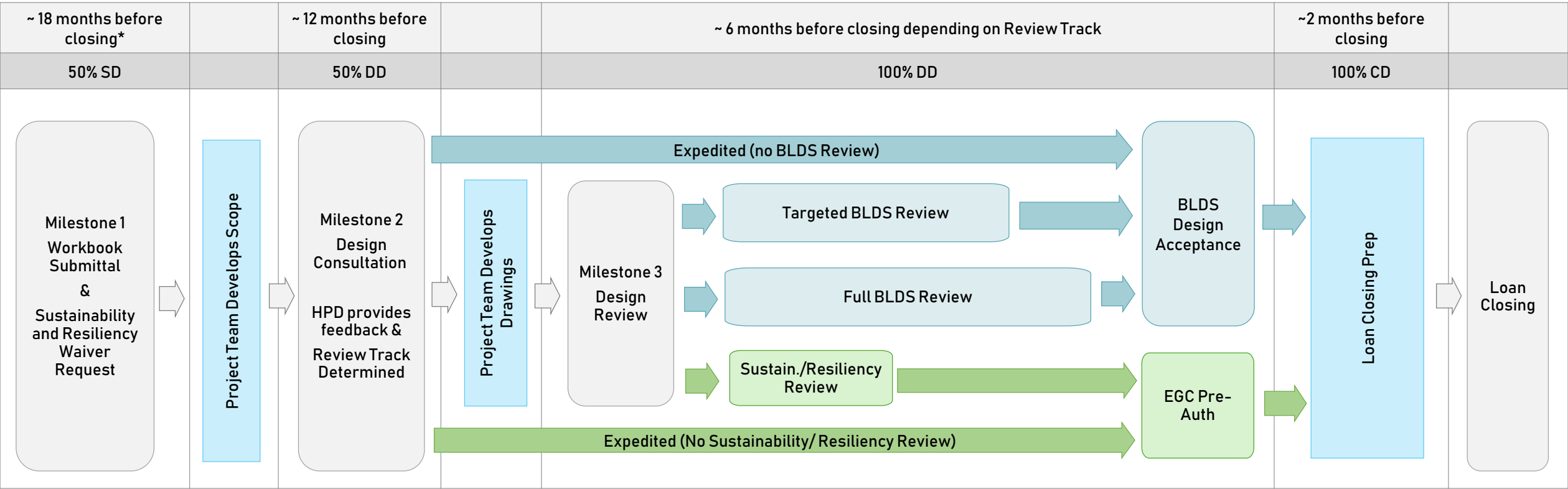
New Climate Resiliency Requirements and Guidelines

- Resiliency requirements fall within **Chapter 2, Section 2** of the Design Guidelines
 - 2.1 Flood Resistant Construction
 - 2.2 Stormwater Management
 - 2.3 Extreme Heat*
 - 2.4 Backup Power and Passive Survivability*
- Compliance with the Resiliency requirements is necessary to receive BLDS Design approval and for **Enterprise Green Communities (EGC)** Pre-authorization
- **Design Waivers** are considered for certain mandatory criteria and must be requested early in the process to avoid issues.

* **HPD's Resiliency** and **Sustainability** teams work together throughout project review to ensure that projects are both resilient to climate risks and align with the Agency's sustainability goals.



BLDS Design Review Process



*This is a draft, provisional schedule and timeframes provided here are estimates.

Legend

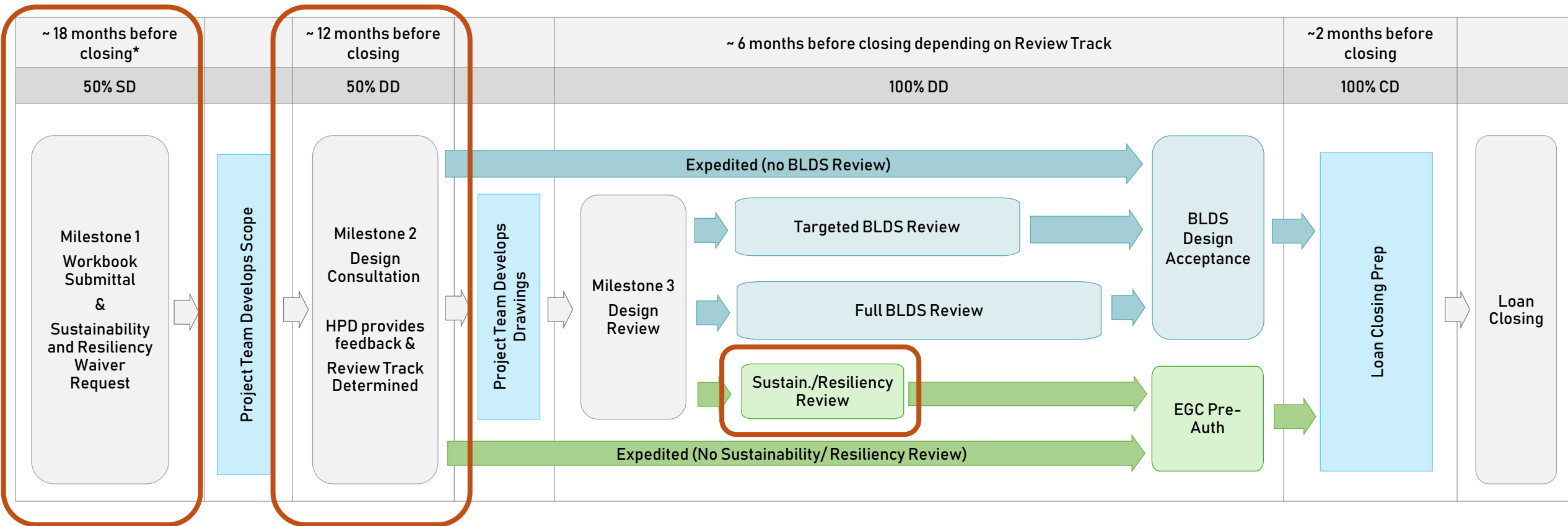
Milestones

Project Team

HPD BLDS

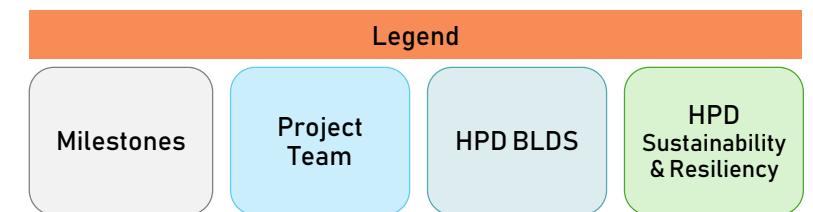
HPD Sustainability & Resiliency

BLDS Design Review Process



Important checkpoints for **Resiliency** review

*This is a draft, provisional schedule and timeframes provided here are estimates.



HPD Design Review Process

Milestone 1 Submission

- **Timing:** Around 18 months before closing, before Design Drawings initiated
- **Goals of Milestone 1 Submission:**
 - Initial Workbook submittal with basic project information
 - Determine which **resiliency and sustainability requirements** apply to your project
 - Determine if **waivers** for any requirements are necessary

Review the detailed
New Construction
Design Guidelines
Process.

New Construction
Design Guidelines
Workbook



HPD Design Review Process

Design Consultation

- **Timing:** Around 12 months before closing, 50% Design Drawings.
- **Goals of the Design Consultation:**
 - Discuss compliance with design guidelines, accessibility, solar, electrification, **flood and heat risk**, etc.
 - Address any questions or concerns the development team may have
 - Establish review track and determine need for **Sustainability/Resiliency Review**

Review the detailed
New Construction
Design Guidelines
Process.

Design Consultation
Submission Checklist



HPD Design Review Process

Post-Design Consultation Resiliency/Sustainability Review

- **Timing:** Following Design Consultation, concurrent with Final Design Review
- **Goals of the Resiliency and Sustainability Review:**
 - Iterative working process to address remaining resiliency or sustainability compliance issues following Design Consultation, when necessary.
 - Finalize drawings before submitting for final design review and EGC Certification.
- **Next step:** Updated materials will be submitted to BLDS for Final Design Review.

Review the detailed
New Construction
Design Guidelines
Process.



HPD Design Review Process

Design Waivers

What are resiliency design waivers available for?

- Chapter 2, Section 2.1 (Flood Resistant Construction) and Section 2.2 (Stormwater Management)
- Restricted to building design features and not available for operational requirements
- Only apply to requirements within the HPD Design Guidelines and do not supersede any other regulatory or permitting requirements by HPD or other City agencies

Design waivers provided on as-needed basis when full compliance is determined to be infeasible by HPD.

