

RESILIENT BUILDING DESIGN GUIDELINES ADDENDUM

VIRTUAL PUBLIC MEETING

TUESDAY, JUNE 7, 2022 | 6:00 – 7:00 PM



Michael Baker
INTERNATIONAL

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Resilient Building
Design Guidelines

October 19th 2013

Addendum to the
2015 Guidelines

Meeting Link: https://us06web.zoom.us/meeting/register/tZlkfuGqqz4vGNT_aekLCoxNKRwXqq7yiEEb

HOUSEKEEPING ITEMS

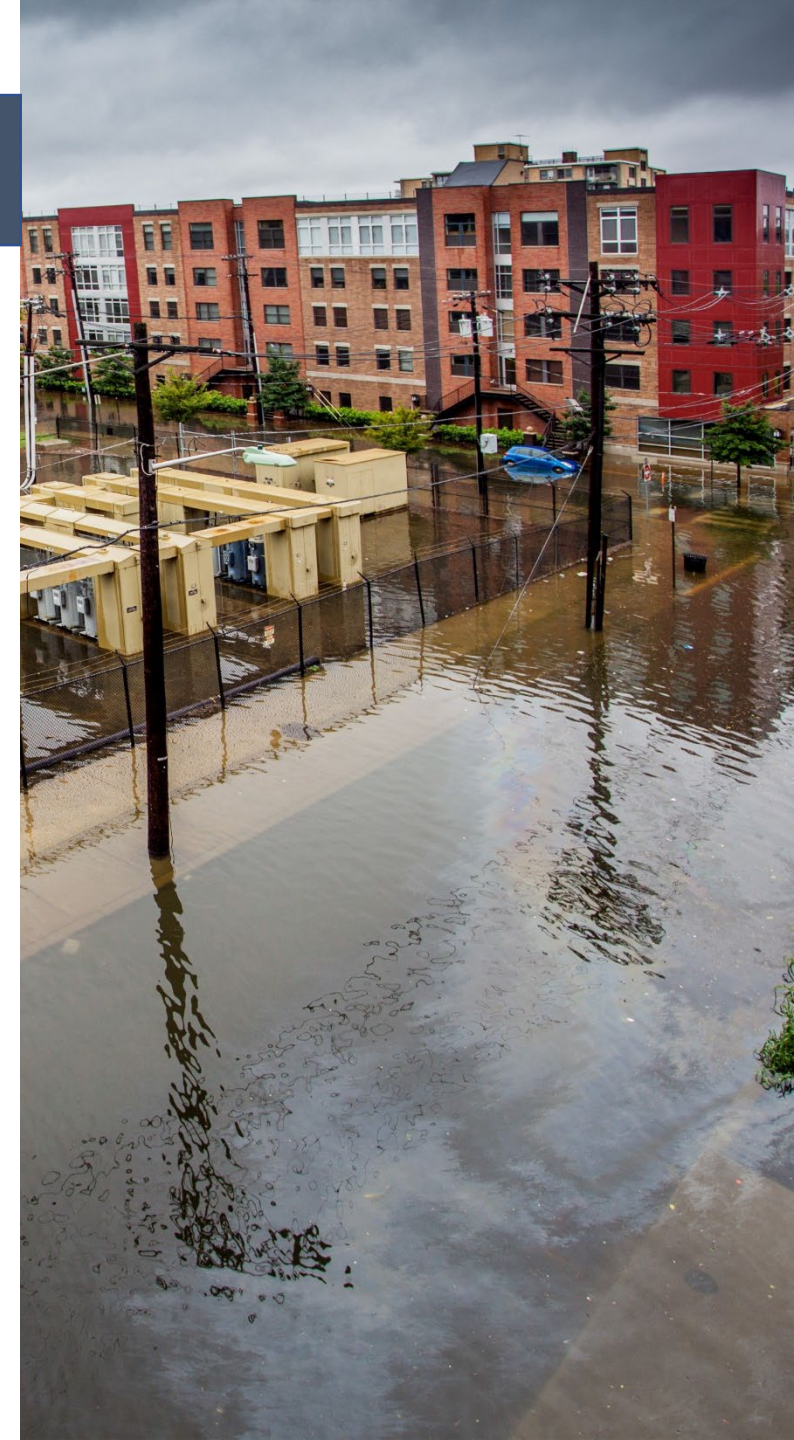
- All participants will be muted until the conclusion of the presentation
- Please hold verbal Q&A until the conclusion of the presentation
- The chat and meeting will be recorded if questions need to be addressed at the conclusion of the presentation



