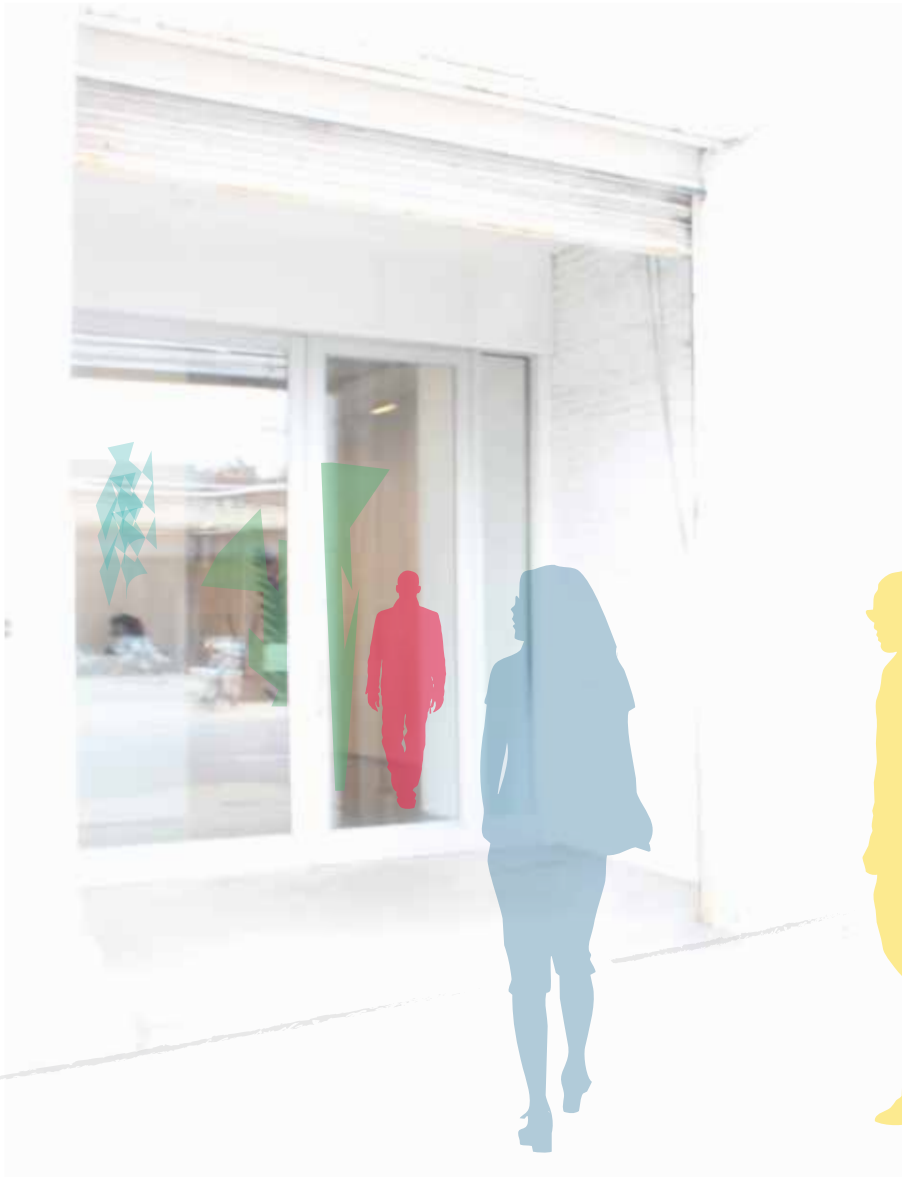



resilient art spaces





This study was funded through the *U.S. Department of Housing and Urban Development (HUD)* Community Development Block Grant Disaster Recovery Program (CDBG-DR), as part of the *New York City Department of City Planning's* Resilient Neighborhoods Initiative.



resilient **art spaces**

THE CITY OF NEW YORK

Mayor Bill De Blasio

DEPARTMENT OF CITY PLANNING

Carl Weisbrod, Director

OCTOBER 2015

www.nyc.gov/resilientneighborhoods



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Mayor's Office of
Recovery & Resiliency

NYC

Emergency
Management

NYC
Small Business
Services



Introduction

New York City continues to maintain a competitive edge in the creative sector serving as home to more of the nation's creative jobs than any other U.S. city. New York is an established cultural destination with the world's foremost theaters, arts schools, museums, dance and music companies, publishers, creative firms and, equally importantly, burgeoning artist communities. Despite these strengths, there are industry-wide challenges faced by arts-related businesses that must be dealt with directly to reinforce New York's creative vitality.

In 2012, Hurricane Sandy caused an estimated \$200 to \$300 million in losses from damage to artwork. West Chelsea, New York's largest gallery district with almost 300 galleries, was among the hardest hit arts communities. Art galleries, museums, and storefronts located in the floodplain are immediately affected by a storm. These spaces rely on a ground-level, engaging street presence that encourages visitors to easily meander from venue to venue. This reliance on a location at grade is also what makes these businesses especially vulnerable to damage from a flood or other natural disasters.

This guide is part of the Resilient Neighborhoods initiative by the Department of City Planning. The initiative seeks to identify neighborhood-specific strategies to support the vitality and resiliency of communities in the flood zone. The guide has been produced in coordination with the Mayor's Office of Recovery and Resiliency, and the New York City Departments of Cultural Affairs, Emergency Management, and Small Business Services.

The Department of City Planning interviewed staff members at 60 West Chelsea galleries to better understand their operations, needs, and experiences during Hurricane Sandy as well as their plans for the future. The information generously shared by participating organizations has informed this document, which provides guidance and resources to a spectrum of arts-related businesses in the floodplain to plan for, mitigate, and recover from storm surge and flooding. While this guide focuses on steps that can reduce damage and disruption from flooding, some of the preparedness measures can be broadly applied to reduce vulnerability to other hazards as well.

As the creative sector evolves, neighborhoods change, and e-commerce becomes more prevalent, it is imperative that the city's arts communities have the tools to remain strong and flourish.

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Glossary



Why be prepared?

Art galleries in flood-prone areas have unique vulnerabilities that create challenges for mitigating flood risk. Planning for emergencies and implementing adaptation strategies that minimize exposure to coastal flooding and storm surge, as well as other natural disasters, can ensure that street-level businesses, such as galleries, are able to recover and resume operations more quickly.

New York City and the arts

Many of New York City's numerous art spaces occupy repurposed 20th century lofts and warehouses along the waterfront and were severely impacted by flooding during Hurricane Sandy. Art galleries experienced tremendous losses including significant water damage to artwork, extensive damage to spaces and contents, loss of vital records and files, and business interruption.

There are approximately 1,400 galleries in New York City. Many of these, almost a quarter, are concentrated in flood-prone neighborhoods including West Chelsea, Bushwick, Williamsburg, and Red Hook. Galleries are an economic driver for the city's economy, and an important part of the communities where they are located.

Businesses with a street-level presence, which are sometimes below-grade or rely on below-grade spaces, are particularly susceptible to damage from flooding during storms. Many art spaces, such as galleries, studios, and other exhibition spaces, are located in these types of vulnerable conditions. With climate change, which is expected to increase the frequency and severity of coastal flood hazards, these vulnerabilities will become even more pronounced over time. Additionally, art spaces can also be impacted by other hazards such as fires, severe weather, power outages, and building collapses.

Adaptation and preparedness planning can help minimize damage to artwork and other vulnerable materials, while helping to reduce the time necessary to restore and reopen businesses.

This guide provides information on how to reduce flood risk for art spaces and offers examples of practical adaptation measures that can be employed at the gallery, building, and district-wide scales.



west
chelsea

UES

57th street

midtown

LIC

tribeca

SoHo

LES

greenpoint

bushwick

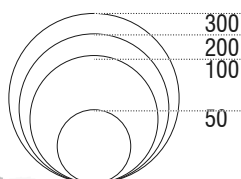
williamsburg

dumbo

redhook

gowanus

sunset park



No. of galleries

Source: galleriesofnewyork.com

Total
Within flood zone

FEMA flood zone
(V, A and X zones)

Determining your flood risk

The first step in identifying flood risk is assessing threats to life safety. Determine if your property is in a hurricane evacuation zone at NYC.gov/knowyourzone. Enroll for emergency alerts at notifyNYC.

1

2

3

4

5

6

Hurricane Evacuation Zones

In addition to life safety, evaluating potential flood damage and insurance against that damage is an essential element of risk assessment. FEMA's Flood Insurance Rate Maps (FIRMs) are the federal government's official assessment of flood risk. The FIRMs indicate the depth and extent of expected flooding. Visit region2coastal.com, msc.fema.gov & floodhelpNY.org for additional guidance.

V
zone

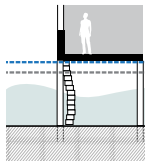
A
zone

X
zone

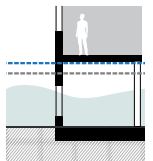
FIRM Flood Zones

Typical retrofit strategies for properties located in the V, A, or X Flood Zones include, but are not limited to:

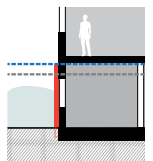
Elevating a building is accomplished by lifting the existing structure or by relocating the lowest floor to above the anticipated flood level if the floor to ceiling height is sufficient.