- Loss of residential units
- Unmitigable technical or operational constraints
- Financial feasibility
- Alternatives mitigating flood risk to the maximum extent feasible have been identified and approved*.

HPD Design Review Process

Design Waivers

Submitting A Waiver:

- Applicants should submit a Design Waiver Request form **as early as possible** during schematic design once waiver needs are identified, but **no later than Milestone 1** submission of BLDS Design Review.
- A **complete submission** includes:
 - Completed Design Wavier Request form;
 - Relevant schematic drawings, including cellar, first floor and rooftop plans where necessary;
 - Narrative clearly outlining infeasibility of meeting resiliency requirements, and
 - Alternative mitigation proposed in lieu of full compliance.
- Tentative approval of a design waiver request will be provided ahead of submission, but a formal, signed Design Waiver Request Form will only be provided **after HPD accepts a Milestone 1 submission**.

HPD Design Waiver Request Form

INSTRUCTIONS: Certain deviations from the baseline requirements will be considered via a Design Waiver Request, if necessary. Evaluations of waiver requests will include the determination of the appropriateness of the proposed alternative(s). Waiver requests will be reviewed on a case-by-case basis and determinations will be based on the degree of technical infeasibility, financial infeasibility, impact on residents, or inability to comply with HPD's Electric Heating Policies. Applicant may submit up to 2 waiver requests on a single document.

NOTE: A waiver approval does not exempt any project from compliance with a code, zoning, or other legal requirement or a local law. If a project's design is modified or underlying conditions that affect the feasibility of meeting the waived conditions change, a new waiver will be required.

Have questions for Sustainability? Reach out: greencommunities@hpd.nyc.gov

Have questions for Resiliency? Reach out: resiliency@hpd.nyc.gov

PROJECT AND BUILDING INFORMATION		Auto-filled from INTAKE tab
Developer/ Sponsor Name		0
Architect of Record		0
MEP Engineer of Record		0
HPD 5-digit Project ID		0
HPD Project Name		0
HPD Primary Program		0
Are any of the sites defined as flood-prone?		0

WAIVER REQUEST #1		All cells must be filled out
Design Guidelines Criteria for which Waiver is being requested		
List all BBLs for which Waiver is being requested:		
Reason Waiver is being sought (please use cell below for further explanation):		
Additional explanation to support Waiver request (required): <i>For 2.1 and 2.2 Waivers: Provide illustrative and written materials to demonstrate why compliance is infeasible. Include diagram(s) and plan(s) showing location of building systems, sidewalk elevation, BFE, 2080s SLR-adjusted DFE, proposed building height, and any other pertinent information. Note whether units could be</i>		
Proposed substitution/ solution:		
If reason for Waiver is financial feasibility, provide estimate of cost impact compared to the proposed substitution/ solution:		
List of attached supporting documentation.		

WAIVER REQUEST #2		All cells must be filled out
-------------------	--	------------------------------

Enterprise Green Communities Pre-Authorization Form



Office of Policy and Strategy
Sustainability Unit

INSTRUCTIONS:

This form is required for all projects funded by HPD that are required to comply with the 2020 Enterprise Green Communities Criteria with NYC Overlay V2.0.

- Submit this tab along with the required submittals, the completed workbook, and a PDF of your signed HPD Design Waivers to greencommunities@hpd.nyc.gov
- Projects filing multiple EGC applications must use a separate form for each
- Gray cells are autopopulated
- Fill out all light blue cells

PROJECT INFORMATION

Project Name	0	HPD ID	0
Green Consultant	0	HPD Program	0
HPD Project Mgr	0	HPD Estimated Closing Date	
How many buildings in this project?			0
Project Classification			New Construction
ENERGY STAR Multifamily New Construction Certification Pathway			0
High-Performance Building Certification			0
Did project trigger Sustainability Review during Design Consultation?			No

HPD DESIGN WAIVERS - Project has received the following HPD Design Waivers

1.1b	Design building to meet Local Law 97's 2050 GHG emissions limits in 2050	
1.2a	All-electric heating/cooling and domestic hot water equipment	
2.1a	Elevate all residential units, critical mechanical, electrical and life safety equipment above the 2080s SLR-adjusted DFE	
4.2a	All-electric ranges, cooktops, ovens and clothes dryers	
4.3a	Infrastructure to accommodate future EV charging in all parking lots	
4.3b	At least one Level 2 electric vehicle (EV) charging station for 5% of parking spaces provided in a project.	
4.3c	Individual driveways, provide a dedicated branch circuit that is not less than 40-amp and 208/240-volt	

ENTERPRISE CRITERIA WAIVER - If project has received a waiver for the above HPD design criteria then the project must also seek a waiver for the following NYC Overlay Criteria. Waiver items are specific to the NYC Overlay requirements and **NOT** the full EGC Criteria.

		#N/A
5.5b	Moving to Zero Carbon: All Electric	#N/A
5.7	Energy Star Appliances	#N/A
5.9	Resilient Energy Systems: Flood Proofing	#N/A

Please use the space below to list any other EGC waivers that will be sought.

Climate Hazards in the Design Guidelines

Sea Level Rise

Tidal and Storm Surge Flooding



Precipitation

Stormwater Flooding



Heat

Higher Average Temps and Extreme Heat



Defining Flood-prone Sites

HPD Design Guidelines define flood-prone sites as:

- Sites within the **Special Flood Hazard Area**, comprised of the 2007 effective **Flood Insurance Rate Map (FIRM)** and **2015 Preliminary Flood Insurance Rate Map (PFIRM)**, whichever is more restrictive, or
- Sites located within the **2080s 1% annual chance coastal floodplain** per **NYC's Flood Hazard Mapper**, or
- Sites (or parts of sites) that are shown as adjacent to flooded areas in the **Extreme Stormwater Flood (100-year storm with 2080s SLR) scenario** in the **NYC Stormwater Flood Map**.

2.1 Flood Resistant Construction



NYC Flood Hazard Mapper showing the extent of the 2080s Future Projected Floodplain.

- Section 2.1 **Flood Resistant Construction** applies to sites defined as being within the **Special Flood Hazard Area** and/or the **2080s 1% annual chance coastal floodplain** per [NYC's Flood Hazard Mapper](#)
- According to the New York City Panel on Climate Change (NPCC)*, mid-range (25-75th percentile) projections for sea level rise are **25-39 inches by the 2080s**.
- The CRDG establish a **Sea Level Rise Adjusted Design Flood Elevation (SLR-adjusted DFE of 52"** for projects with a useful life through the 2080s.

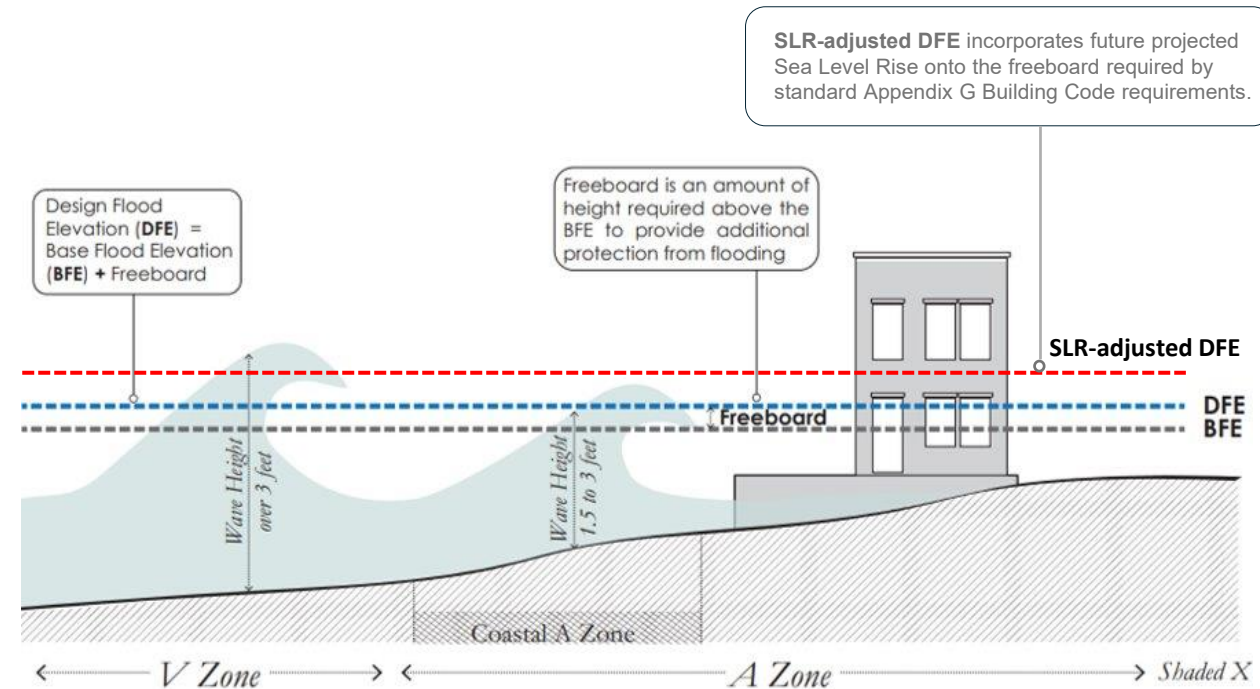
*Source: NPCC 2023 Special Climate Report. Projections for sea level rise are relative to the 1995 to 2014 base period

2.1 Flood Resistant Construction

Requirements for coastal flood-prone sites:

- **Elevate** all residential units, critical mechanical, electrical and life safety equipment and controls, services critical to building function, and at least one point of egress for each required egress pathway **above the 2080s SLR-adjusted Design Flood Elevation**.
- Dry floodproof critical equipment that cannot be elevated, ensuring that the top of permanent flood barriers are above 2080s SLR-adjusted DFE levels.*
- Design foundation, basement and ground floor structural elements for anticipated flood load.