BACKGROUND

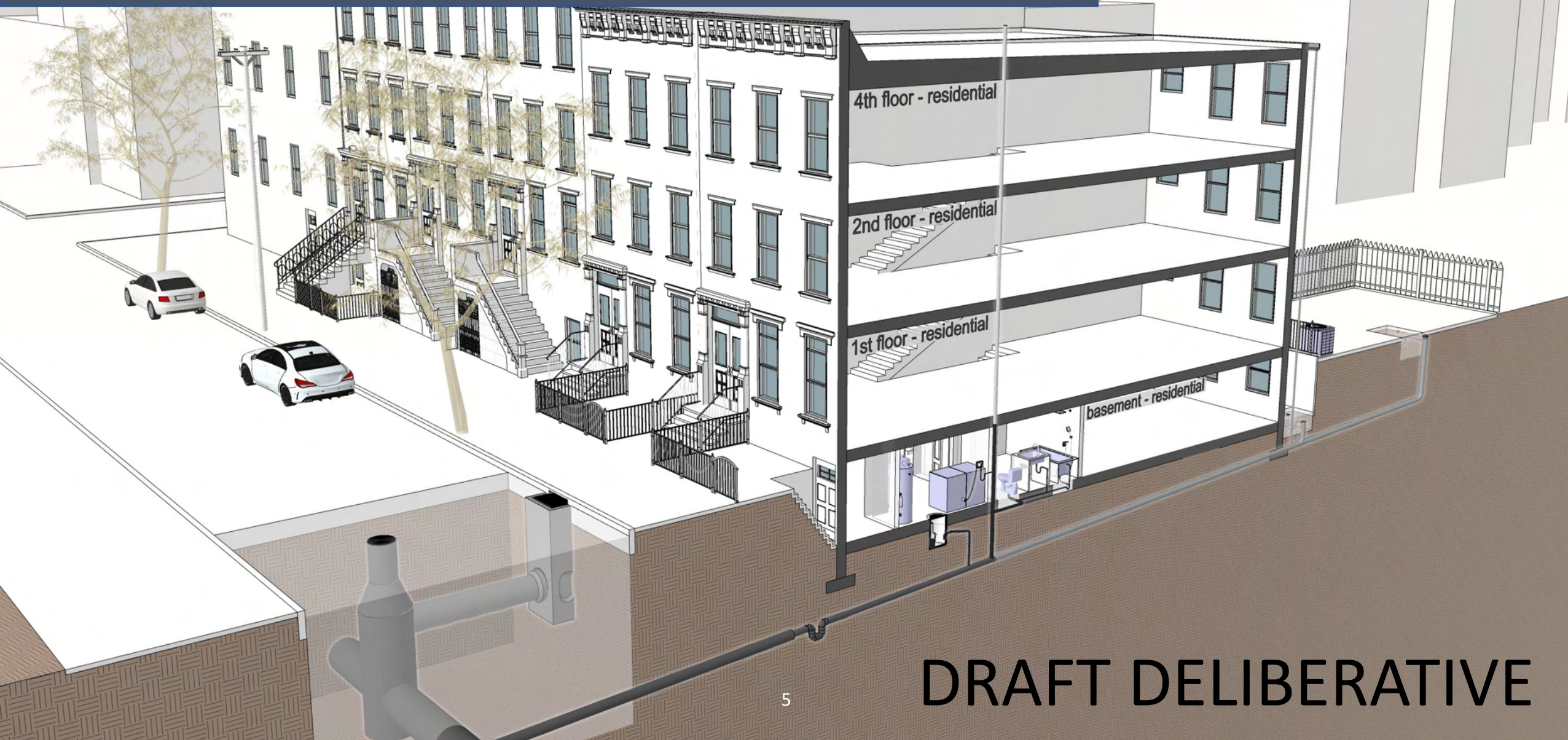
Project Timeline

- **October 13, 2021:** Resilient Buildings Workshop
 - Information about how residents can reduce risk to their buildings from flood damage and lower their flood insurance rates.
- **April/May 2022:** Building Design Guidelines Update
 - Site visits to understand the various building typologies and flooding concerns.
 - Met with residents to understand the flooding issues and potential mitigation actions to reduce the risk of property damage.
 - Coordinated with NHSA on potential strategies.
- **July 2022:** Resilient Building Design Guidelines Addendum
 - Addendum will be released to the public.