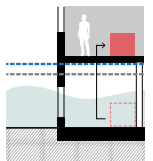
Wet floodproofing involves retrofitting a building to allow floodwaters to enter and exit the building and limits potential damage to the structure and finishes.



Dry floodproofing involves making a building, or an area within a building, substantially impermeable to the passage of water.



Relocating or floodproofing electrical, mechanical, and plumbing system components and equipment involves moving these critical assets above anticipated flood levels to appropriate code requirements.

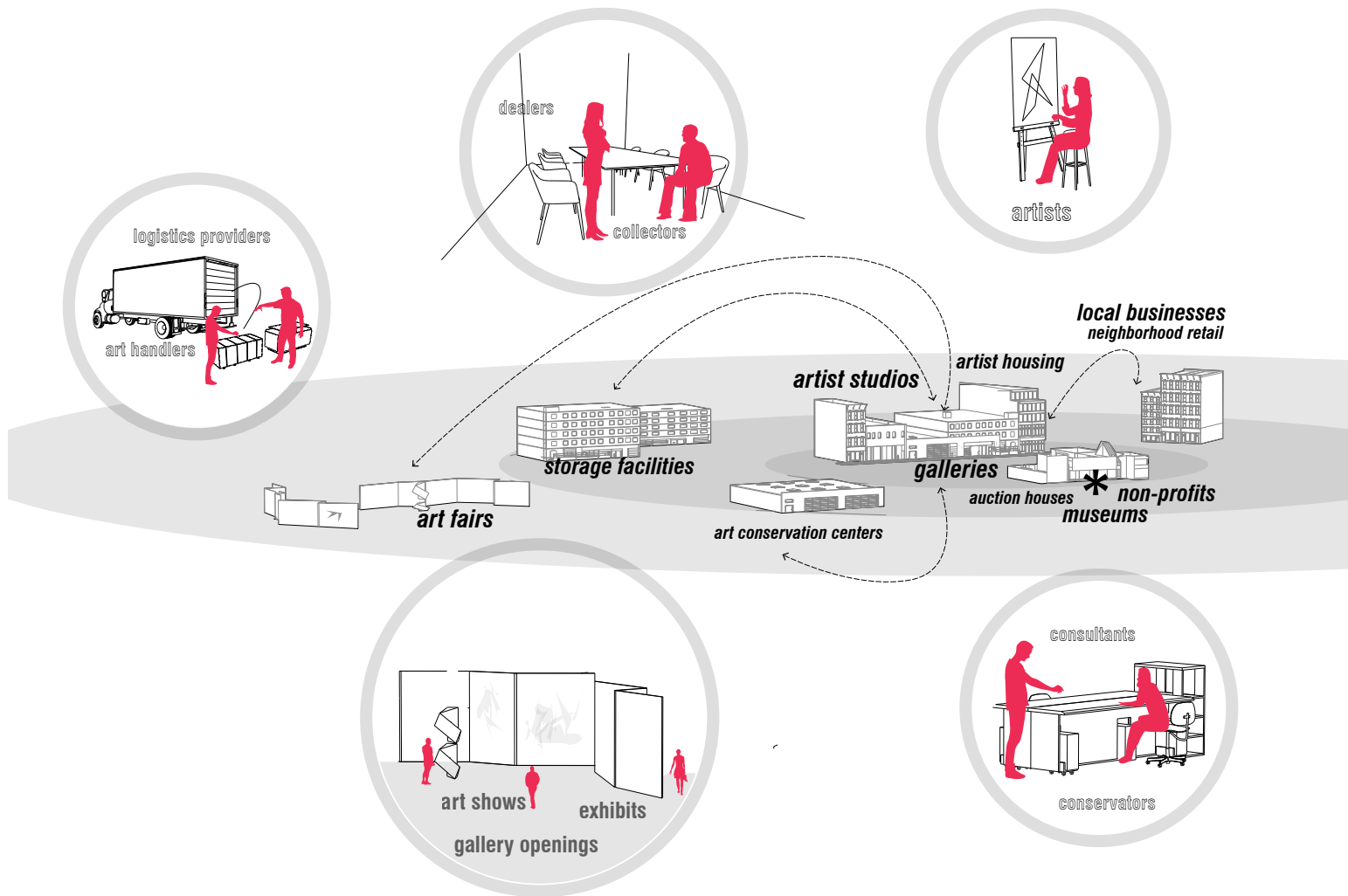


Design flood elevation (DFE), as defined by the New York City Building Code, is the minimum elevation to which a structure must be elevated or floodproofed.



An elevation certificate is required to make this calculation. Hire a licensed professional to determine the best option for retrofitting your property to reduce or eliminate the possibility of damage.

The Arts Ecosystem



Gallery districts in New York showcase a unique and wide-ranging collection of works by established and emerging artists. Adapted 20th century lofts, warehouses, and walk-ups are now sought-after locations to house a range of commercial and alternative art spaces.

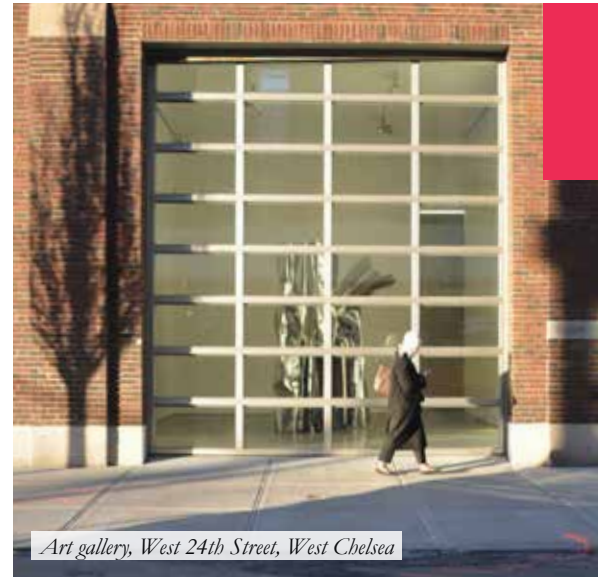
Arts organizations and related businesses include studios, commercial and non-profit galleries and museums, and supporting services such as fine-art storage, art supply stores, logistics providers, and art-handlers. Additional supporting uses include cultural destinations and businesses such as restaurants, cafes, bars, boutiques and parks. Gallery districts are formed when these entities cluster together, creating an ecosystem of uses and roles that is economically beneficial to all businesses and contributes to the ongoing vitality of the neighborhood.

These dynamic networks and relationships between the commercial and nonprofit sectors, as well as support services and local businesses, are vital resources in maintaining physical, economic and social resiliency.

Arts organizations, which are so critical to New York's cultural and economic diversity, have a great range of sizes and arrangements with regards to space and a distinct set of operational needs. Cultural districts are often characterized by a concentration of former industrial buildings, close to the water's edge, with structural qualities, such as open-floor plans, large windows and high ceilings, that are well suited to many of the entities that make up the creative ecosystem.

While this report focuses on the needs of the arts community, the adaptation measures described may also be applicable to other uses occupying similar building types including design studios, maker spaces, offices and retail.

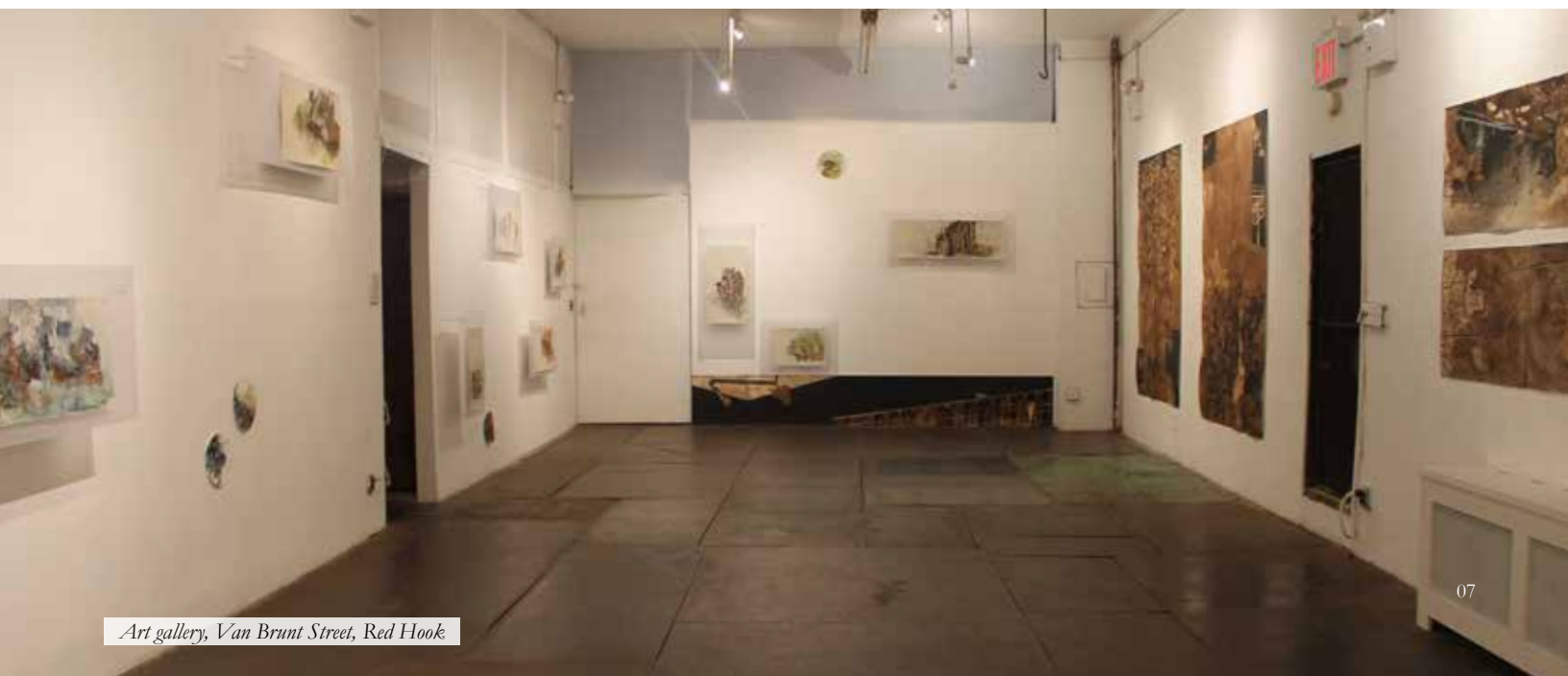
The following sections include specific recommendations at the gallery, building, and operational scale, providing a menu of options to identify vulnerabilities and build resilience.



