



Hoboken Resilient Buildings Workshop

Wallace School

October 25, 2016

Agenda

Opening Remarks	6:30 PM – 6:35 PM
Hoboken Resilient Building Design Guidelines Presentation	6:35 PM – 6:50 PM
Flood Insurance Savings Presentation	6:55 PM – 7:05 PM
“Around the Room” Presentations by Open House Vendors (2 minutes per vendor)	7:05 PM – 7:30 PM
Flood Protection Open House Individual Elevation Certificate Reviews	7:30 PM – 8:30 PM

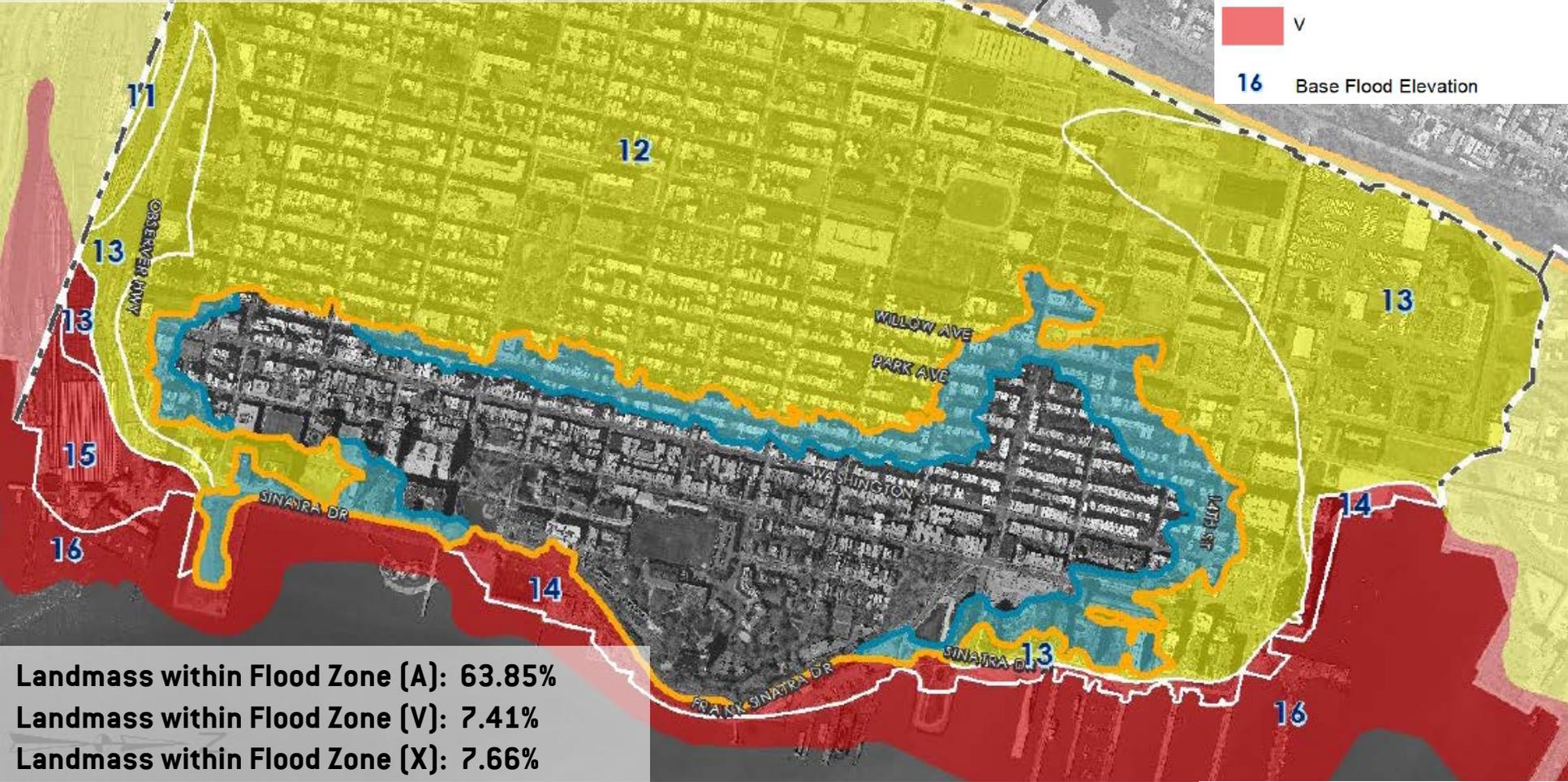
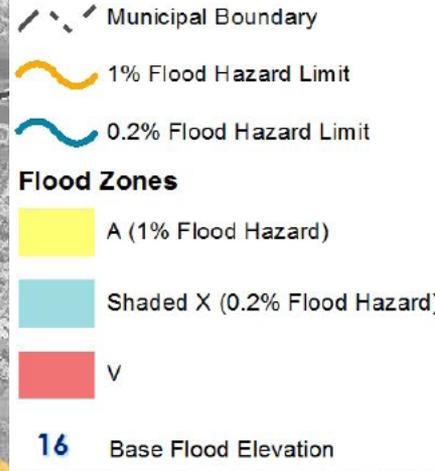