* Design waiver required



Source: Adapted from NYC DCP Resilient Neighborhoods Study

2.1 Flood Resistant Construction

Additional requirements for coastal flood-prone sites include:

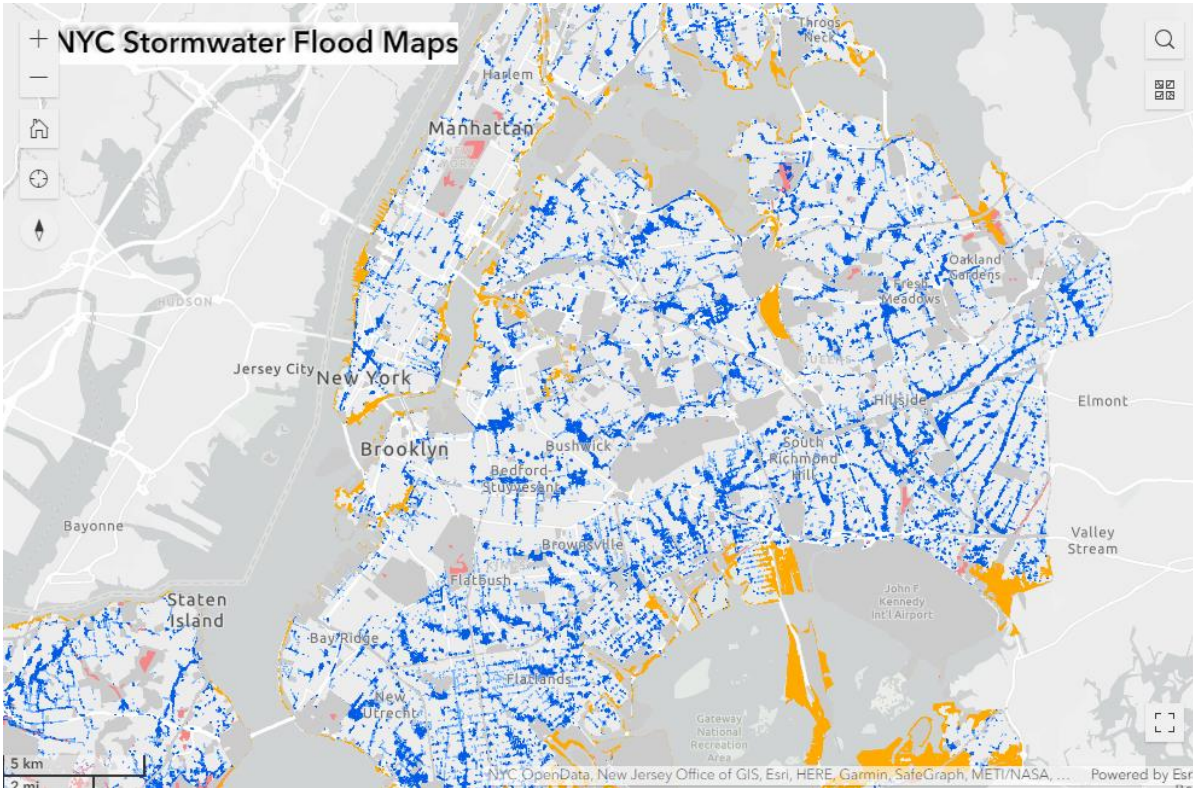
- Use flood resistant construction materials for all construction susceptible to flooding
- Install backwater valves with containment tanks and ejector pumps
- Limit paved surfaces to where they are required, use open-grid or permeable systems where possible
- Provide permanent signage in buildings and flood disclosure information on tenant leases
- Procure flood insurance



Beach Green Dunes I and II, Queens

Additional Reach recommendations referenced

2.2 Stormwater Management



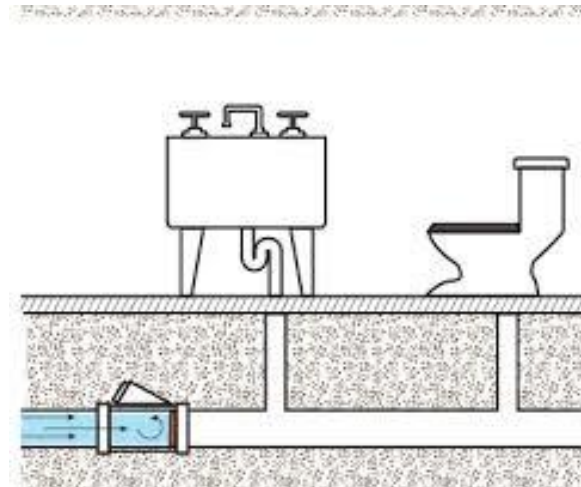
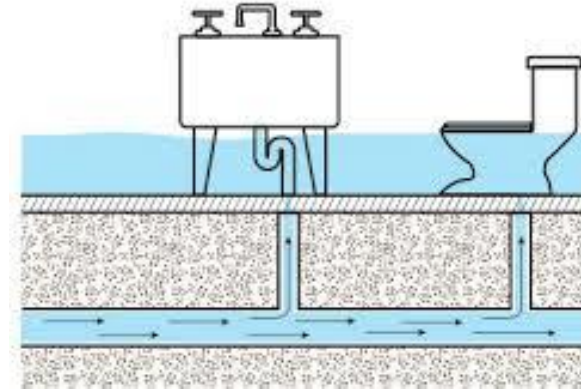
NYC DEP's Stormwater Flood Map showing the extent of the Extreme Stormwater Flood Area

- Section 2.2 **Stormwater Management** applies to sites (or parts of sites) shown as **adjacent to** flooded areas in the **extreme stormwater flooding** scenario in the [NYC Stormwater Flood Map](#)
 - The **extreme stormwater flooding** scenario models a present-day rainstorm of 3.6 in./hour
- The NPCC anticipates that by the 2080s, NYC could experience as much as **25 percent more annual rainfall** than today, and 1.5 times as many days with more than one inch of rain.

2.2 Stormwater Management

Requirements for stormwater flood-prone sites:

- **Elevate** all residential units, critical mechanical, electrical and life safety equipment and controls, services critical to building function, and at least one point of egress for each required egress pathway **above grade**.
- Dry floodproof critical equipment that cannot be elevated above grade.*
- Install **backwater valves** with containment tanks and ejector pumps in the lowest level of the building.



Source: NYC Department of Environmental Protection

* Design waiver required

2.2 Stormwater Management

Additional stormwater requirements include:

- Complying with DEP's **Unified Stormwater Rule (USWR)**
 - Projects that disturb 20,000 sf or more of soil or create 5,000 sf or more new impervious surface require a Stormwater Construction Permit
- All projects must **limit paved surfaces** to where they are required for programmatic site elements in favor of vegetated surfaces and/or vegetated stormwater retention systems
- Procure flood insurance.

Additional Reach recommendations referenced



Source: NYC Department of Environmental Protection

Identifying Critical Equipment

How is critical mechanical equipment defined?