Art gallery, West 24th Street, West Chelsea



Art gallery, West 20th Street, West Chelsea



Art gallery, Van Brunt Street, Red Hook

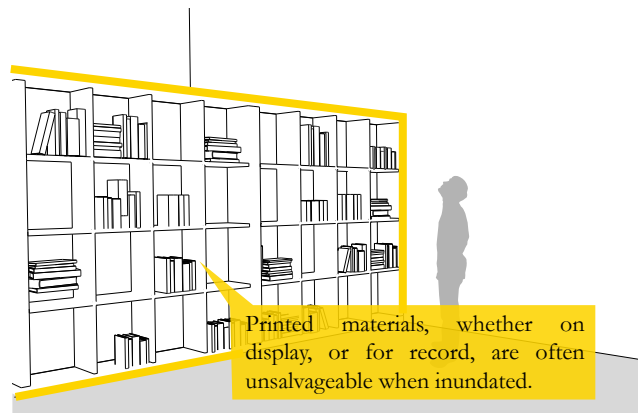
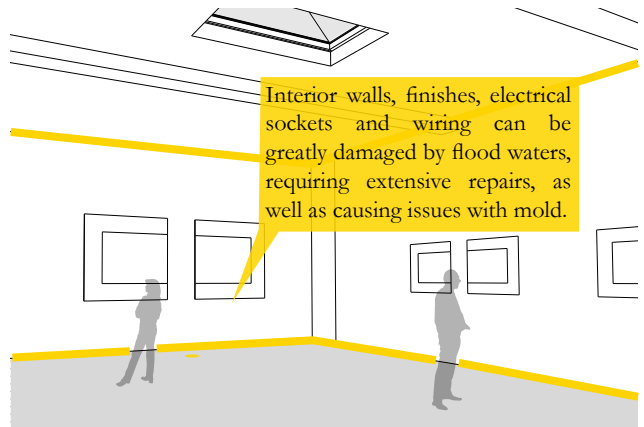
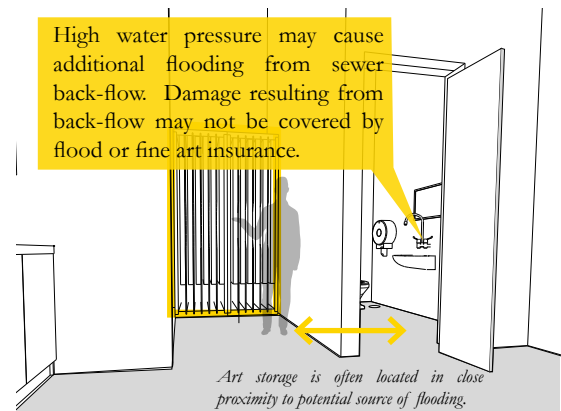
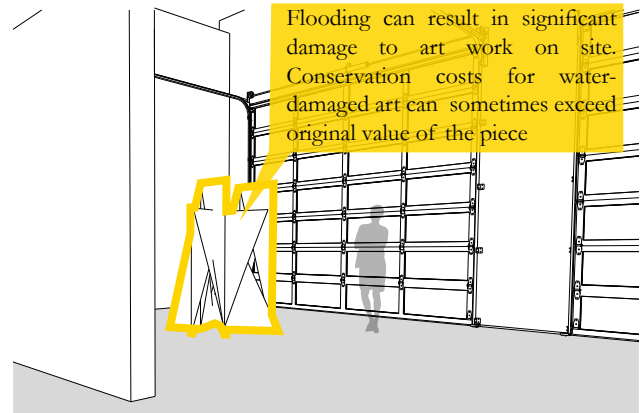
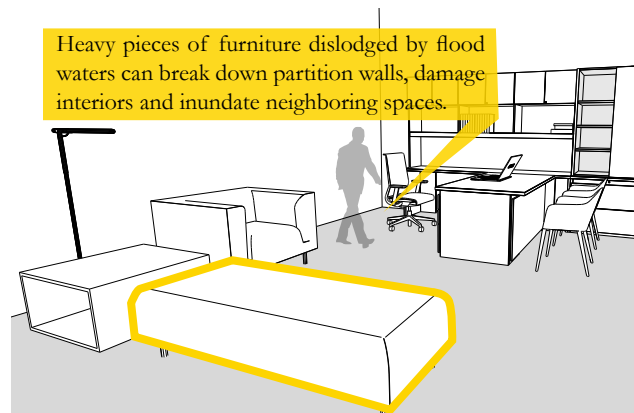
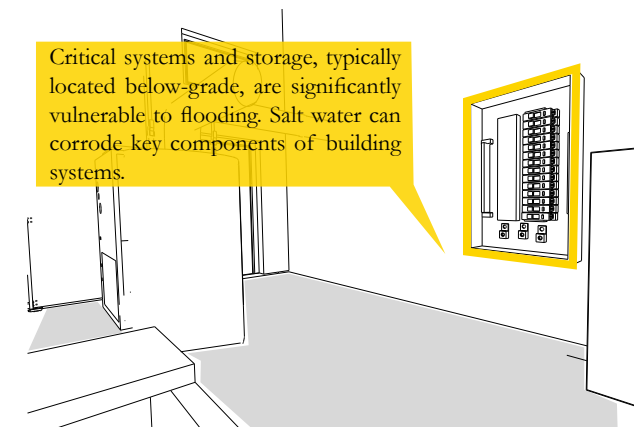
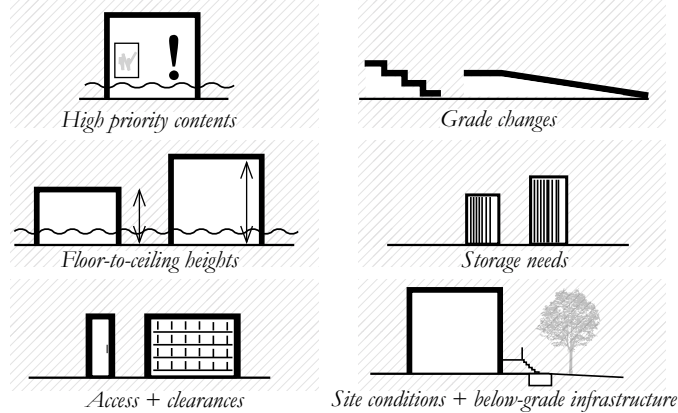
Protecting your gallery

The operational and spatial needs of art spaces pose unique resiliency challenges, but by implementing practical measures for adaptation, integrating flood resiliency into everyday operations, and having a plan in place to respond to emergencies, damage and disruption resulting from a flood event can be greatly reduced.



Identify what's at risk

Things to consider:



Mitigation Strategies

Understand insurance needs

Understand what your insurance policy covers. Consider expanding your insurance to include coverage for direct and indirect costs associated with a disaster. Examples of insurance against direct costs include hazard-specific property insurance (e.g., flooding or fire). Examples of insurance against indirect costs include business interruption or continuation insurance. Flood damage is not covered by a basic property insurance policy and should be covered by purchasing flood insurance. Most flood insurance is provided through the federal government's National Flood Insurance Program (NFIP).