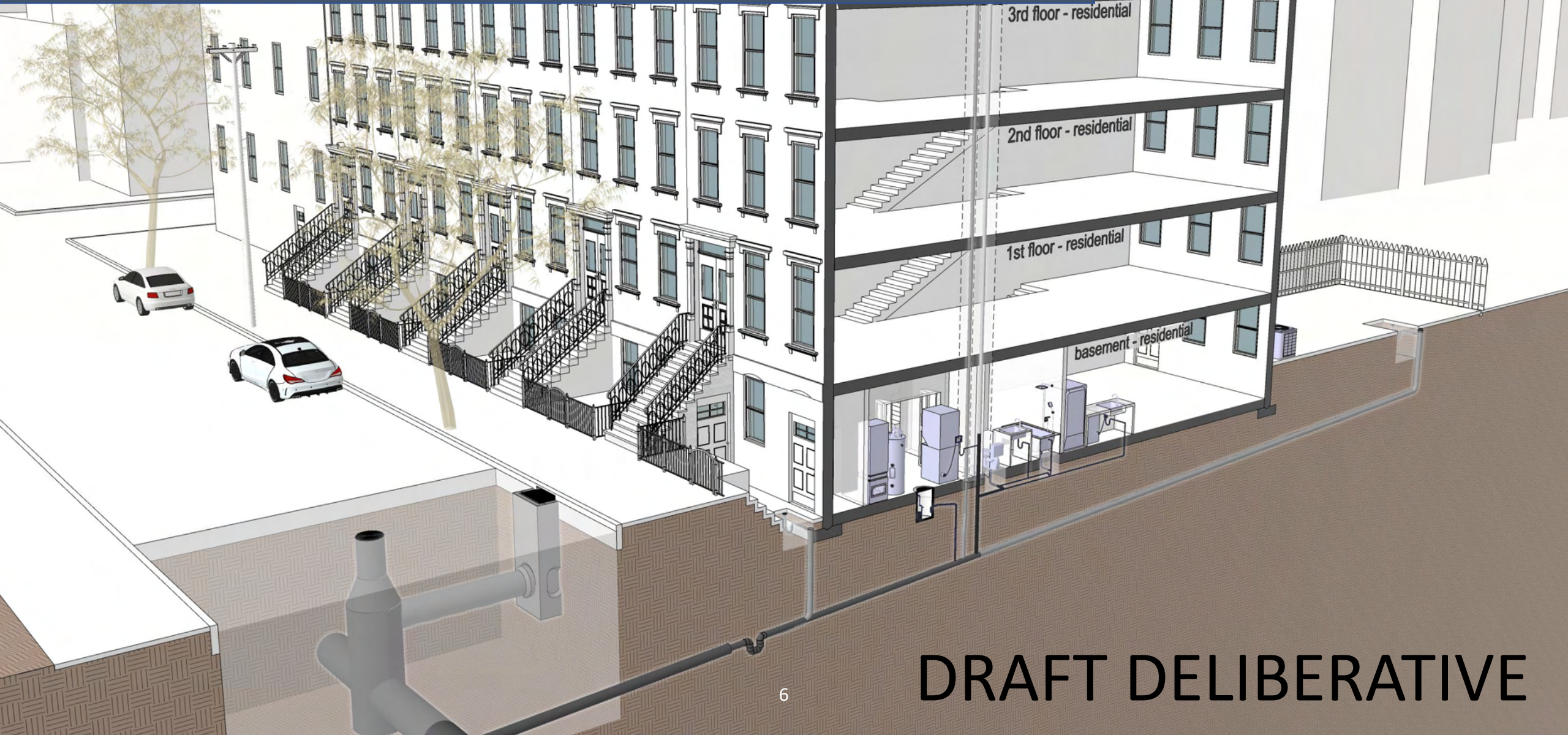




HOUSING TOPOLOGY: CELLAR

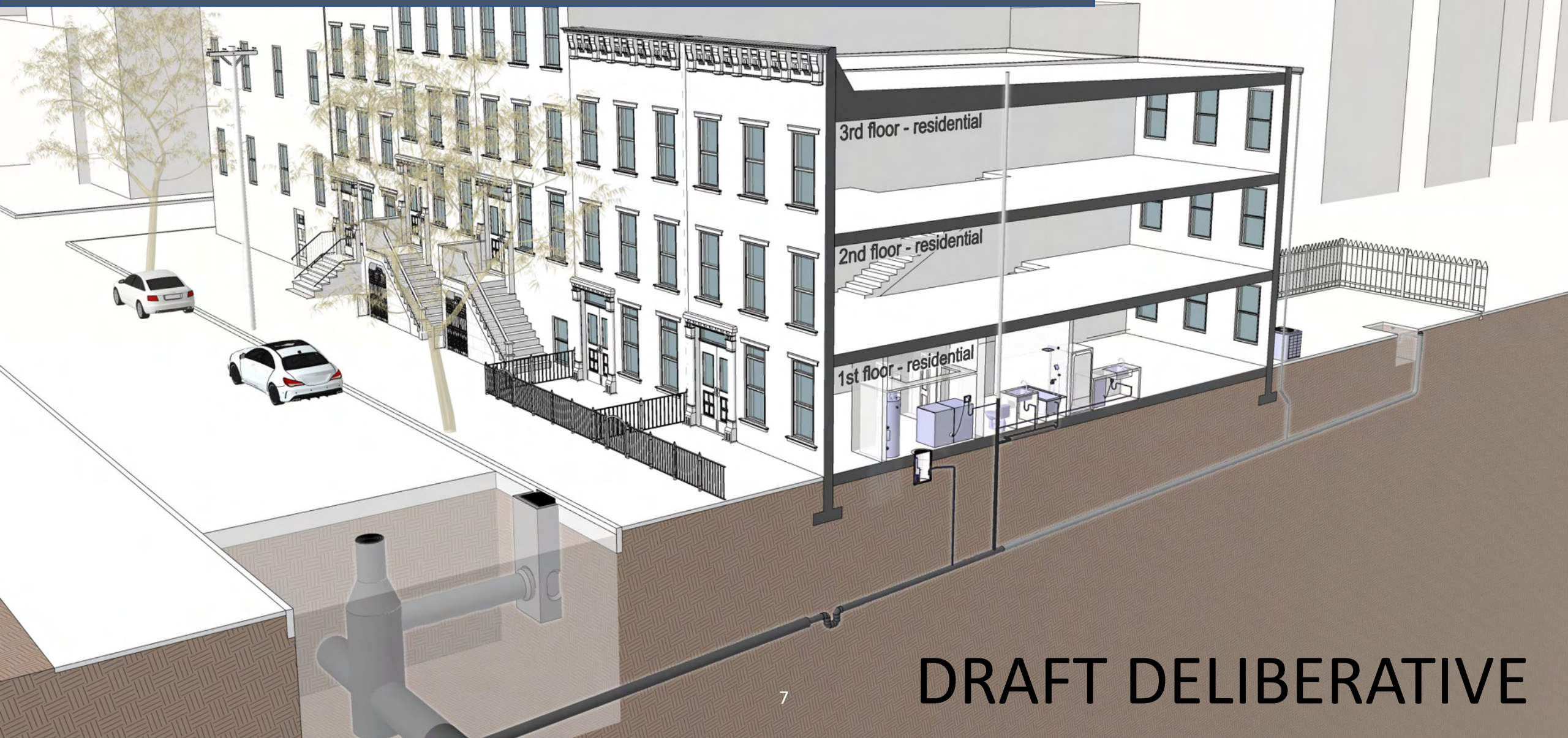


HOUSING TOPOLOGY: GARDEN APARTMENT



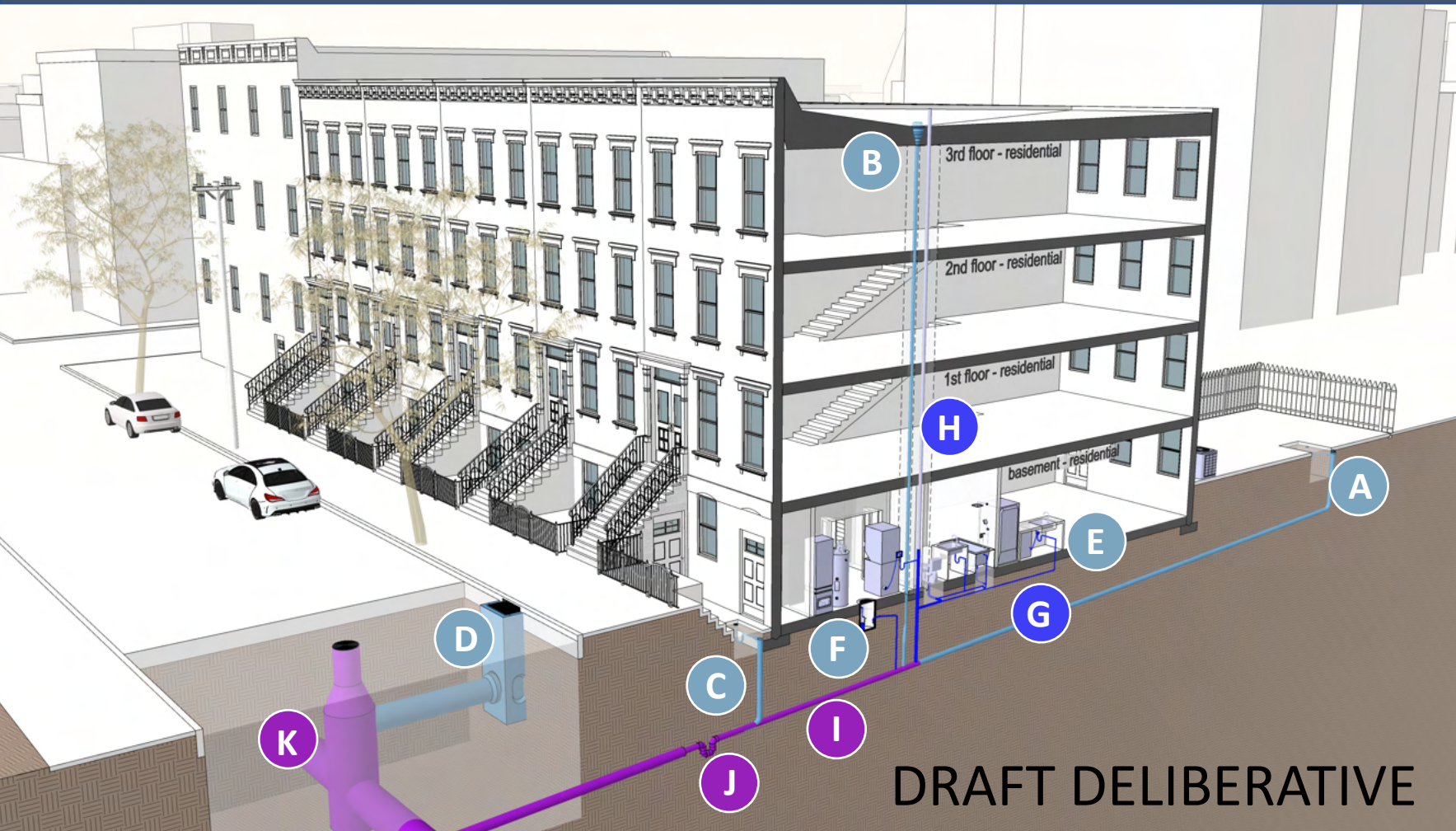
DRAFT DELIBERATIVE

HOUSING TOPOLOGY: FLUSH



DRAFT DELIBERATIVE

THE SEWER SYSTEM



STORMWATER

- A YARD DRAIN
- B ROOF DRAIN
- C EXTERIOR FLOOR DRAIN
- D STORMWATER INLET

GROUNDWATER

- E INTERIOR FLOOD DRAIN
- F SUMP PIT WITH PUMP

WASTEWATER

- G FIXTURE DRAINS WITH TRAPS
- H VENT STACK

COMBINED INFRASTRUCTURE

- I SEWER LATERAL
- J HOUSE TRAP
- K SEWER MAIN

WHAT'S INCLUDED IN THE ADDENDUM