Comprehensive Flood Protection Strategy for Hoboken

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Hoboken's Flood Risk



Landmass within Flood Zone (A): 63.85%
Landmass within Flood Zone (V): 7.41%
Landmass within Flood Zone (X): 7.66%
Hoboken NFIP Total Liability: \$1,922,187,500
Hoboken NFIP Annual Premiums: \$5,984,720

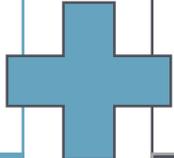
ABFE Maps, 1/28/2013. Elevation NAVD88.



Reducing Our Flood Risk

- Resilient Building Design Guidelines
- Flood Protection Workshops
- Flood Damage Prevention Ordinance
- Infrastructure Trust Fund

Individual Flood Protection



- Rebuild by Design Hudson River
- Northwest Park, Southwest Park, 7th & Jackson Park
- H1 and H5 Pump Stations
- Green Infrastructure Strategic Plan
- Washington Street Redesign Green Infrastructure
- City Hall Green Infrastructure Project

Community Flood Protection



*"If we are to learn anything from Superstorm Sandy, it is that the fabric of our city must be built back **stronger and more resilient**, and we must **make smarter development choices.**"*

- Mayor Dawn Zimmer

Resilient Building Design Guidelines

Floodplain
Development
Permitting
Process

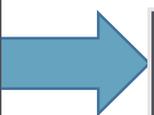
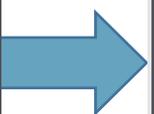
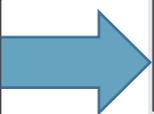
Design
Standards &
Guidelines

References
and
Resources

Do you need a floodplain permit?

What is your Zone?

Building Located in Special Flood Hazard Area
(A, V, X Shaded Zones)



What are you Building?

Rehabilitation

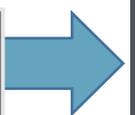
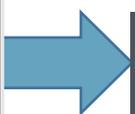
- Minor Repairs
- < 50% of the value of the building

Substantial Improvement

- Major Repairs and Renovation
- ≥ 50% of the value of the building

New Construction

- 100% of the value of the building



Do you need a floodplain development permit?

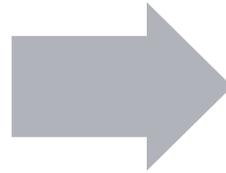
Requires Floodplain Permit

Note: Zoning Certificate, State Permits and other permits/approvals may be required.

What is your Design Flood Elevation (DFE)?

What is your Base Flood Elevation (BFE)?

- Regulated flood zone according to 2013 ABFE maps
- Elevation of the 1% Annual Storm Event



What is your Design Flood Elevation (DFE)?