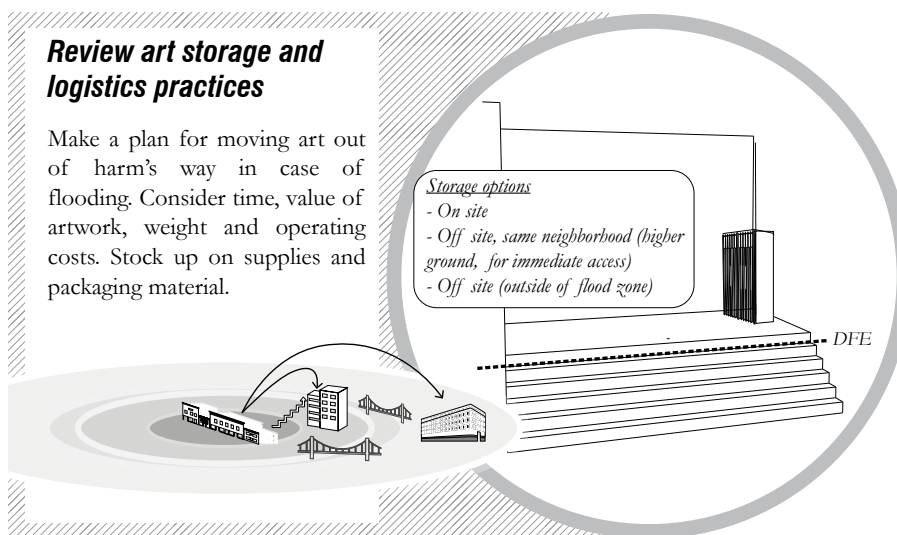
If you are located in a high-risk flood area and have a mortgage from a federally-regulated or insured lender, you are required to purchase a flood insurance policy. Coverage is limited in below-grade spaces and below the DFE regardless of flood zone or date of building construction. Value of artwork may exceed the contents coverage requirements necessitating purchase of supplemental insurance in the private markets. Make note of deductibles chosen and the amount of building and contents coverage. To learn more about flood insurance, visit NFIP's website, www.floodsmart.gov.

Clarify lease terms

Renters should contact the landlord to determine if the building has flood insurance. Check with your other insurers to see if this impacts other insurance policies (such as contents insurance or fine art insurance). When inspecting a possible rental property in a flood zone, ask about the damage from coastal storms and flooding. Be aware of rights and responsibilities when signing a tenancy agreement. Keep contact details up to date. Notify the landlord as soon as possible if any damage occurs and if any repairs are needed. Coordinate with the landlord and building management as necessary when making interior or structural improvements.

Review art storage and logistics practices

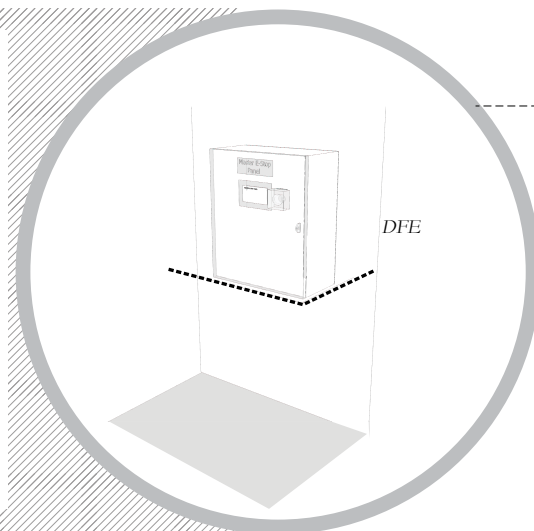
Make a plan for moving art out of harm's way in case of flooding. Consider time, value of artwork, weight and operating costs. Stock up on supplies and packaging material.



Elevate or protect critical systems in place

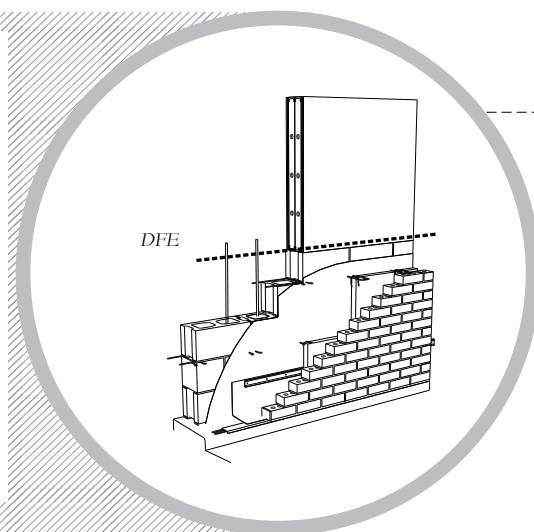
Elevate critical building systems to at or above the anticipated level of flooding. Raise electrical panels and outlets to at or above the DFE.

When relocating is not a feasible option, critical building systems can be encapsulated in a dry floodproofed enclosure, which may need to be fire-rated.

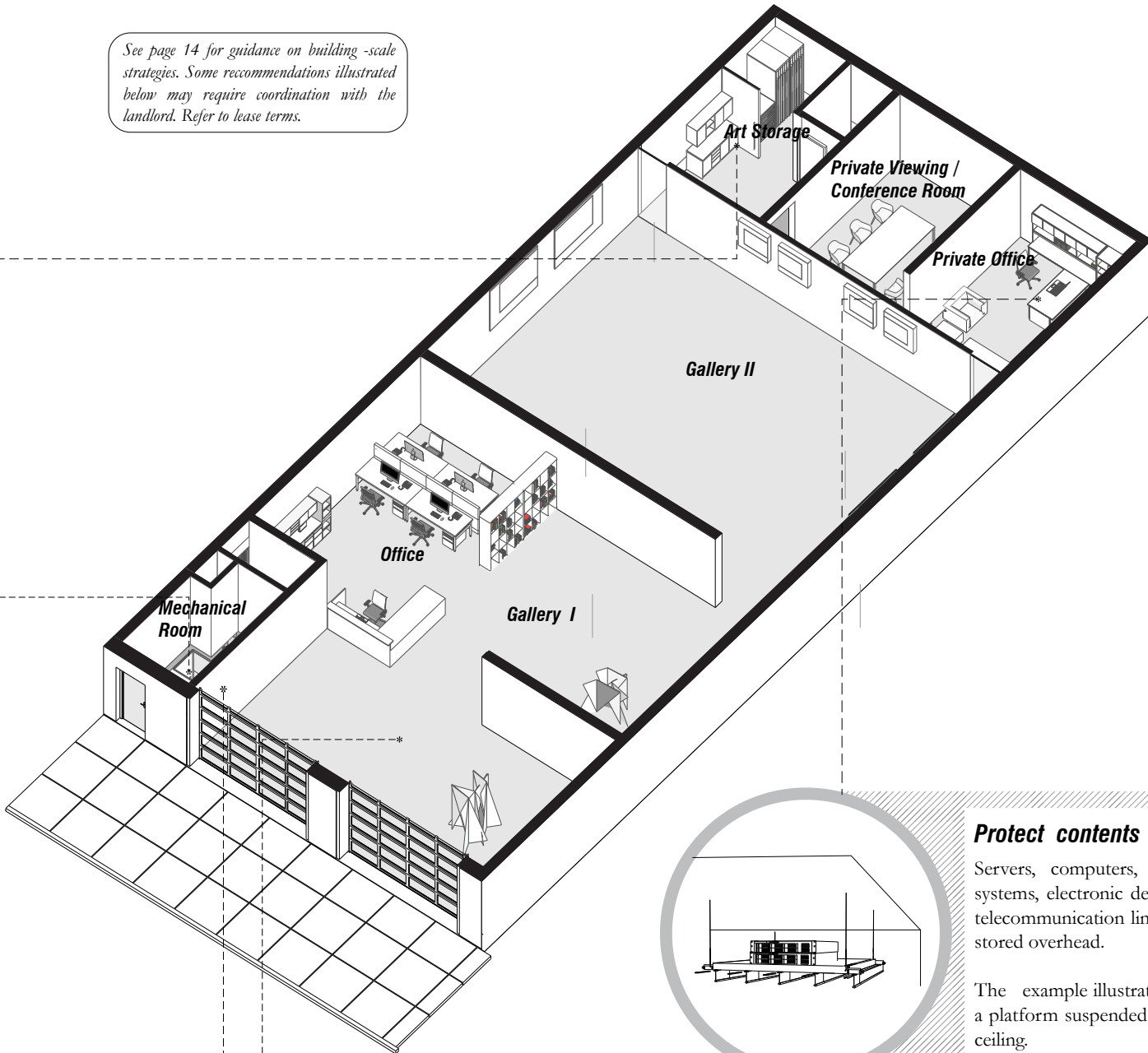


Use flood-damage resistant materials

Wall assembly (including interior walls) designed with flood damage resistant materials can survive with little or no damage. After a flood, it can be cleaned out and dried quickly enough to avoid decay and reduce mold growth. Walls may be constructed of flood-damage resistant materials (with reinforcement if dry floodproofing), at least up to the DFE as a means to reduce costs.



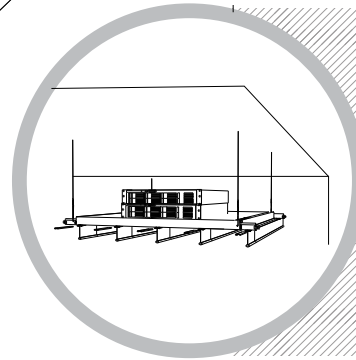
See page 14 for guidance on building-scale strategies. Some recommendations illustrated below may require coordination with the landlord. Refer to lease terms.



Protect contents

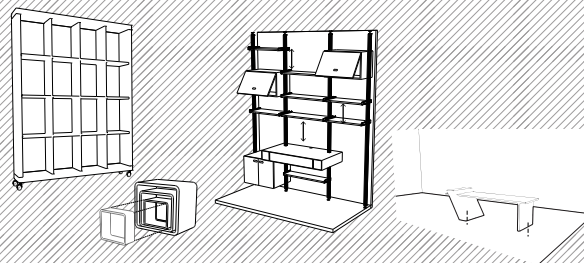
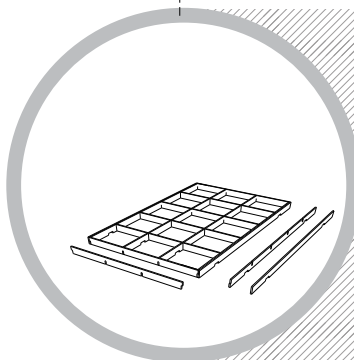
Servers, computers, back up systems, electronic devices and telecommunication lines can be stored overhead.