- **Why Hoboken Floods and How to Prepare**
- **Evaluating What Makes Sense for Your Property**
- **Strategies for Reducing Flood Risk to Your Home**
 - **Maintain Indoor & Outdoor Infrastructure**
 - **Floodproofing Strategies: Prevent Flooding**
 - **Flood-Resistant Construction Strategies: Lessen the Effects of Flooding**
 - **Alleviate the Burden on the Sanitary System: Reduce Water Use & Stormwater Runoff**
- **Permitting & Approvals**



STRATEGIES FOR REDUCING FLOOD RISK



Maintain Indoor & Outdoor Infrastructure

- Scope/Send camera down the sewer lateral
- Tree root tracing and removal
- Repair or replace malfunctioning house connection piping
- Repair or replace defective and/or leaking plumbing fixtures
- Repair or replace lateral house connection
- Repair or replace collapsed house traps



Flood-Resistant Construction Strategies: Lessen the Effects of Flooding

- Water-Resistant Materials
- Install Flood Alert System
- Anchor Fuel Tanks
- Floodproof Equipment
- Elevate Equipment
- Flood Vents
- Raise Cellar or Basement Floor above BFE
- Fill in Cellar or Basement



Floodproofing Strategies: Prevent Flooding

- Flood Barrier System
- Seal Openings
- Perimeter or Basement Drainage
- Sump Pumps
- Check Valves
- Ejector Pump



Alleviate the Burden on the Sanitary System: Reduce Water Use & Stormwater Runoff

- Disconnect or redirect downspouts away from CSO
- Disconnect sump pump from CSO
- Retain stormwater
- Decrease stormwater runoff

STRATEGY FACT SHEETS

- Quick Facts

- **Complexity** – *Is this strategy easy, medium, or hard to implement?*
- **Cost** – *Is this action affordable, moderately priced, or expensive?*
- **Applicability** – *Who might this strategy work for?*
- **Longevity** – *How long will this last?*
- **Permits** – *Are permits required?*
- **Contractor** – *Do you need a professional to install?*