- Elevation to which construction is regulated in Hoboken
- $DFE = BFE + \text{Freeboard}$

Designing Below the Design Flood Elevation (DFE)

Residential Uses	Commercial Uses	Other Acceptable Uses	Enclosures	Emergency Exits and Stairways
<ul style="list-style-type: none">• No new residential units are allowed• Existing units may remain until a substantial improvement is made	<ul style="list-style-type: none">• Must be dry flood-proofed• Must obtain flood-proofing certificate	<ul style="list-style-type: none">• Parking• Building Access• Storage	<ul style="list-style-type: none">• Floor must be raised to lowest adjacent grade• Must use flood resistant materials• Must have flood vents• No bathrooms, plumbing, or appliances allowed• Must flood-proof utilities	<ul style="list-style-type: none">• Must open at grade• Must be flood-proofed• Must have flood vents

Rehabilitation

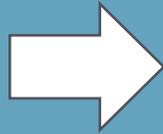
- Use Flood Resistant Building Materials below DFE.
- Locate all new or replacement utility connections at or above DFE.
- Locate all new mechanical equipment above DFE.
- Install backflow prevention measures on new and replacement sewer lines.

Retrofits

- Eliminate below grade crawl spaces and dwelling units.
- Elevate lowest enclosed area at or above lowest adjacent grade on at least one side of the building.
- Install flood vents in enclosed area.
- Install drainage collection systems and sump pumps.
- Reinforce walls to withstand floodwater pressures and debris impact.
- Commercial properties: dry flood-proof commercial space to DFE, and obtain a flood-proofing certificate.

Success Story: Residential Retrofit

132 Jackson Street
4-Unit Condo Building
Flood Insurance Premium
\$14,000



Elevated enclosure floor by 17 in.
Installed flood vents
Flood Insurance Premium
\$2,000 (85% Reduction)



Substantial Improvement and New Construction

- Elevate lowest floor to DFE, but do not use fill.
- Use Flood Resistant Building Materials below DFE.
- Locate all new utility connections at or above DFE.
- Locate all new mechanical equipment above DFE.
- Install backflow prevention measures on new sewer lines.
- Use enclosed area below DFE for parking, building access, or storage; with proper flood vents and reinforced walls.
- Commercial properties: use area below DFE for commercial space, as long as it is dry flood-proofed.