The example illustrated shows a platform suspended from the ceiling.



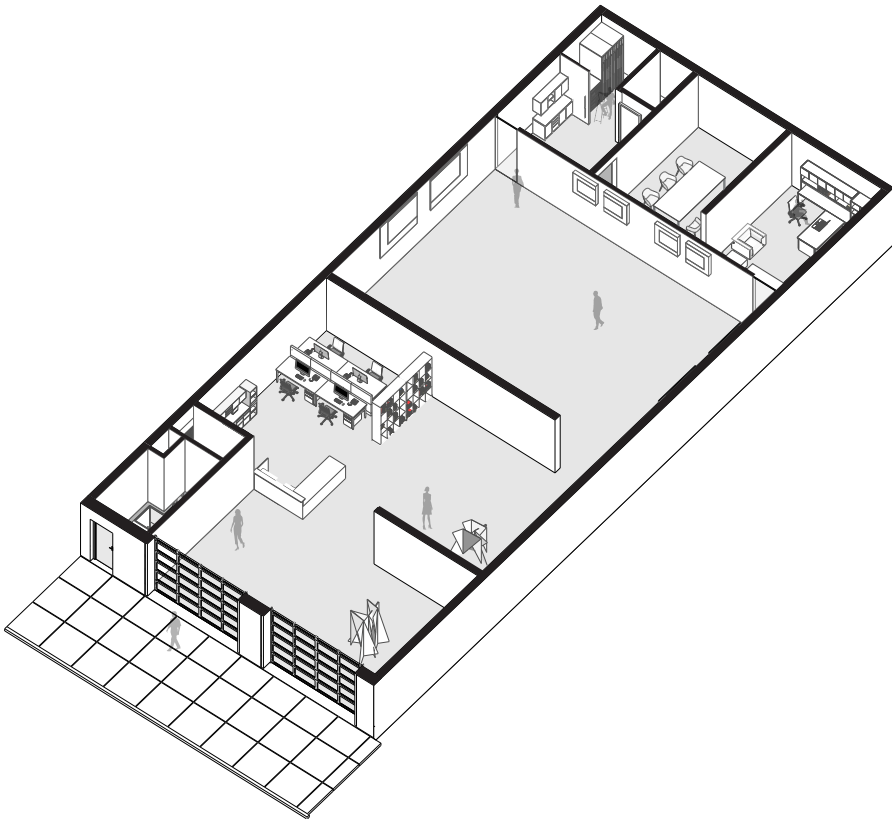
Plan for flexibility

Flexible furniture and storage solutions can facilitate quick and easy dismantling for relocation to higher ground areas or to a dry floodproofed enclosure.



Preparedness Strategies

Before the flood...



Develop a disaster preparedness plan.

- 1 Identify operations that are critical to business function and operations.** Review plan with staff and establish crisis back-up procedures.

- 2 Review options available to protect the building perimeter and coordinate with the landlord and building management. Prioritize protecting critical building systems. Install sewer backflow valves.**

- 3 Maintain accurate inventory of art work and other items on site. Build a regular cycle for updating the inventory into your work schedule.**

- 4 Keep a list of essential contacts:** art storage facilities, art transport companies, conservators, clients, art dealers, consultants and local contractors for emergency repair work.

- 5 Make sure you have copies of insurance information and important records stored in a waterproof and fireproof container. Keep extra copies off-site as a precaution.**

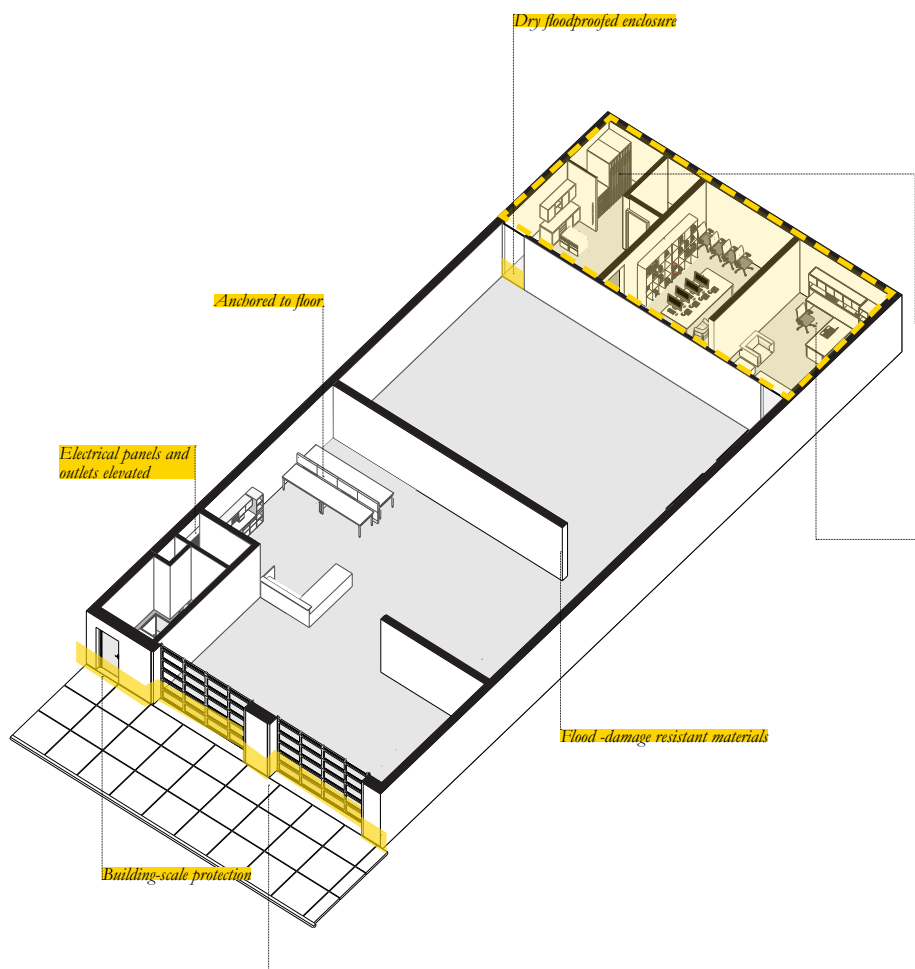
- 6 Arrange emergency transport/storage facilities.** Practice due diligence when hiring vendors. Confirm that the storage facility has a storm preparedness plan in place if also located in a flood zone.

- 7 During hurricane season, plan to show artwork that can be easily moved or relocated.**



It is critical that any artwork on-site be relocated and stored at a higher-ground location. It is not only the flood event that can affect artwork, but also the humidity in the space after a flood. Should art remain hanging on the walls, confirm the lower frame of each piece rests higher than the DFE. Arrange for generators to get the HVAC system and lights working as quickly as possible. Drying out the building faster if interiors are flooded will reduce the chance of mold.

Once a flood is predicted...



1 Tune in to radio, television or internet sources for weather alerts. Check for live updates on [notifyNYC](https://www.nyc.gov/site/nyc-emergency-management/nyc-emergency-management). When a flood warning is issued, implement disaster preparedness plan.

2 Contact logistics providers and art handlers in advance to move artwork. Consider any announced road or tunnel closings. Contact insurance agent and clients with works on consignment.

3 Elevate / protect in place any pieces that cannot be moved off-site. Take precautions to ensure that the artwork is not damaged.

4 Relocate or elevate and protect in place critical records, possessions and furniture. When left in place, anchor any heavy equipment or free-standing items to walls or floors.

5 Identify meeting place and time for all key employees in crisis management team. Plan in advance to work remotely in the event of a prolonged recovery process.

6 Install flood protection as necessary if a flood mitigation plan exists involving deployable barriers at the building-scale.

7 Follow life safety and evacuation procedures. Stay tuned to local news and media coverage.

After the flood...

Immediately following a flood, contact the insurance company by phone and in writing. Make a list of all property damaged or destroyed, take pictures, obtain repair estimates, keep a record of expenses and receipts for damaged items.

Resources

FEMA - [fema.gov/plan-prepare-mitigate](https://www.fema.gov/plan-prepare-mitigate)
NYC Department of City Planning - [nyc.gov/planning](https://www.nyc.gov/site/planning)
NYC Department of Buildings - [nyc.gov/buildings](https://www.nyc.gov/site/buildings)
NYC Emergency Management- [nyc.gov/emergency management](https://www.nyc.gov/site/emergency-management)
NYC Small Business Services- [nyc.gov/sbs](https://www.nyc.gov/site/sbs)

Protecting your building

In addition to meeting New York City Building Code requirements for floodproofing, property owners may voluntarily choose to modify their buildings to make them more flood-resilient. This will reduce their vulnerability to future floods, and potentially help to avoid higher flood insurance premiums.