- Description

- How This Could Help

- Materials & Considerations

- Maintenance

- Resources

SECTION 4. STRATEGIES FOR REDUCING FLOOD RISK TO YOUR HOME

4.4: ALLEVIATE THE BURDEN ON THE SANITARY SYSTEM: REDUCE WATER USE & STORMWATER RUNOFF

E DRY WELL

COMPLEXITY	COST	APPLICABILITY	LONGEVITY	PERMITS	CONTRACTOR
1	\$	SINGLE FAMILY HOME	30 YEARS	REQUIRED	REQUIRED
2	\$\$	OR			
3	\$\$\$	GROUND-FLOOR CONDO			

OVERVIEW

A dry well is an underground structure or hole that collects excess stormwater runoff, letting it slowly filter back into the ground. Dry wells collect stormwater runoff from gutter downspouts, roof valleys, and other areas where water concentrates and flows. They help infiltrate runoff and reduce erosion.

HOW COULD THIS HELP?

Dry wells control erosive runoff on and off your property and reduce overall wear on your house by minimizing backslash. Also, they contain oxygen which aids in health of your landscape.

MATERIALS & CONSIDERATIONS

Required: measuring tape, shovel, crushed stone, non-woven geotextile fabric (not pictured)

Optional: perforated, open-bottom plastic barrel, gutter downspout extension (Image)

Considerations for Installation:

- Call 811 or 800-272-1000 before you dig.
- Research the system and installation.
- Test your property to ensure a dry well system will work on your lot.
- Dig 15 feet away from foundation.



Image: Roger Cook and Ryan Beryl, n.d.

MAINTENANCE

Inspect each season and after large storms, check for clogging or water backup. Filter fabric will extend the life of the dry well, but will clog over time. If this occurs, remove and wash or replace stone and fabric. Care for and maintain plants above dry well, if applicable.

RESOURCES

- [New Hampshire Homeowner's Guide to Stormwater Management](#)
- [How to Install a Dry Well by Roger Cook](#)

SUMMARY OF STRATEGIES



Maintain Indoor & Outdoor Infrastructure

Flood Reduction Strategy	Description	Type of Flooding Addressed	Where Could This Be Implemented?	Contractor(s) Needed?	Permit(s) Needed?
Scope/Send Camera Down the Sewer Lateral	Hire a licensed plumber to locate blockage in your sewer lateral.	Backflow	All properties	Y	N
Tree Root Tracing and Removal	Hire a landscape specialist to locate and remove problematic tree roots that may grow into piping, foundations, or house walls.	Backflow, Leaks	All properties	Y	Y
Repair or Replace Malfunctioning House Connection Piping	Turn off all water supply for your home and check your meter. If there is a leak, simply tighten the nuts and bolts on the fixture itself to resolve the problem or replace the piping.	Backflow	All properties	Varies	Varies
Repair or Replace Defective and/or Leaking Plumbing Fixtures	Identify defective and/or leaking plumbing fixtures and if required, replace with low-flow fixtures to conserve water and save money.	Backflow, Leaks	All properties	N	N
Repair or Replace Lateral House Connection	Pipes can be repaired with pipe lining or by feeding a cone shape through the existing lateral line.	Backflow, Leaks	All properties	Y	Y
Repair or Replace Collapsed House Traps	Repair or replace the small trap of the main connection and each individual plumbing fixture.	Backflow	All properties	Y	Y

SUMMARY OF STRATEGIES



Floodproofing Strategies: Prevent Flooding

Flood Reduction Strategy	Description	Type of Flooding Addressed	Where Could This Be Implemented?	Contractor(s) Needed?	Permit(s) Needed?
Flood Barrier System	Includes sandbags and sand-filled systems; flood planks, shields, and barrier panels; and barriers, floodwalls, and point-of-use.	Stormwater	Depends on the structure and temporary use	Varies	Varies
Seal Openings	Includes installing waterproof windows and doors amid sealing basement slabs.	Stormwater	All Properties	Y	Y
Perimeter or Basement Drainage	Includes internal and exterior French drains.	Groundwater, Stormwater	All properties, but not recommended by NHTSA	Y	Y
Sump Pumps	A sump pump defends against basement seepage by drawing in groundwater from the basement and directing it away from your home through drainage pipes.	Groundwater, Stormwater	All bottom floor units, single-family homes	Y	Y
Check Valves	Check valves only allow fluid to flow in one direction. They are fitted to prevent flow in the wrong direction caused by certain pressure conditions.	Backflow	All bottom floor units, single-family homes	Y	Y
Ejector Pump	The purpose of an ejector pump is to remove sewage from your home, different from a sump pump which removes excess water.	Backflow	All bottom floor units, single-family homes	Y	Y