Resilient Building Design Features



Foundation Design



Mechanical Systems and Utilities



Elevators



Wet Flood-proofing



Dry Flood-proofing



Flood Resistant Materials



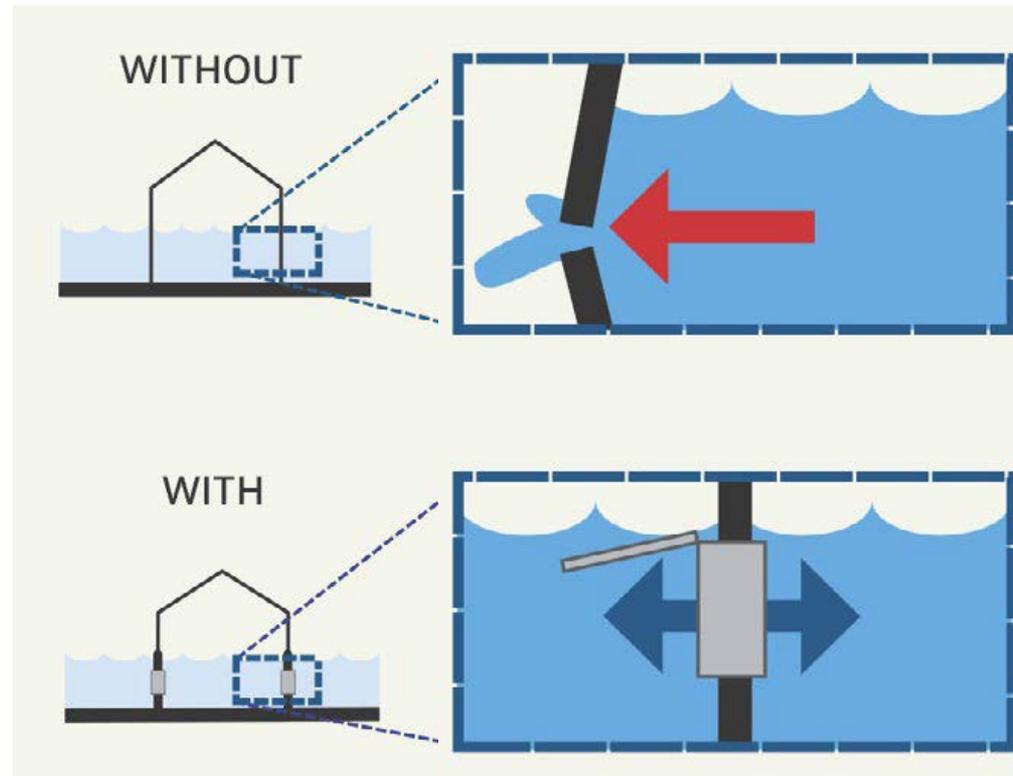
Streetscape



Parking

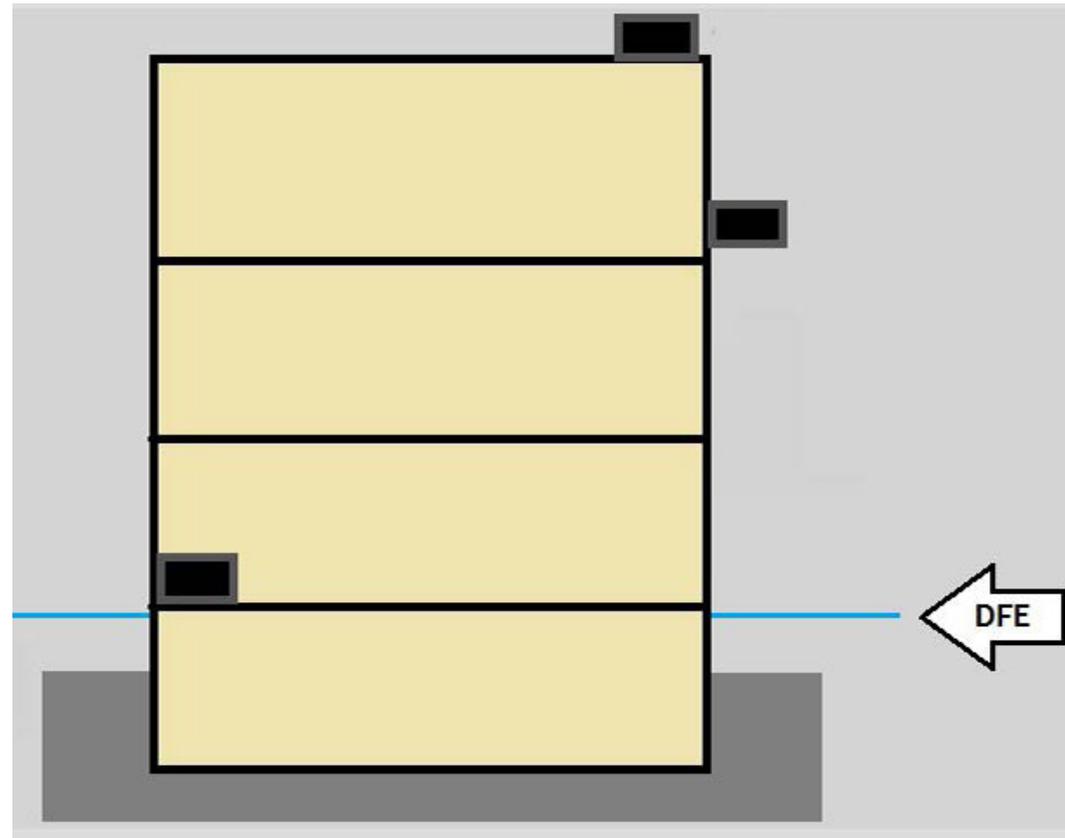
Foundation Design

- Use pilings and footings.
- Do not use fill to elevate.
- Install flood openings in any enclosure that is below the DFE, but above grade.
- Elevate cellar or crawl space to lowest adjacent grade to the building.



Mechanical Systems and Utilities

- Locate utility connections and mechanical equipment above the DFE.
- If outside the building, utilities should be anchored.
- If the utilities cannot be relocated, put a flood-proof barrier around them.