To best understand a building's flood risk and opportunities for adaptation, identify the physical characteristics of the building and specific risks associated with it, the appropriate codes and regulations, as well as the construction methods best suited to protect the structure.

Identify your flood risk

To identify where in the floodplain your property lies, consult FEMA's Flood Insurance Rate Maps (FIRMs). Visit region2coastal.com and floodhelpNY.org for more information. The FIRMs show the Special Flood Hazard Area in the city where FEMA building standards apply.

Review relevant regulations

Appendix G of the New York City Building Code describes standards for flood-resistant construction in New York City. The requirements in Appendix G meet federal (FEMA) standards, and therefore allow property owners in New York City to purchase flood insurance provided by the federal government. Flood insurance is available through the National Flood Insurance Program (NFIP) and is required for properties with federally-backed or federally-regulated mortgages.

Identify flood mitigation options

Non-residential buildings with commercial uses such as art galleries have the option of elevating and wet floodproofing below the Design Flood Elevation, or dry floodproofing.

Wet floodproofing requires the use of construction materials that are not easily damaged by water and providing vents to allow flood waters to pass through building walls.

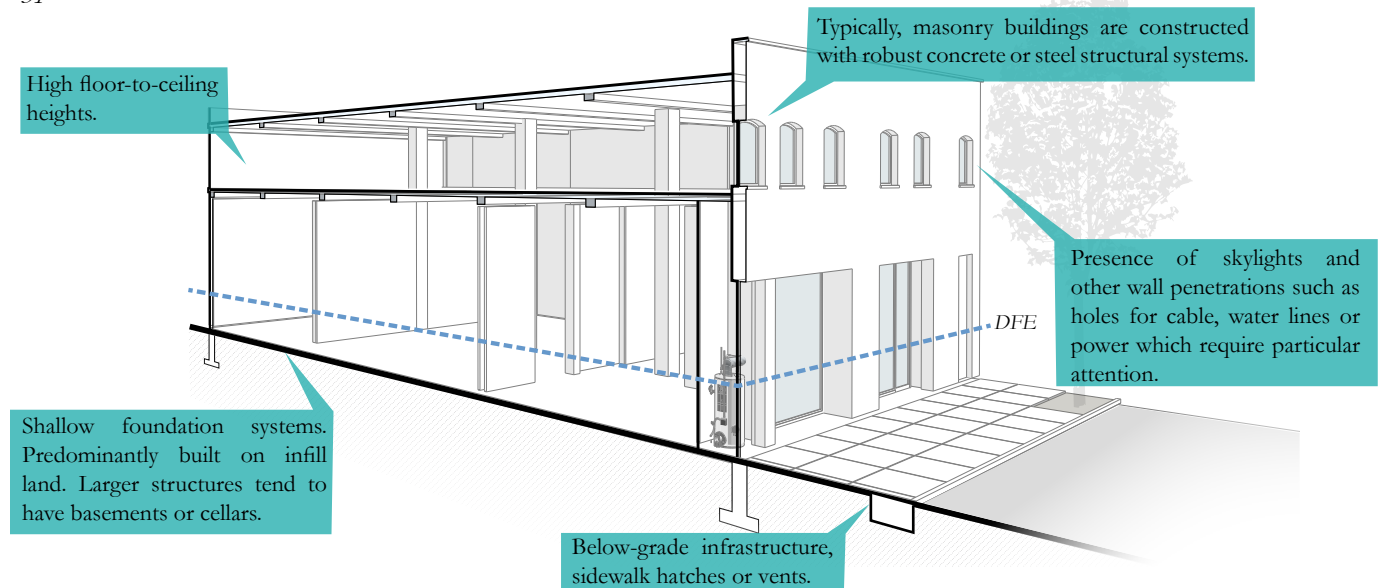
Dry floodproofing entails preventing water from entering the space for a sustained period of time. Techniques include deployable flood panels and shields to seal window and door openings. It is important to note that dry floodproofed buildings also need to be designed so that walls can resist the lateral pressure of water, and foundations and floor slabs can resist the force of buoyancy that occurs when a building is surrounded by water.

Design your strategy

One of the most important factors in identifying retrofitting strategies is to determine whether a building has been Substantially Damaged or Substantially Improved (see Glossary on Page 24). If the building falls within either of these definitions, it must comply with current flood resistant construction standards set forth in Appendix G, as well as other requirements of the New York City Building Code. If a building is not Substantially Damaged or Substantially Improved, in most cases, it has access to many more options for mitigation. However, these alternative strategies may not reduce flood insurance premiums and may not offer full protection.

For more information on retrofitting strategies refer to DCP's *Retrofitting Buildings For Flood Risk* at nyc.gov/retrofitting

Typical Built Characteristics



To fully comply...

Dry Floodproofing

Dry floodproofing commercial uses is in compliance with New York City Building Code and is a recognized measure under NFIP. This retrofit strategy may require significant structural reinforcement of the entire structure, as well as attention to structural reinforcement at the party-walls so as not to affect the neighboring property. Periodic maintenance is critical, as any alterations to the wall and floor systems must be waterproofed, pumps and backup power must be tested, and flood shield gaskets must be replaced regularly. Specific steps include:



Dry floodproof building below the DFE including all wall penetrations for utilities. Install deployable flood shields at building frontage and temporary egress stairs.



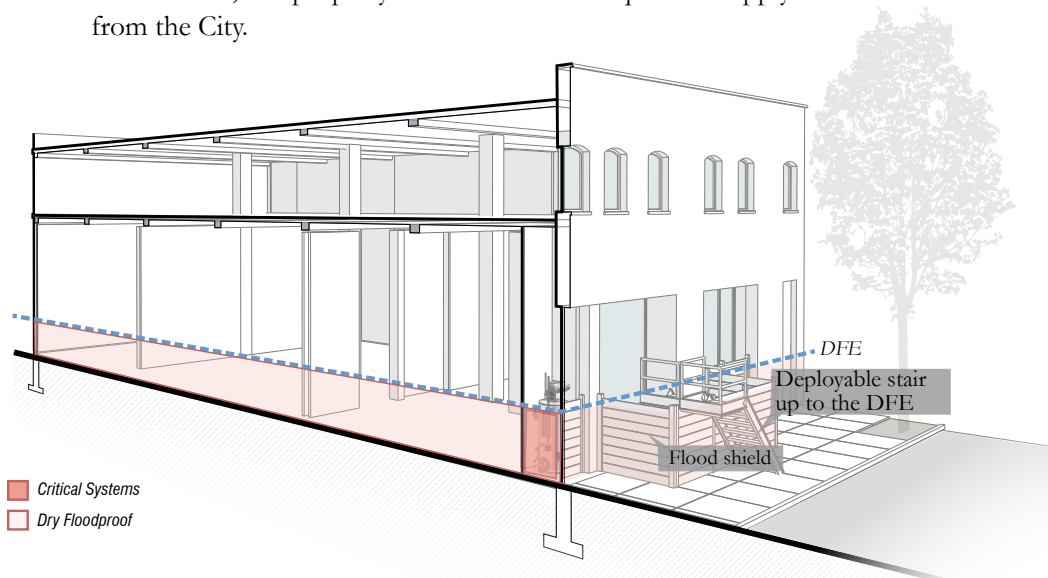
Dry floodproof critical systems. Install underdrain and sump pump system to drain water that seeps from under the slab, through walls, and around shield gaskets. The pump system and the backup power system is essential in effective dry floodproofing.



Structurally reinforce slabs, foundation walls and exterior walls below the DFE to withstand hydrodynamic and hydrostatic forces. If adjacent properties are not infilling their sub-grade spaces, reinforce foundation walls to account for new load. Add reinforcement at foundation wall below the sidewalk and at the building facade for flood shields.



Temporary flood shields and egress stairs deployed in front of a building are subject to building code requirements as well as the Department of Transportation (DOT) requirements. Given that a portion of the flood shield assembly and stairs falls onto the sidewalk, the property owner would be required to apply for revocable consents from the City.



Elevating + Wet Floodproofing

Elevating uses to at or above the Design Flood Elevation and wet floodproofing below the DFE is another option that results in a lower NFIP rate and is potentially an option for spaces with low DFEs and/or high floor-to-ceiling heights. However, in New York City, elevation may not be feasible because of the pre-existing adjacencies and structural challenges related to building typologies with attached or abutting walls. Additionally, wet floodproofed space can only be used for parking, access and storage. Elevating the lowest floor several feet above sidewalk level also challenges the relationship between buildings and the street, resulting in access and urban design issues. These particular urban challenges are discussed in more detail in DCP's *Designing for Flood Risk and Retrofitting Buildings for Flood Risk* reports. For more information, visit nyc.gov/planning.

Alternative options...



Non-substantially improved buildings within the floodplain have greater flexibility in complying with Appendix G of the New York City Building Code. The alternative adaptation strategies illustrated below are not recognized by FEMA for Substantially Improved or Substantially Damaged. Under current NFIP regulations, these measures may not lower insurance premiums. However, they minimize flood-damage and reduce recovery times.

Dry Floodproofing + Wet Floodproofing



Wet floodproof below the DFE. Install flood vents and replace all windows, doors and finishes with flood damage-resistant materials.



Install deployable flood shield and create a dry floodproofed vault at the rear. Provide alternate means of egress over flood shield and relocate any high-priority items to dry floodproofed enclosure.