The Design Guidelines for New Construction identify the following residential-serving building systems as critical utilities and equipment for the purposes of the resiliency requirements in Chapter 2, Section 2:

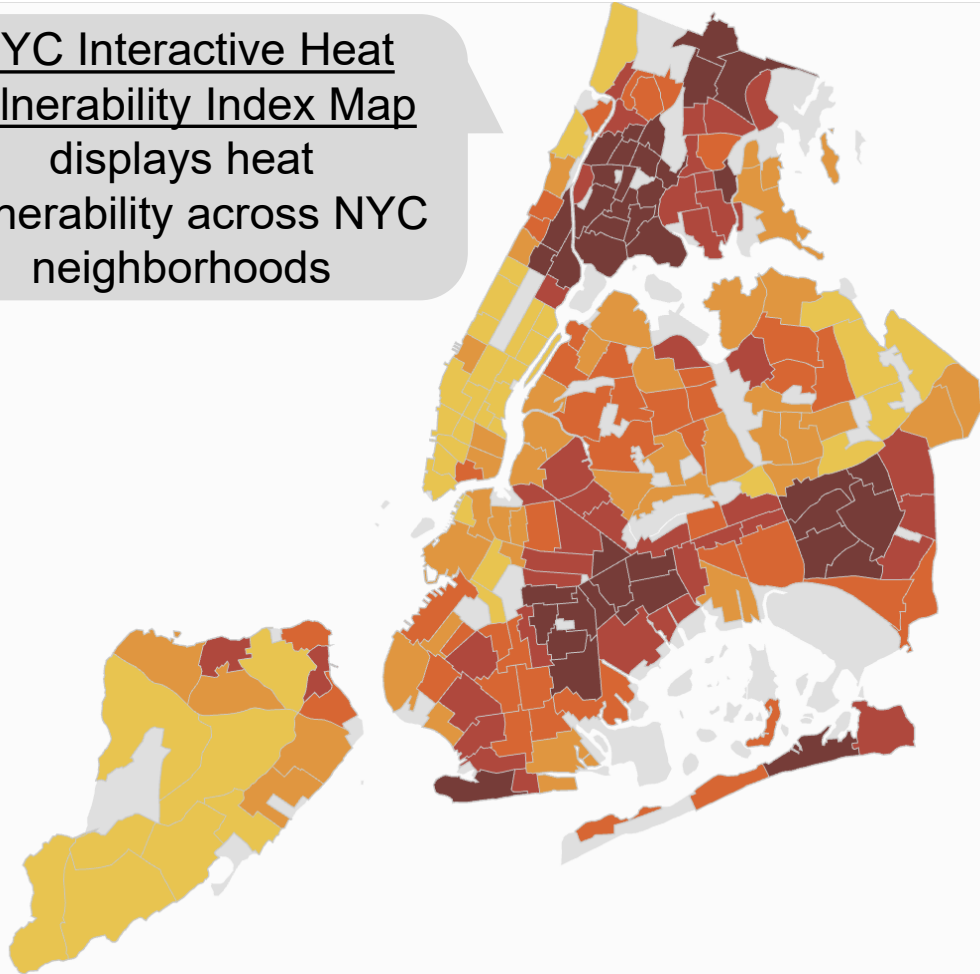
- HVAC systems
- Boilers, furnaces, and water heaters
- Fuel storage tanks
- Fire-suppression sprinkler controls
- Elevator machine rooms
- Electrical panels and switch gear
- Backup generators and other emergency backup systems
- Alarm controls and components
- Energy management systems
- Telecommunications equipment
- Electric and gas meters
- Utility shut-off switches



Source: NYC Department of Buildings

2.3 Extreme Heat

NYC Interactive Heat Vulnerability Index Map displays heat vulnerability across NYC neighborhoods



- Section 2.3 **Extreme Heat** provides requirements for mitigating the effects of extreme heat
- More New Yorkers die from heat every year than from any other type of extreme weather.
- 85% of NYC heat-stroke deaths happened after exposure to heat inside the home.
- Concentrations of heat-absorbing land cover and underinvestment in open space have contributed to heat impact concentration in high-heat neighborhoods.

2.3 Extreme Heat

Requirements for all HPD projects:

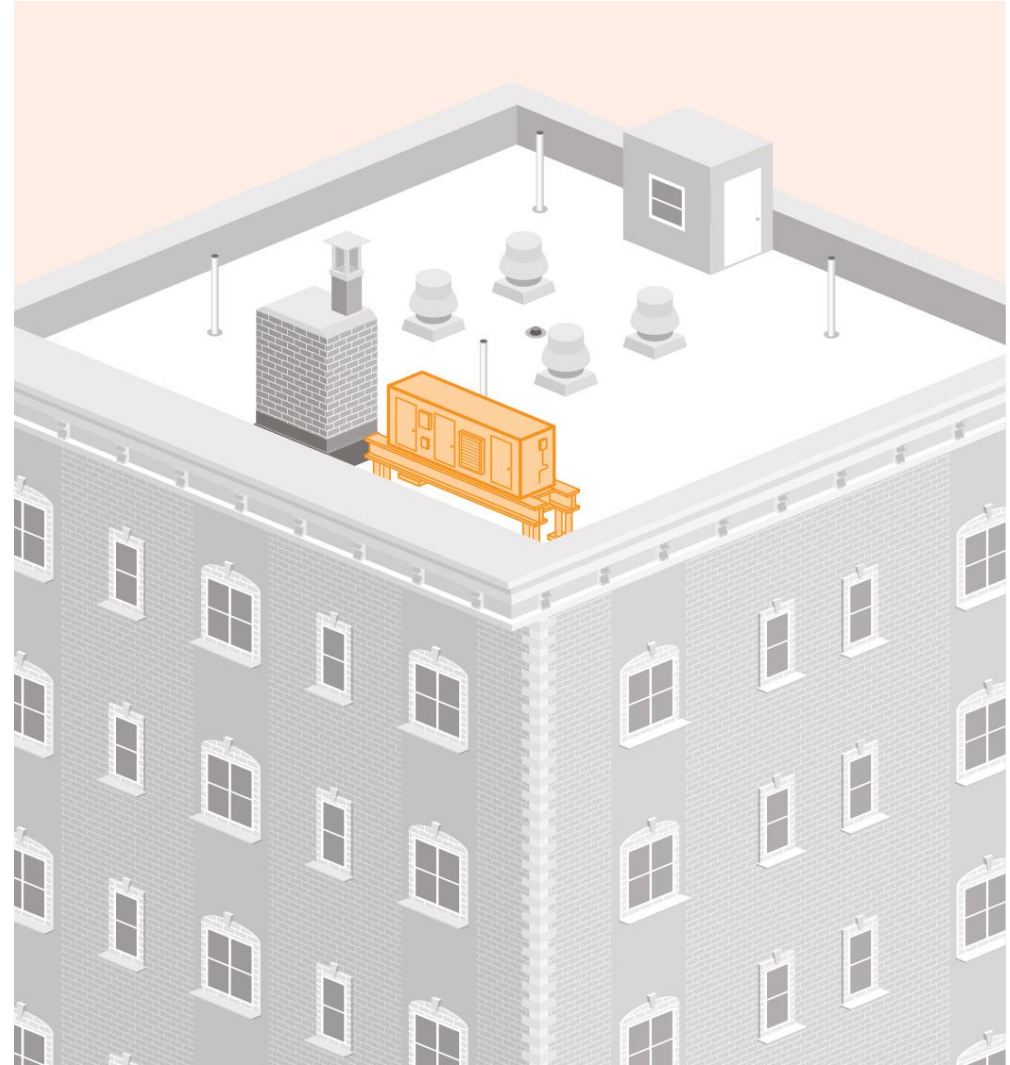
- All HPD-assisted projects must be designed and constructed to provide **ENERGY STAR rated or equivalent** cooling to all residents in all habitable rooms in all buildings. Refer to Section 3.2 for additional info.
- At least 50% of the site's hardscaped areas must use: **light colored, high-albedo materials** with an initial minimum solar reflectance of 0.33, or an open-grid pavement system.

2.3 Extreme Heat

- Requirements for **Senior Housing** or buildings with **low-mobility** populations in 50% or more units, and which are located in high-heat risk areas (HVI score of 4 or 5) that are not located within a 0.25-mile walk distance of dedicated, accessible open space:
 - Must provide **permanent open space** for use by all residents that is at least 80% unpaved except where necessary for programmatic uses, should provide shade to at least 75% of the area, and include seating.
 - See Section 2.3.b for full requirements

2.4 Backup Power and Passive Survivability

Section 2.4 Backup Power and Passive Survivability contains requirements that will ensure residents are safe in the event of an emergency.