Mechanical Systems and Utilities



Relocate

- Move external equipment to the roof.
- Relocate internal equipment to higher floors.
- Build an additional equipment room above DFE.
- Replace multi-unit systems with smaller on-demand systems within individual units.
- Remove fuel tanks if heating systems are replaced with a natural gas system.
- Consider clearance and venting requirements before relocating.



Elevate

- In areas below the DFE, raise internal equipment as high as possible.
- Place external equipment on platforms above the DFE.
- Equipment must be anchored against wind.



Flood-proof

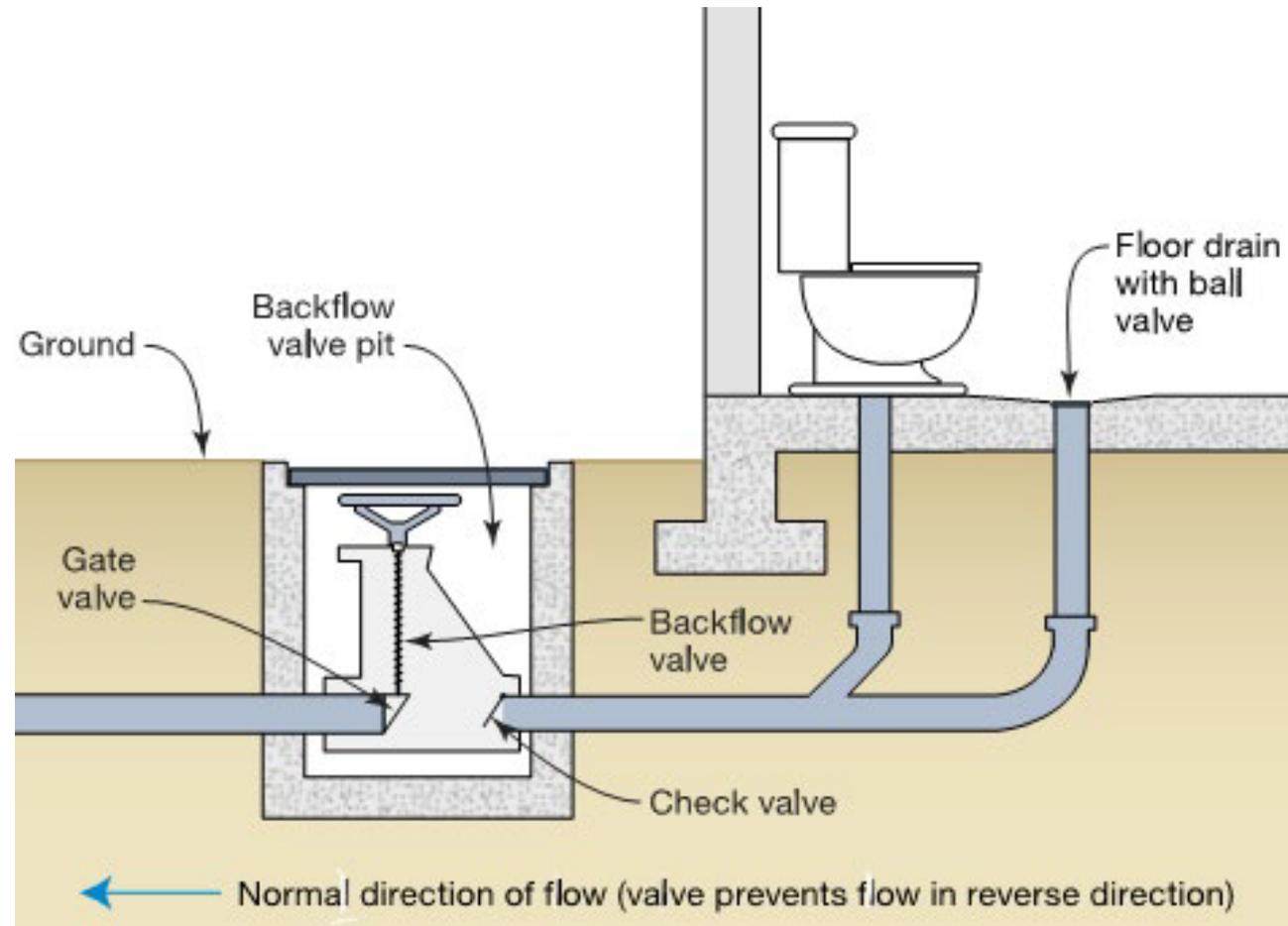
- Mechanical equipment in non-residential buildings MAY be located inside barriers that are designed to resist flood loads and keep floodwaters away from the equipment.
- In new construction, however, elevation of mechanical equipment provides a higher level of protection and is preferable.