Add reinforcement to party walls, exterior walls and foundation slab at dry floodproofed enclosure and ensure changes do not impact neighboring property's structural integrity.



Critical systems remain in place within a dry floodproofed enclosure. Provide emergency shut off above the DFE. Install pump systems and back up generators. (This strategy requires smaller pumps to address the smaller space, reducing power consumption.)

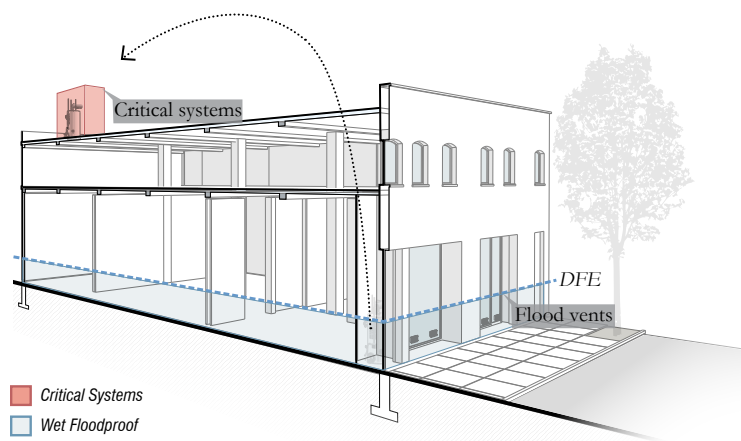
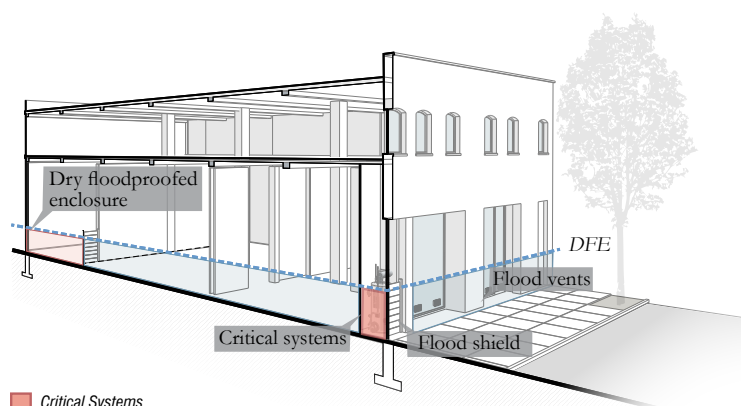
Wet Floodproofing



Wet floodproof below the DFE. Install flood vents and replace all windows, doors and finishes with flood damage-resistant materials.



Relocate critical systems to the roof. Anchor systems securely and protect from windborne debris. Raise electrical utilities above DFE within electrical closet.



Note:

Some critical systems may need to be enclosed in fire-rated enclosures to meet FDNY Fire Code requirements.

If retrofitting existing party walls is problematic, building an interior structural wall inside the building, next to the party wall, is a practical option. This approach results in minimal floor area loss and facilitates effective waterproofing of the structure.

Resources

FEMA - [fema.gov/plan-prepare-mitigate](https://www.fema.gov/plan-prepare-mitigate)
 NYC Department of City Planning - [nyc.gov/plan](https://www.nyc.gov/plan)
 NYC Department of Buildings - [nyc.gov/buildings](https://www.nyc.gov/buildings)
 NYC Department of Transportation - [nyc.gov/dot](https://www.nyc.gov/dot)
 NYC Emergency Management - [nyc.gov/emergency-management](https://www.nyc.gov/emergency-management)

Working collaboratively

Many arts districts have the inherent benefit of including businesses and organizations with common interests and needs, which offers an opportunity to consolidate resources in planning for resiliency. Whether formulating a preparedness plan with neighbors, sharing ideas for floodproofing spaces or identifying specialists to assist in the aftermath of a flood event, working together adds value to any resiliency strategy.





Collocation and clustering of related businesses presents an opportunity to not only support a successful arts district, but also to better prepare for emergencies. Coordination is key at the building and district scales, especially between the gallery renters and the landlord or building management. In mixed-use buildings, coordination with residents is also necessary.

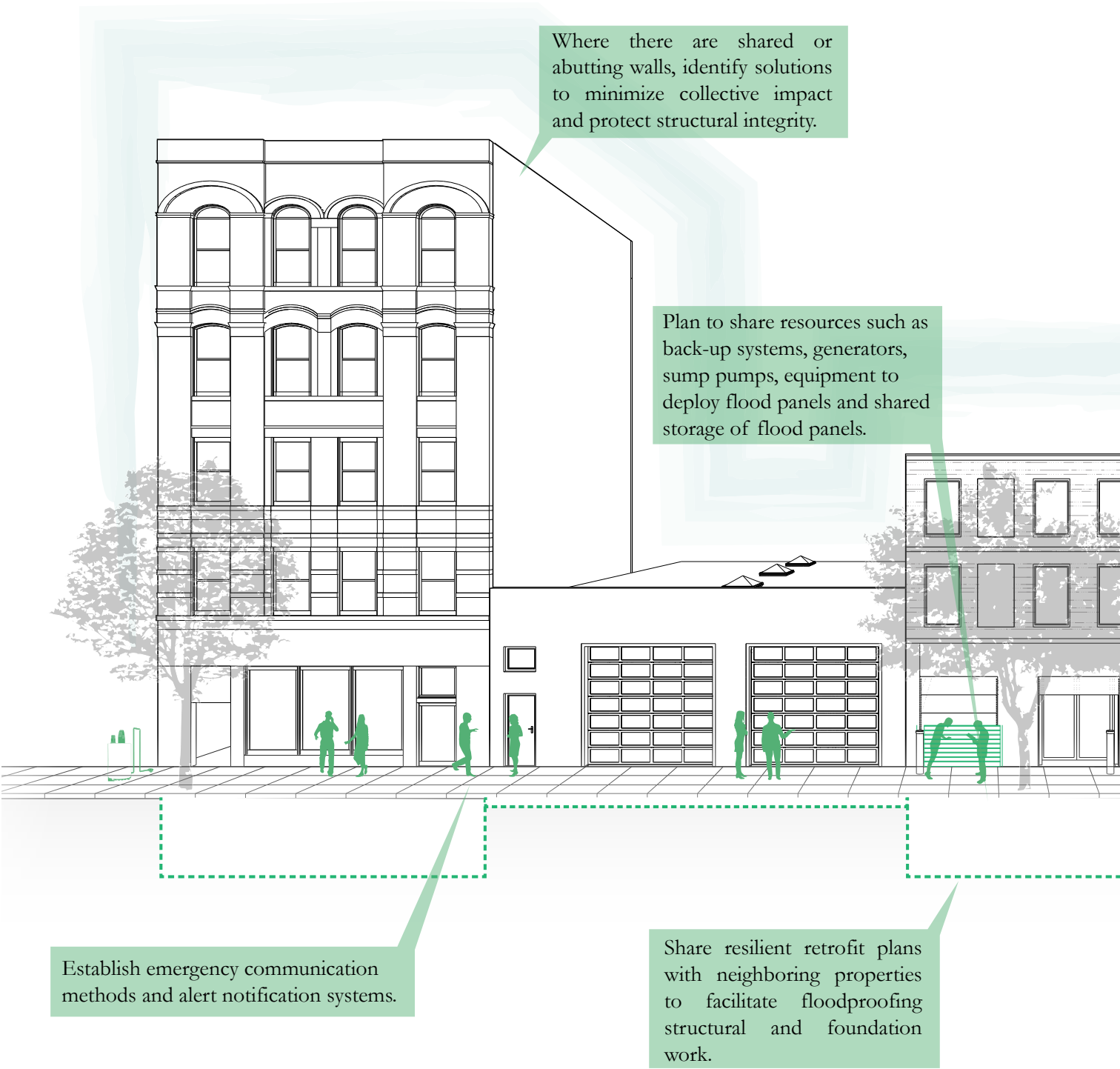
Preparedness planning is especially critical for street-level businesses because they are especially vulnerable to the effects of flooding. Upper-floor businesses, although not directly exposed to flood waters, also experience business interruption when buildings' mechanical systems are damaged, local infrastructure (streets, access and transit) is affected and the regular volume of visitors is diminished.