Source: Enterprise: Strategies for Multifamily Building Resilience

2.4 Backup Power and Passive Survivability

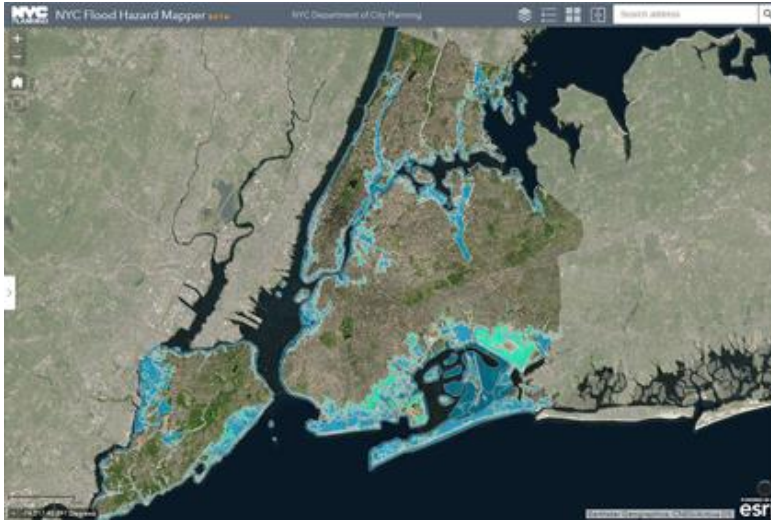
Requirements all HPD projects:

- Where backup power is not otherwise required, provide a **dedicated emergency panel** that can be safely and easily connected to an efficient generator, mobile generator or island-able solar system to power critical/emergency loads.

Requirements for Housing with seniors in at least 50% of units:

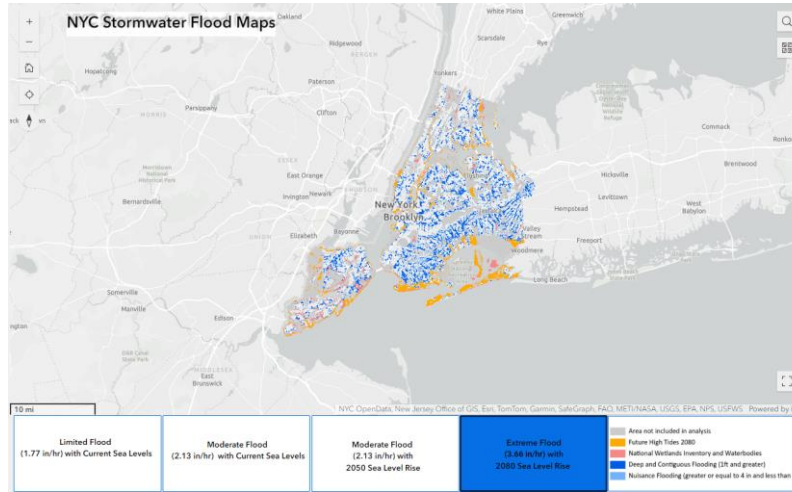
- **Adequate backup power generation** - in addition to service for critical/emergency loads - to ensure that at least one elevator remains functional during an emergency
- A community space (or spaces) that can serve as a "**Place of Refuge**" equal to 15 SF per bedroom that is accessible to all residents that includes backup power for heating, cooling, lighting, outlets, WiFi, at least one refrigerator for every 50 bedrooms (or approximately 0.5 cubic feet per bedroom), and at least one accessible bathroom with a potable water source. Space must have natural ventilation and lighting.

Climate Screening Tools



NYC Flood Hazard Mapper

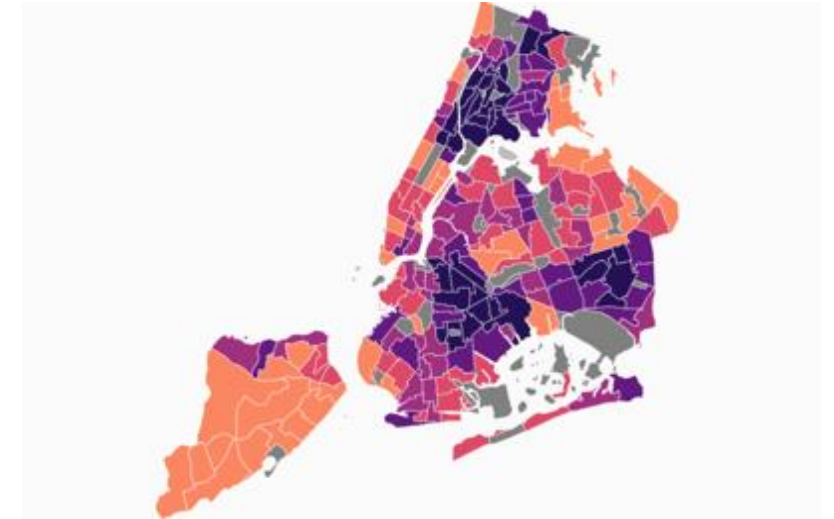
Displays current and future coastal flood hazards for the city, including current and future projected floodplains as well high tide marks adjusted for sea level rise.



Stormwater Flood Maps

Depict a range of stormwater flood scenarios that reflect current and future risk.

Reflect Deep and Contiguous Flooding (1ft and greater) and Nuisance Flooding (greater or equal to 4 in and less than 1ft) under Moderate and Extreme Stormwater conditions.



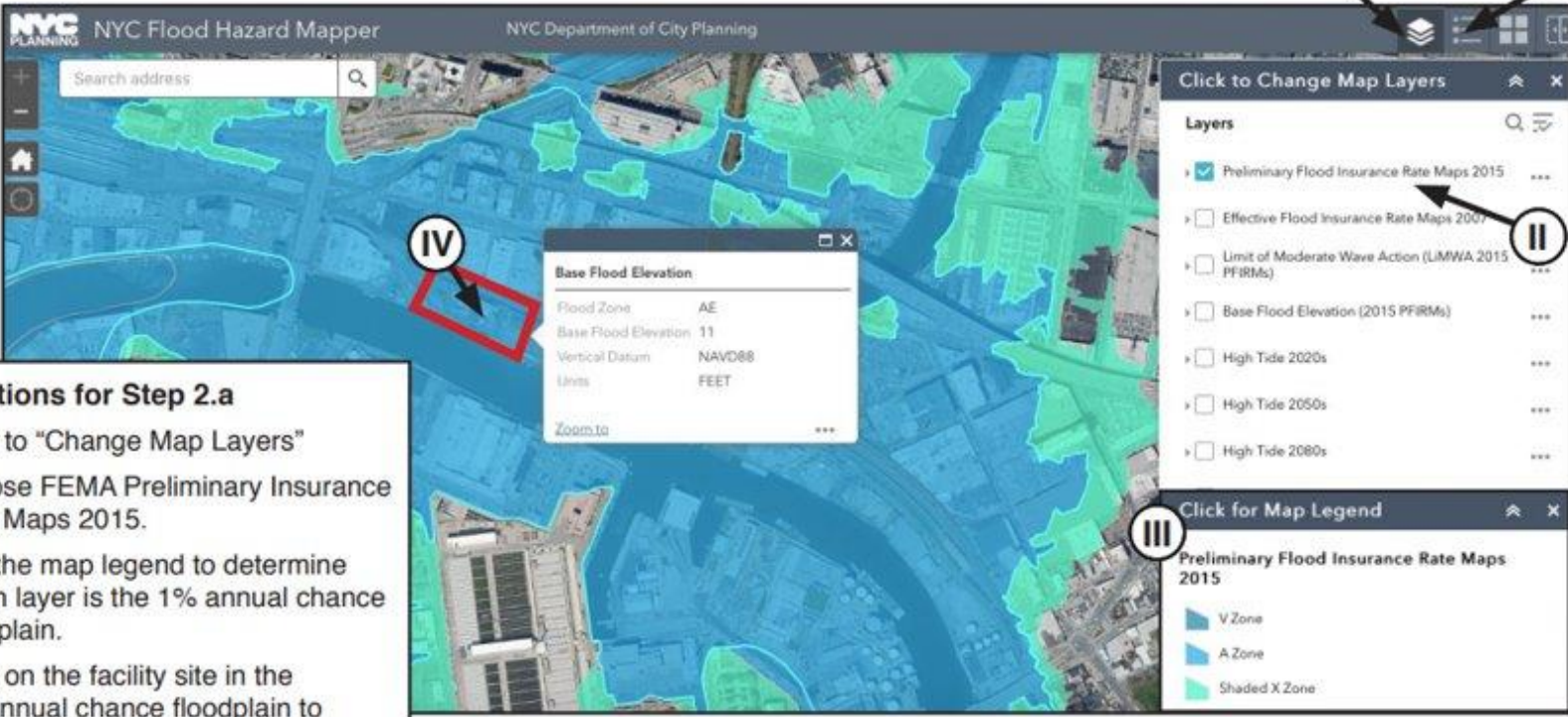
Heat Vulnerability Index (HVI)

Shows the risk of community-level heat impacts due to extreme heat events.