Electrical

- Locate electrical equipment above DFE, (outlets, meters, panels, disconnects, panels, switch gear, and transformers).
- Install backup power source (generator or battery backup).
- When replacing electrical wiring below DFE, run wires down from ceiling instead of along the floor and mount conduits on walls.
- Isolate utility connections vulnerable to flooding from the building's electrical system.

Water and Sewer Pipes

- Prevent entry of floodwaters into pipes.
- Install backflow prevention valves on sewer pipes and floor drains.



Elevators and Lifts

- Locate motors, elevator controls, and hydraulic pumps above the DFE.
- Design cabs and shafts to resist flood loads and constructed of flood-resistant materials.
- Use float switches to avoid sending cabs to areas below the DFE during a flood.
- Refer to FEMA's Technical Bulletin 4: Elevator Installation for Buildings Located in SFHAs.

Flood Resistant Materials

Yes! USE these materials

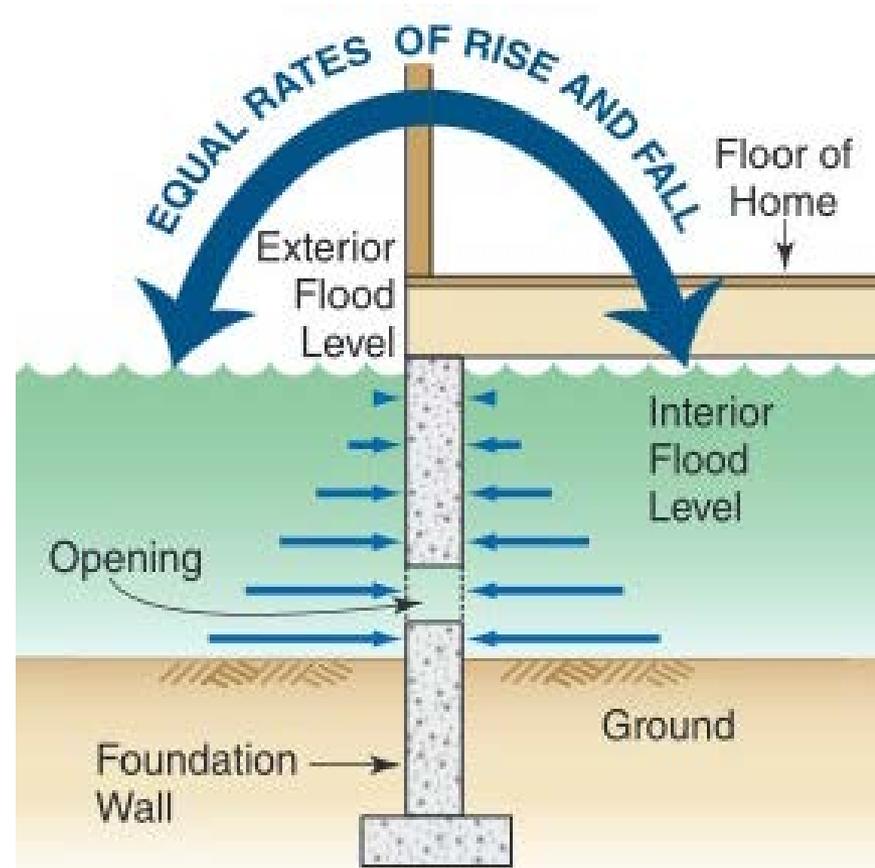
- Concrete and steel
- Specially treated, decay-resistant lumber
- Marine grade plywood
- Ceramic, porcelain or clay tiles
- Terrazzo tiles
- Vinyl tile or sheets
- Aluminum studs
- Cement board
- Paperless gypsum board
- Glass
- PVC
- Latex or epoxy paint
- Closed cell insulation