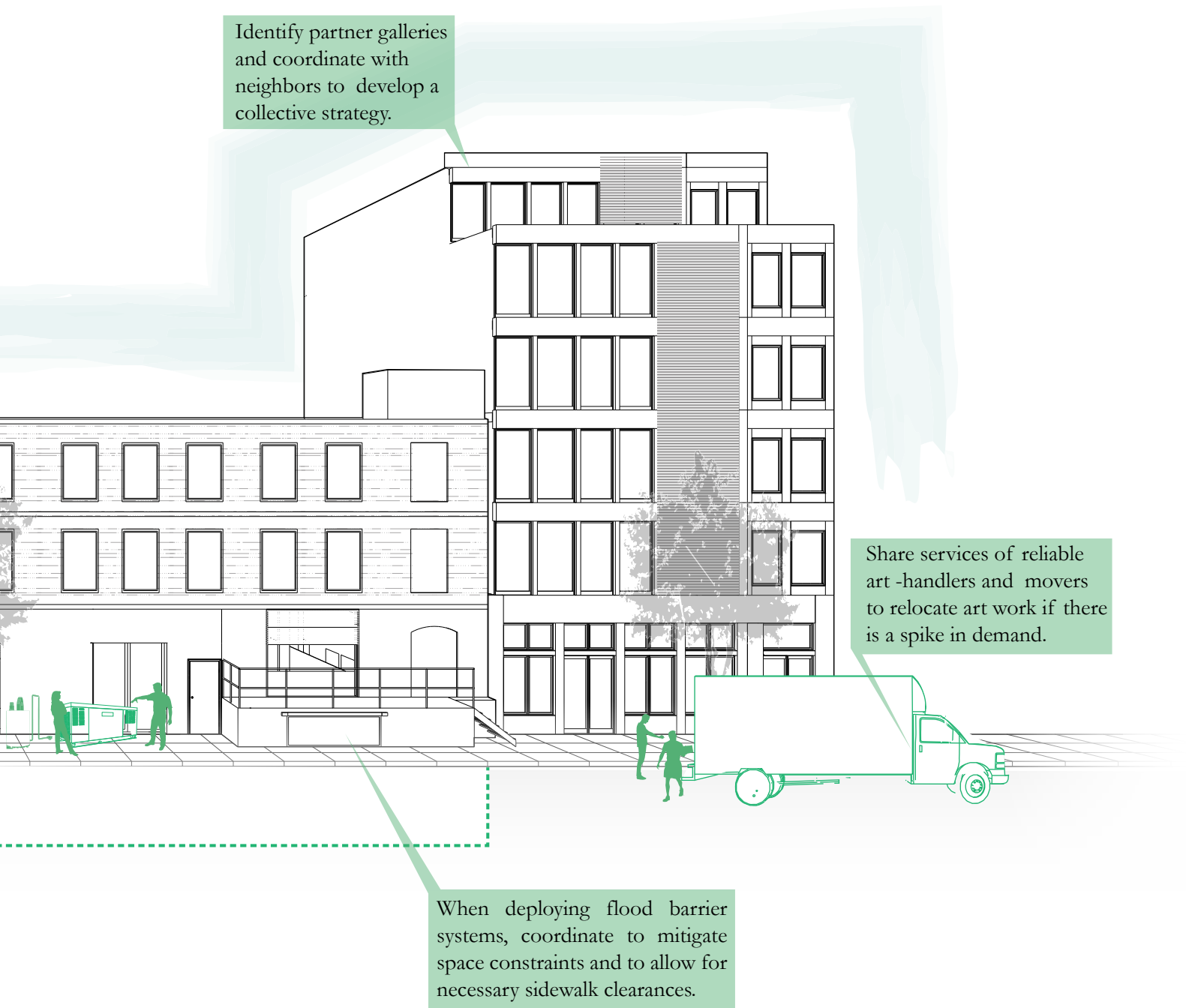
Resiliency strategies must be incorporated into day-to-day operations, and many of

these changes can be made less onerous by working collaboratively. Access to resources can be difficult in the aftermath of a flood event, as experienced by many galleries during Hurricane Sandy. Establishing readiness plans with neighboring businesses to share resources, including sump pumps, generators, equipment and man power to deploy flood shields, and information on responsible vendors and contractors, could better prepare the community for recovery.

Adapting spaces and buildings for resiliency also requires coordination with adjacent properties. This is especially important in New York's dense and close-knit urban landscape, where buildings are attached or have abutting walls. Retrofitting strategies and costs are often contingent on neighboring properties' ability to adapt. Working collaboratively will help to plan and implement strategies that not only save time, but also potentially reduce costs.

Collaborative Strategies





Resources

FEMA - [fema.gov/plan-prepare-mitigate](https://www.fema.gov/plan-prepare-mitigate)
 NYC Department of Cultural Affairs - [nyc.gov/dcla](https://www.nyc.gov/dcla)
 NYC Department of Buildings - [nyc.gov/buildings](https://www.nyc.gov/buildings)
 NYC Emergency Management- [nyc.gov/emergency-management](https://www.nyc.gov/emergency-management)

Resources



INFORMATIONAL RESOURCES

New York City Emergency Management

Ready New York is New York City Emergency Management's education campaign to prepare residents and businesses for emergencies.

nyc.gov/readynyc

New York City Department of Cultural Affairs

The Department of Cultural Affairs maintains a list of organizations that provide services and information useful to artists and cultural organizations:

nyc.gov/html/dcla/html/resources/resources.shtml

TECHNICAL GUIDANCE

Federal Emergency Management Agency

Floodproofing for Non-Residential Buildings / July 2013

fema.gov/media-library/assets/documents/34270

Technical Bulletin 3, Non-Residential Floodproofing - Requirements and Certification (1993)

fema.gov/media-library/assets/documents/3473

Technical Bulletin 2, Flood Damage-Resistant Materials Requirements (2008)

fema.gov/z/h-hans/media-library/assets/documents/2655

Flood Insurance Manual, Effective November 1, 2015

fema.gov/media-library/assets/documents/110085

New York City Department of Buildings

Building Code Appendix G Flood-Resistant Construction

nyc.gov/html/dob/html/codes_and_reference_materials/reference.shtml

New York City Department of City Planning

Retrofitting Buildings for Flood Risk

nyc.gov/retrofittingforfloordrisk

Designing for Flood Risk

nyc.gov/designingforfloordrisk

Additionally...

CultureAID

cultureaidnyc.com

Alliance for Response

afrnyc.org

New York Foundation for the Arts - NYFA Source

source.nyfa.org

Craft Emergency Relief Fund

craftemergency.org

studioprotector.org

American Institute for Conservation of Historic and Artistic Works

conservation-us.org

Council of State Archivists

statearchivists.org

Heritage Preservation and the Heritage Emergency National Task Force

heritagepreservation.org

Fractured Atlas

fracturedatlas.org

arts-insurance.info

Library of Congress

loc.gov/preservation/emergprep

U.S. Small Business Administration

sba.gov

Glossary

Base Flood Elevation (BFE)

The computed elevation in feet to which floodwater is anticipated to rise during the 1% annual chance storm shown on the Flood Insurance Rate Maps (FIRMs) issued by the Federal Emergency Management Agency (FEMA). A building's flood insurance premium is determined by the relationship between the BFE and the level of the lowest floor of a structure.

1% Annual Chance Floodplain (100 Year Floodplain)

The area that has a 1% of flooding in any given year. It is indicated on FEMA's Flood Insurance Rate Maps (FIRMs). See "Special Flood Hazard Areas," below.

Design Flood Elevation (DFE)

As defined by the New York City Building Code, the design flood elevation (DFE) is the minimum elevation to which a structure must be elevated or floodproofed. It is the sum of the BFE and a specified amount of freeboard (see definition below) based on the building's structural category.

Flood Insurance Rate Maps (FIRMs)

The official flood map, on which FEMA has delineated the Special Flood Hazard Area (SFHA), 0.2% annual floodplain (Shaded X zone), Base Flood Elevations (BFEs) and floodways.

Floodproofing, Dry

For non-residential buildings, a flood retrofitting technique that results in the building resisting penetration of floodwater up to the DFE, with walls substantially impermeable to the passage of water and structural components having the capacity to resist specified loads.

Floodproofing, Wet

A flood retrofitting technique designed to permit parts of the structure below the DFE to intentionally flood, by equalizing hydrostatic pressures and by relying on the use of flood damage-resistant materials. With this technique, parts of the building below the DFE are only to be used for parking, storage, building access or crawl space.

Freeboard

An additional amount of height above the BFE to provide a factor of safety to address the modeling and mapping uncertainties associated with FIRMs, as well as a degree of anticipated future sea level rise. It is a risk reduction requirement found in the Building Code Appendix G and recognized by NFIP as an insurance premium reduction factor. In New York City, one foot of freeboard is required for commercial and multi-family buildings, and two feet for single- and two-family buildings.

National Flood Insurance Program (NFIP)

Federal program that makes flood insurance available to municipalities that enact and enforce floodplain management regulations that meet or exceed the criteria established by FEMA. Under this program, properties within the SFHA with a federally backed or regulated mortgage are required to buy flood insurance. Communities participating in the NFIP must incorporate flood-resistant construction standards into building codes.

Special Flood Hazard Areas (SFHA)

Area of the floodplain that has a 1% chance, or greater, of flooding in any given year. Also referred to as the 100-year floodplain or the 1% annual chance floodplain. The SFHA is separated into zones depending on the level of hazard:

V Zone

The area of the SFHA subject to high-velocity wave action that can exceed 3 feet in height. More restrictive New York City Building Code standards apply.

Coastal A Zone

A sub-area of the A Zone that is subject to moderate wave action between 1.5 and 3 feet in height. Building regulations are more restrictive than in A Zones and can be similar to those standards that apply for V Zones.

A Zone

The area of the SFHA that is subject to still-water inundation by the base flood with specific New York City Building Code standards.

Substantial Damage

Damage sustained by a building whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed fifty percent of the market value before the damage occurred. When a building is substantially damaged or substantially improved (see below), it is required to comply with Appendix G of the Building Code as if it was a post-FIRM structure.

Substantial Improvement

Any repair, reconstruction, rehabilitation, addition or improvement of a building with cost equaling or exceeding fifty percent of the current market value of the building. When a building is substantially improved, it is required to comply with the flood-resistant construction requirements of Appendix G of the Building Code.

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