SUMMARY OF STRATEGIES



Flood-Resistant Construction Strategies: Lessen the Effects of Flooding

Flood Reduction Strategy	Description	Type of Flooding Addressed	Where Could This Be Implemented?	Contractor(s) Needed?	Permit(s) Needed?
Water-Resistant Materials	Materials that are not damaged by water inundation and dry easily after getting wet.	All	All properties	Varies	Varies
Install Flood Alert System	Detects water in the home and alerts residents to these conditions.	All	All properties	N	N
Anchor Fuel Tanks	All tubes should be above the 100-year flood level or surrounded by watertight floodwalls.	All	All properties	N	N
Floodproof Equipment	Use reusable flood covers to protect critical equipment that cannot be elevated.	All	All properties	N	N
Elevate Equipment	Elevate utilities and their related equipment above the BFE. If utilities are outside the home, they should be anchored to a platform that is attached at on one side to the main structure.	All	All properties	Y	Y
Flood Vents	Openings in the foundation wall located below the BFE to allow for water to automatically flow in and out.	Stormwater	Properties with non-living space on bottom level/ in the floodplain	Y	Y
Raise Cellar or Basement Floor above DFE	Elevate the lowest floor above the BFE; depending on the height of the BFE and height of floods, may require elevating all the floors.	Stormwater, Groundwater	Properties with non-living space on bottom level/in the floodplain	Y	Y
Fill in Cellar or Basement	Fill in a cellar or basement that is located below the BFE. If any of the basement wall remains above ground level, homeowners must install flood vents.	Stormwater, Groundwater	Properties with non-living space on bottom level/in the floodplain	Y	Y

SUMMARY OF STRATEGIES



Alleviate the Burden on the Sanitary System: Reduce Water Use & Stormwater Runoff

Flood Reduction Strategy	Description	Type of Flooding Addressed	Where Could This Be Implemented?	Contractor(s) Needed?	Permit(s) Needed?
Disconnect or Redirect Downspouts Away from CSO	External downspouts lead from a roof gutter, down the side of your home, then discharge onto your property or into the CSO.	Backflow	Homes with external downspouts	N	N
Disconnect Sump Pump from CSO	Disconnect sump pump from CSO and drain into a cistern, rain barrel, garden or green space, or planter box, as this gives stormwater a chance to infiltrate slowly before entering and overwhelming the CSO.	Backflow	All properties	N	N
Retain Stormwater	Retain stormwater through a rain barrel, rain cistern, retention wells, dry wells, a green roof, and/or a blue roof.	Backflow, Stormwater	Any property with yard or roof space	Varies	Varies
Decrease Stormwater Runoff	Decrease stormwater runoff with pervious walkways, patios, paving; green roofs, bio-infiltration (rain gardens & bioswales); and downspout planters.	Backflow, Stormwater	All properties	Varies	Varies

PERMITTING & APPROVALS

- **Construction Permits**
 - *Zoning permit*
 - *Building Subcode*
 - *Fire Protection Subcode*
 - *Plumbing Subcode*
 - *Electrical Subcode*
- **Floodplain Permit**
- **Historic Preservation Commission Approval**
- **Tree Permits**
- **Street & Sidewalk Openings Permit**
- **Hudson County Road Permit**



THANK YOU!

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ONLINE SURVEY:

<https://arcg.is/188GCP>

Open until June 20th



**Resilient Building Design
Guidelines Addendum will
be released in July**



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