No! DON'T use these materials

- Engineer wood
- Laminate flooring
- Oriented strand board
- Carpeting
- Wood flooring
- Cork
- Paper-faced gypsum board
- Particle Board
- Non-latex Paint
- Fiberglass insulation

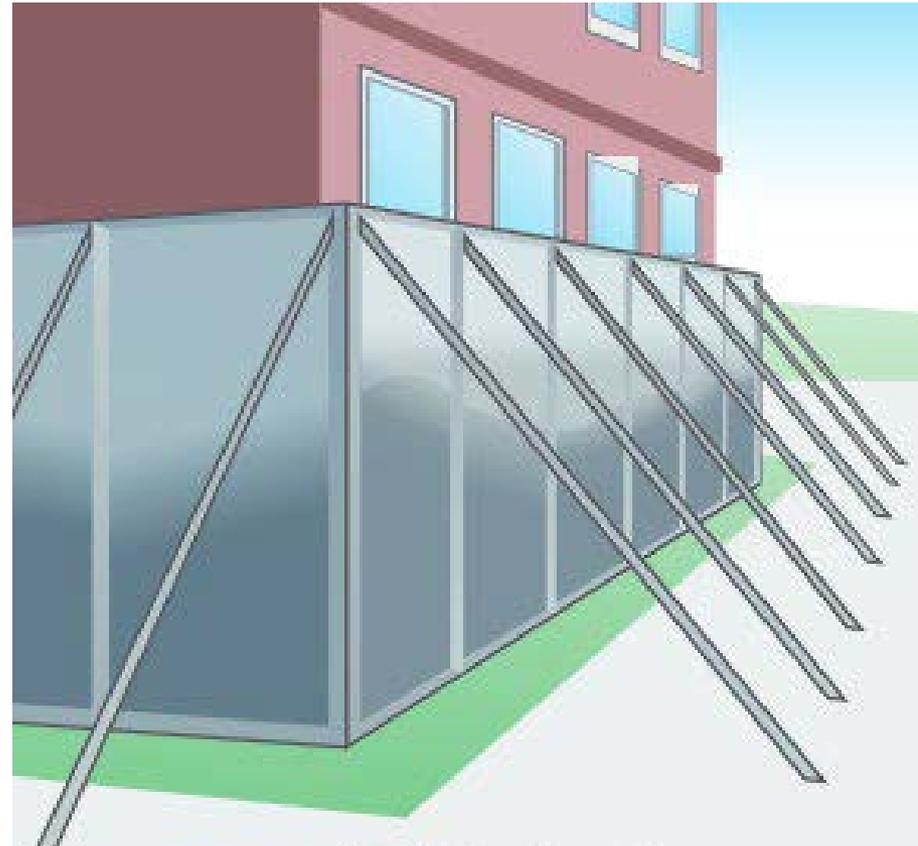
Wet Flood-proofing

- Use flood resistant materials below DFE.
- Allow automatic inflow and outflow of flood waters using vents
 - Number of vents based on floor area
 - Install vents on 2 walls
 - Install vents with bottom at 1 ft. above ground



Dry Flood-proofing

- Use dry flood-proofing for non-residential uses and provide the required FEMA Flood-proofing Certificate.
- Dry flood-proofing for residential uses will reduce flood risk, but will not reduce flood insurance.
- Automatic or “passive” flood-proofing measures are preferred.



Parking and Streetscape

- Parking, access and storage are allowed below DFE, but must use flood-resistant materials.
- Use dry flood-proofed commercial spaces to envelope parking in new buildings to protect the streetscape.
- Recess garage walls to reduce impact on streetscape.
- Use windows consistent with the pattern on floors above.
- Use planting beds, rain gardens or green wall systems to soften design along streetscape.

Questions? Contact us!

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Flood Protection Open House

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