It is made up of data on surface temperature, green space, air conditioning access, poverty, and Black population (the population most excluded from heat resources).

Screening Sites for Climate Hazards

Current Flood Plain



The screenshot displays the NYC Flood Hazard Mapper interface. The main map area shows a flood hazard map with various colored zones. A red rectangle labeled 'IV' highlights a specific area on the map. A pop-up window titled 'Base Flood Elevation' provides details for the selected area: Flood Zone: AE, Base Flood Elevation: 11, Vertical Datum: NAVD88, Units: FEET, and a Zoom to button. On the right side, there are two panels. The top panel, 'Click to Change Map Layers', lists several layers, with 'Preliminary Flood Insurance Rate Maps 2015' selected and checked. The bottom panel, 'Click for Map Legend', shows the legend for the 'Preliminary Flood Insurance Rate Maps 2015', including V Zone, A Zone, and Shaded X Zone. Numbered callouts I, II, and III point to the 'Click to Change Map Layers' panel, the 'Preliminary Flood Insurance Rate Maps 2015' layer, and the 'Click for Map Legend' panel, respectively.

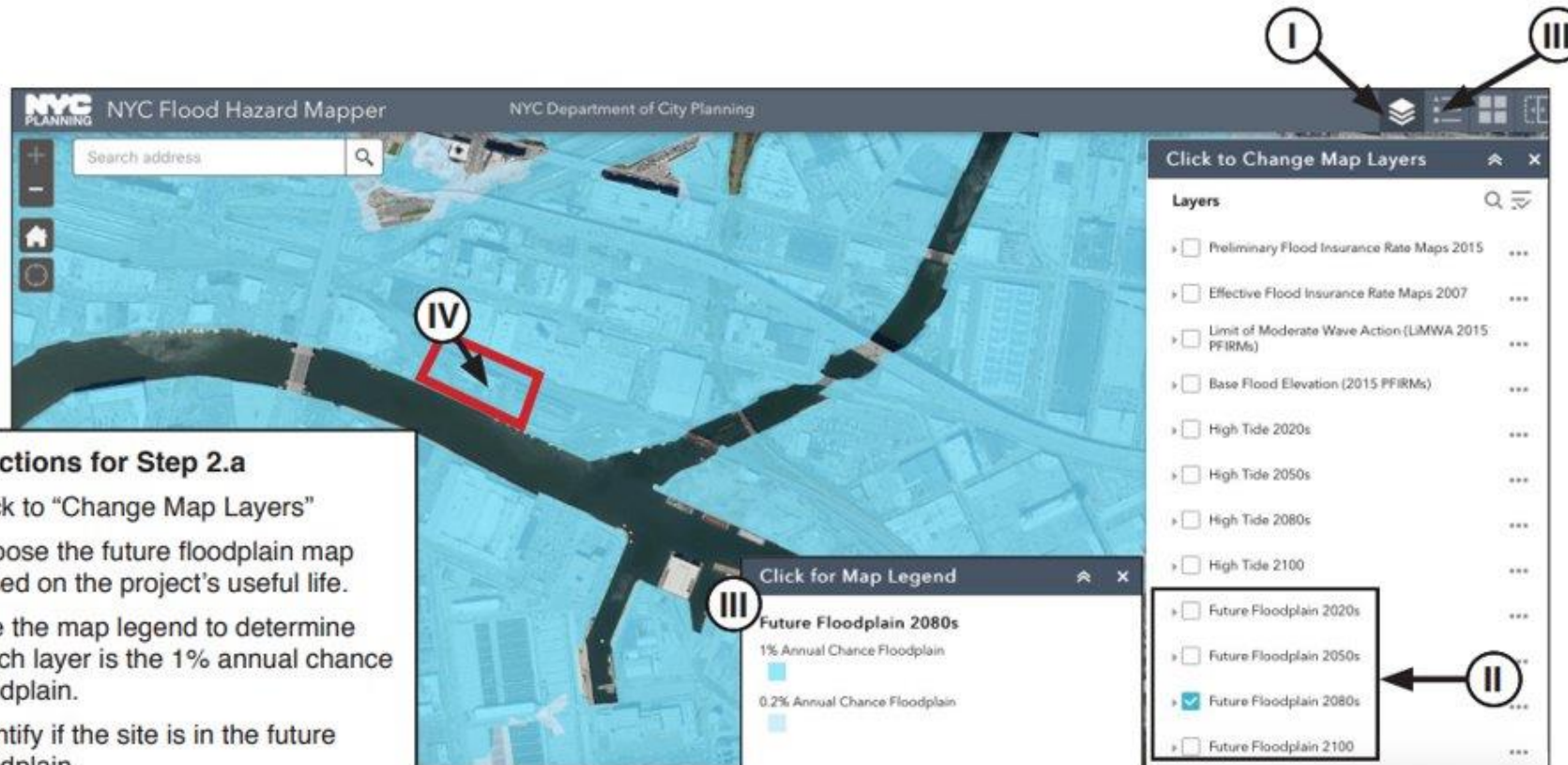
Instructions for Step 2.a

- I Click to "Change Map Layers"
- II Choose FEMA Preliminary Insurance Rate Maps 2015.
- III Use the map legend to determine which layer is the 1% annual chance floodplain.
- IV Click on the facility site in the 1% annual chance floodplain to determine the base flood elevation.

Using the [Flood Hazard Mapping Tool](#), FEMA's **Preliminary Flood Insurance Rate Maps 2015 (PFIRM 2015)** can be selected from the map layers menu from the right side of the screen to determine whether a site is located within the current floodplain.

Screening Sites for Climate Hazards

Future Flood Plain



Instructions for Step 2.a

- ❶ Click to "Change Map Layers"
- ❷ Choose the future floodplain map based on the project's useful life.
- ❸ Use the map legend to determine which layer is the 1% annual chance floodplain.
- ❹ Identify if the site is in the future floodplain.

If the site is not within the PFIRM 2015, the Flood Hazard Mapper can be used to determine future risk from flooding. Select the **Future Floodplain** corresponding to the project's useful life from the map layers menu.

Screening Sites for Climate Hazards

Calculating Design Flood Elevation

Current Building Code design flood elevations (DFE) are determined by using the **base flood elevation** (BFE) established by the FEMA PFIRM 2015 and adding 2 feet of **freeboard** as required by Appendix G of the Building Code on Flood Resistant Construction.

In the CRDG, an additional sea level rise adjustment is added in accordance with the end of the building's useful life to arrive at the **Sea Level Rise-adjusted design flood elevation** (SLR-adjusted DFE).

Table 5 - Determine the sea level rise-adjusted design flood elevation (DFE) ⁵³				
Critical* and Non-critical Facilities				
End of Useful Life	Base Flood Elevation (BFE) ⁵⁴ in NAVD 88	+ Freeboard ⁵⁵	+ Sea Level Rise Adjustment ⁵⁶	= Design Flood Elevation (DFE) in NAVD 88
2020s (through to 2039)	FEMA 1% (PFIRM)	24"	6"	= FEMA 1% + 30"
2050s (2040-2069)	FEMA 1% (PFIRM)	24"	16"	= FEMA 1% + 40"
2080s (2070-2099)	FEMA 1% (PFIRM)	24"	28"	= FEMA 1% + 52"
2100+	FEMA 1% (PFIRM)	24"	36"	= FEMA 1% + 60"
Additional analysis should be conducted to incorporate wave action and wave run-up in DFE calculations especially in areas that are located within the FEMA's 1% annual chance Limit of Moderate Wave Action (LiMWA) zone. Wave run-up is the maximum vertical extent of wave uprush above surge.				

Source: Climate Resiliency Design Guidelines V4.1

Screening Sites for Climate Hazards

Calculating SLR-adjusted Design Flood Elevation

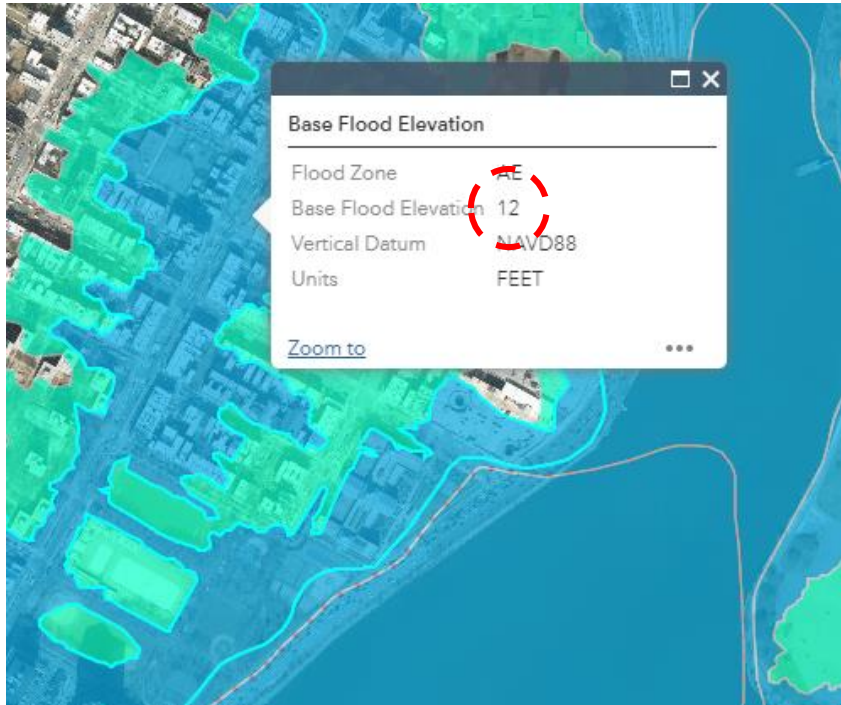


Table 5 - Determine the sea level rise-adjusted design flood elevation (DFE) ⁵³				
Critical ^a and Non-critical Facilities				
End of Useful Life	Base Flood Elevation (BFE) ⁵⁴ in NAVD 88	+ Freeboard ⁵⁵	+ Sea Level Rise Adjustment ⁵⁶	= Design Flood Elevation (DFE) in NAVD 88
2020s (through to 2039)	FEMA 1% (PFIRM)	24"	6"	= FEMA 1% + 30"
2050s (2040-2069)	FEMA 1% (PFIRM)	24"	16"	= FEMA 1% + 40"
2080s (2070-2099)	FEMA 1% (PFIRM)	24"	28"	= FEMA 1% + 52"
2100+	FEMA 1% (PFIRM)	24"	36"	= FEMA 1% + 60"

Additional analysis should be conducted to incorporate wave action and wave run-up in DFE calculations especially in areas that are located within the FEMA's 1% annual chance Limit of Moderate Wave Action (LiMWA) zone. Wave run-up is the maximum vertical extent of wave uprush above surge.

$$12' + 2' + 28'' = 16' 4''$$

Diagram illustrating the calculation of the SLR-adjusted Design Flood Elevation (DFE) for a housing project in the 2080s:

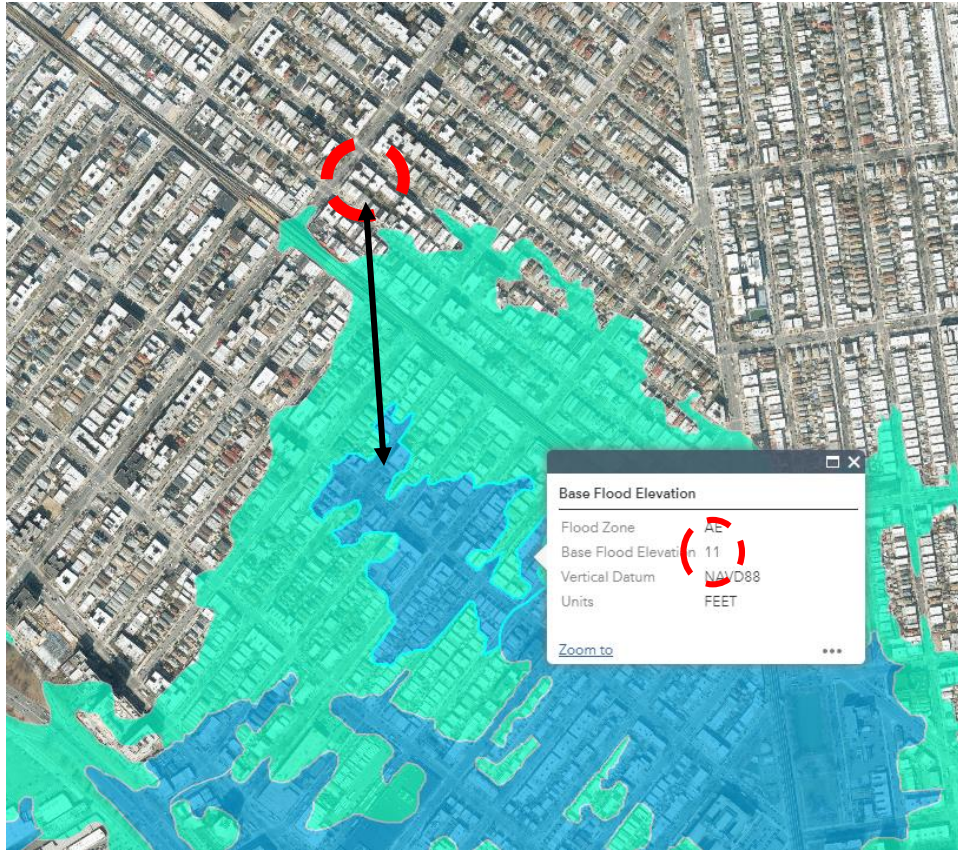
- 12'**: BFE (Base Flood Elevation)
- 2'**: Appendix G Freeboard
- 28"**: 2080s Sea Level Rise Adjustment
- 16' 4"**: CRDG SLR-adjusted Design Flood Elevation (DFE)

A housing project on this site with a useful life into the 2080s would have to be built to a SLR-adjusted Design Flood Elevation of **16' 4" NAVD88***.

*NAVD88 refers to North American Vertical Datum of 1988, a reference tidal benchmark elevation used to calculate flood elevations.

Screening Sites for Climate Hazards

Calculating Design Flood Elevation



When a project is located in the future floodplain, the base flood elevation from the closest 1% annual storm area on the FEMA 2015 PFIRM is used to calculate DFE.

Table 5 - Determine the sea level rise-adjusted design flood elevation (DFE)⁵³

Critical ¹ and Non-critical Facilities				
End of Useful Life	Base Flood Elevation (BFE) ⁵⁴ in NAVD 88	+ Freeboard ⁵⁵	+ Sea Level Rise Adjustment ⁵⁶	= Design Flood Elevation (DFE) in NAVD 88
2020s (through to 2039)	FEMA 1% (PFIRM)	24"	6"	= FEMA 1% + 30"
2050s (2040-2069)	FEMA 1% (PFIRM)	24"	16"	= FEMA 1% + 40"
2080s (2070-2099)	FEMA 1% (PFIRM)	24"	28"	= FEMA 1% + 52"
2100+	FEMA 1% (PFIRM)	24"	36"	= FEMA 1% + 60"

Additional analysis should be conducted to incorporate wave action and wave run-up in DFE calculations especially in areas that are located within the FEMA's 1% annual chance Limit of Moderate Wave Action (LiMWA) zone. Wave run-up is the maximum vertical extent of wave uprush above surge.

$$11' + 2' + 28" = 15' 4"$$

BFE Appendix G Freeboard 2080s Sea Level Rise Adjustment CRDG Design Flood Elevation (DFE)

A housing project on this site with a useful life into the 2080s would have to be built to a SLR-adjusted Design Flood Elevation (DFE) of **15' 4"** NAVD88.

Screening Sites for Climate Hazards

Stormwater Flood Map

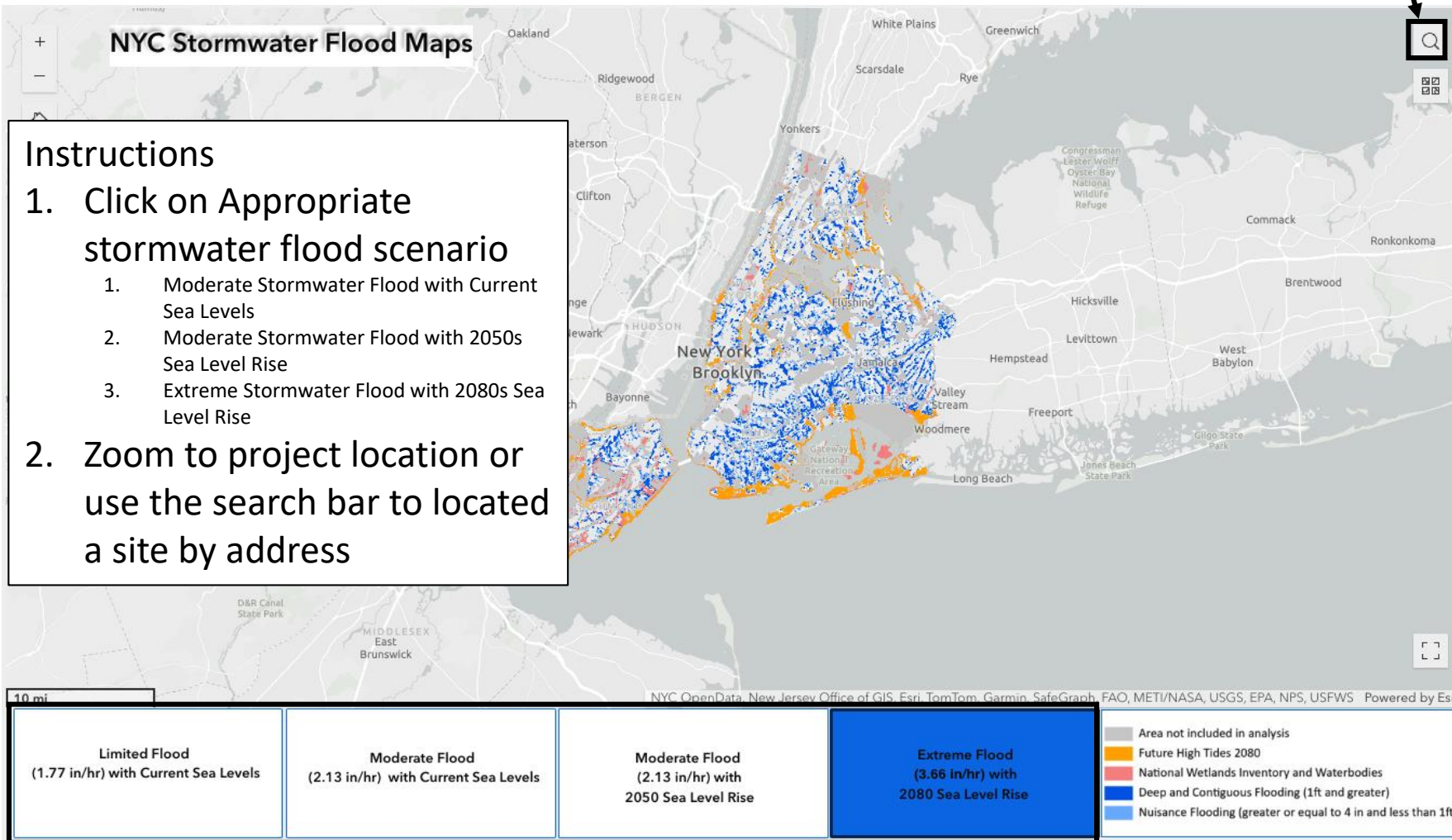
2

Risk of stormwater flooding can be approximated using the NYC DEP [Stormwater Flood Map](#).

Instructions

1. Click on Appropriate stormwater flood scenario
 1. Moderate Stormwater Flood with Current Sea Levels
 2. Moderate Stormwater Flood with 2050s Sea Level Rise
 3. Extreme Stormwater Flood with 2080s Sea Level Rise
2. Zoom to project location or use the search bar to located a site by address

Selecting the map from the bottom menu corresponding to the project's useful life, assess whether the site, primary access roads, primary road frontage at the site, and/or immediately adjacent properties are shown to be at risk.



1

Screening Sites for Climate Hazards

Stormwater Flood Map



Because the **NYC Stormwater Flood Maps** largely map flood risk along public rights-of-way, HPD has adopted an **adjacency requirement** for development sites.

If any part of a project site is adjacent to a roadway or other public right-of-way shown as flooded on the **Extreme Stormwater Flood** scenario map, then that site is considered at risk of stormwater flooding and must comply with **Section 2.2**.

Screening Sites for Climate Hazards Heat

Vulnerability to extreme heat is evaluated using the Heat Vulnerability Index, which can be viewed using the NYC DOHMH [Interactive Heat Vulnerability Map](#)

Each Neighborhood Tabulation Area (NTA) in the city is scored from 1-5 based on physical, social, and economic factors associated with increased risk of heat-related morbidity and mortality

★ Interactive Heat Vulnerability Index

Hot weather is dangerous. In New York City – and across the country – more people die from heat than from all other natural disasters combined. As our climate continues to warm, we expect more heat events that can put people's lives at risk.

In New York City, the risk of death from heat is unfairly distributed across neighborhoods. We identified neighborhood environmental and social factors associated with increased risk to create a heat vulnerability index. This can identify neighborhoods at highest risk and help inform neighborhood-level policies and programs that can protect people – sending resources to where they're needed the most.

Use this Heat Vulnerability Explorer to look up your neighborhood's heat vulnerability and the neighborhood characteristics that affect it.

Enter a neighborhood to get data:

Get Data

Your neighborhood:

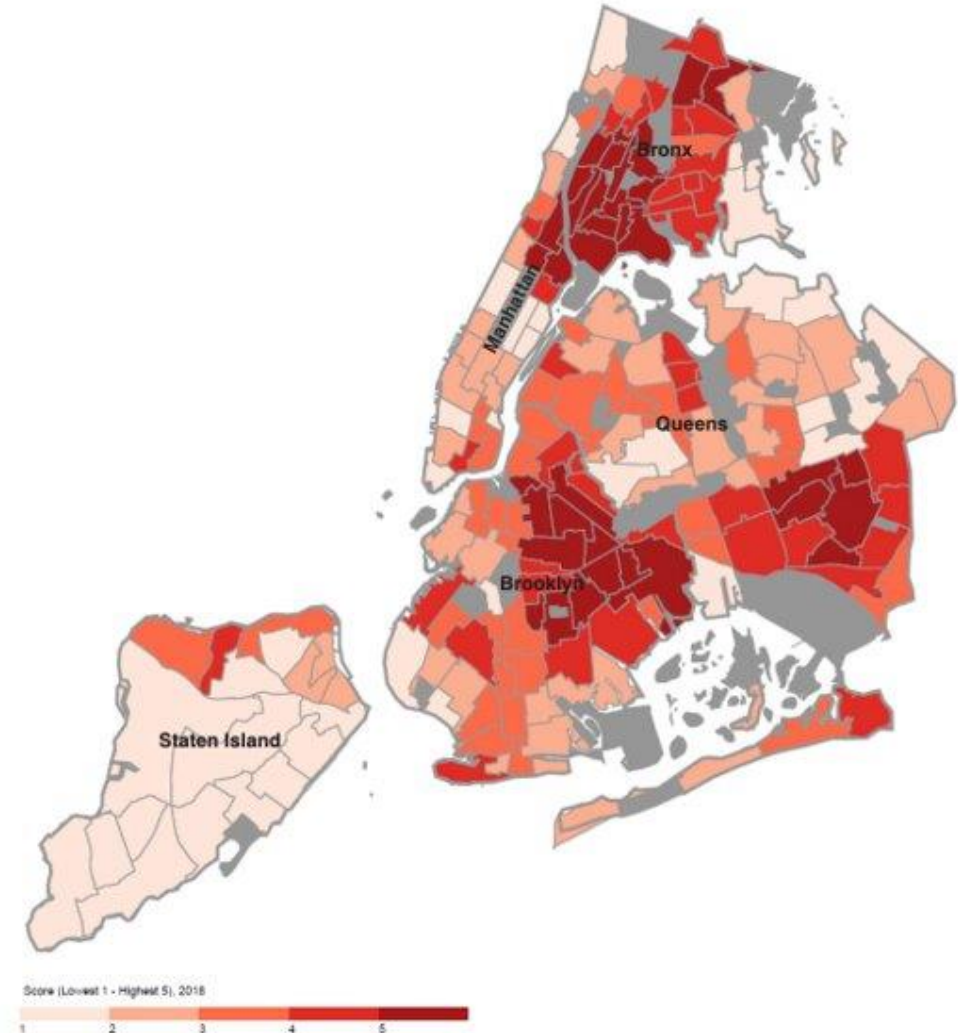
No neighborhood selected. Enter an address above.

This is a Neighborhood Tabulation Area. Read about NTAs.

Heat vulnerability:

No neighborhood selected. Enter an address above.

Neighborhoods are ranked from 1 (lowest risk) to 5 (highest risk).



Source: Heat Vulnerability Index (HVI) for New York City Neighborhood Tabulation Areas (NTA) (NYCDOHMH 2018)

Thank You!

Further questions can be submitted to Resiliency@hpd.nyc.gov

Additional resources on resiliency:

- [Climate Resiliency Design Guidelines](#)
- [HPD Resiliency](#) (*Updated soon with additional resources*)
- [HPD Sustainability](#)
- [HPD BLDS](#)



Source: NYC DCP Retrofitting Buildings for Flood Risk