QUICK REFERENCE GUIDE | RESILIENCY





Left: Flooding in Montpelier, VT caused by a severe storm on July 10, 2023 following weeks of rain which submerged the basement of Unitarian Church of Montpelier. Photo by Jeb Wallace-Brodeur.
Center: Ice caused by a pipe breaking at Koinonia Baptist Church, Baltimore, MD as a result of a snowstorm and freezing temperatures. Photo by Koinonia Baptist Church.
Right: The sanctuary of the Cathedral of All Souls, Asheville, NC following the flooding caused by Hurricane Helene on September 27, 2024. Photo by Michael McLaughlin.

RESILIENCY

Resiliency – the capacity to withstand and recover from a natural hazard.

Natural disasters can strike anytime and anywhere, often without notice, and can damage or destroy historic buildings. As natural hazards become more frequent and severe, it is important to understand how disasters could affect historic properties; develop resilience plans; and take steps to minimize the loss, damage, or destruction that could be caused by natural hazards to historic buildings, their features, or their site. The goal is to make historic properties more resilient while preserving their character-defining features.

GENERAL RECOMMENDATIONS

All projects funded by the National Fund for Sacred Places must respect the property's historic character and materials, and must adhere to the Secretary of the Interior's Standards for Rehabilitation. Below are general recommendations for adapting historic buildings to be more resilient, but they do not cover all potential specific recommendations. Reference the resources in the section below for more detailed recommendations.

RESILIENCE PLANNING

- **CONSULT:** Consult with qualified historic preservation professionals (such as architects, engineers, and other professionals) early in the resilience planning process to ensure the correct steps and best adaptive treatment measures are taken.

- **IDENTIFY:** Identify potential natural hazards (such as flooding, hurricanes, tornadoes, earthquakes, wildfires, etc.) that could impact the historic property using current climate information and data available. Reassess these hazards periodically as more information becomes available.
- **ASSESS:** Assess the possible impacts that potential natural hazards could have on the historic building, character-defining features, and site. Reassess these impacts regularly as more information becomes available or there are changes to the historic property.
- **REVIEW COMPLIANCE REQUIREMENTS:** Review and understand federal, state, and local compliance requirements. For example, determine whether the local community has adopted requirements to improve community-wide resilience and whether there are special exemptions or variances for historic properties.
- **DOCUMENT:** Document the historic property to create a record in case it is damaged during a natural hazard and to guide future repairs, if needed.
- **EXISTING CAPACITY:** Evaluate the property's existing capacity to sustain and recover from a natural hazard.
- **MONITOR AND MAINTAIN:** Regularly monitor the historic property and maintain it in good condition to minimize the potential impact of a natural hazard on the building.
- **INSURANCE:** Contact your insurance provider to verify terms of your coverage.

ADAPTIVE TREATMENTS

- **TEMPORARY PROTECTIVE MEASURES:** If temporary protective measures can be deployed to protect a historic property during a natural hazard, select one that will protect and preserve the historic property and building's character-defining features from the natural hazard and can be deployed using the available labor, equipment, and warning time. Establish procedures, assign responsibilities, and conduct regular training for deploying temporary protective measures. If devices or stanchions are needed to attach the temporary protective measure, install them in a concealed or secondary location on the building, and in a manner that does not damage, alter, or otherwise affect the property's historic character.

  Examples of Temporary Protective Measures:
  - Installing sandbags, temporary dams, or free-standing flood barriers to redirect floodwater and debris away from historic properties.
  - Installing a flood wrapping system (such as waterproofing plastic or synthetic sheeting) around the perimeter of the historic building to protect doors, vents, and lower walls and prevent water from seeping into the structure.
  - Installing floodgates or removable flood barriers at doors and windows to prevent floodwater from entering the building.
  - Installing plywood, acrylic, or high-tensile strength hurricane fabric panels over windows and doors to protect them from high-velocity winds and airborne debris.
  - Installing temporary protective covers, wraps, or fire shutters over building opening (such as windows, doors, and vents), individual architectural features, or the entire building to protect the historic building from embers and radiant heat during a wildfire.

- **BUILDING ADAPTIVE MEASURES:** Undertake adaptive measures on a historic building that prevent or minimize the potential loss, damage, or destruction caused by a natural hazard while retaining and preserving significant features and the overall historic character of the building. When planning for potential adaptive measures, consider all feasible alternatives, including local and regional traditions. The selected adaptive measure should be appropriate for the historic building and the potential natural hazard, because not every adaptive measure is appropriate for every historic building.

  Examples of Adaptive Measures for Historic Buildings:
  - Extending downspouts away from the historic building to minimize water infiltration during heavy rains.
  - Installing sump pumps at the lowest level of the historic building to move water away from the foundation. If possible, the sump pump should be installed with a backup power source.
  - Dry-floodproofing the historic building to keep water out.
  - Wet-floodproofing the historic building to allow floodwater to move through openings in the crawl space, basement, or lower interior spaces, and then drain out as floodwater recedes.
  - Elevating the historic building above the floodplain.
  - Cleaning roofs, gutters, and downspouts to remove leaves, pine needles, and other debris that can clog gutters and downspouts, ensuring they can drain water away from the building. It will also reduce fuel that could catch fire from flying embers during a wildfire.
  - Installing fine mesh on all vents to prevent embers from entering the interior of the historic building.
  - Applying fire-retardant coatings or intumescent paints to exterior wood features to help resist ignition and slow flame spread.
  - Replacing combustible materials on the exterior building envelope with fire resistant substitute materials that match the historic as closely as possible in scale, texture, and color.

- **SITE ADAPTIVE MEASURES:** Undertake adaptive measures on a historic site that prevent or minimize the potential loss, damage, or destruction caused by a natural hazard while retaining and preserving the historic site, landscape features, topography, setting, relationship of the historic building to its site, archeological resources, and other cultural or religious features. When planning for potential adaptive measures, consider all feasible alternatives, including local and regional traditions. The selected adaptive measure should be appropriate for the historic site and the potential natural hazard, because not every adaptive measure is appropriate for every historic site.

  Examples of Adaptive Measures for Historic Sites:
  - Regrading the site to divert water away from a building.
  - Reducing or removing hardscape (non-permeable) surfaces on the site to reduce runoff.

- Installing an underground drainage system (such as cisterns and dry wells) to move water away from the building and contain the stormwater on site.
- Constructing swales, berms, or retaining walls to direct water away from the building and contain the stormwater on site.
- Pruning mature trees or removing diseased trees to reduce potential damage from a severe wind event.
- Reducing the number of plants and vegetation immediately adjacent to the historic building to reduce fuel for wildfires.

RESPONSE AFTER THE NATURAL HAZARD

- **DOCUMENT:** Document the damage caused by the natural hazard through photographs, videos, and written notes before cleaning up the damage.
- **CLEAN:** Clean the historic property using the least invasive method possible after a natural hazard. If possible, preserve historic materials in place. For example, when drying a historic building following a flood, use the least invasive method to release trapped water and increase ventilation to help facilitate drying, such as drilling small vent/drain holes in the wall or temporarily removing baseboards on plaster walls.
- **REPLACE IN-KIND:** Replace damaged or deteriorated historic materials in-kind where the traditional material can resist natural hazards. If the historic materials are not resilient, replace damaged or deteriorated materials with new resilient substitute materials that match the appearance and design of the historic materials, and do not harm the surrounding historic materials.

RESOURCES

The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings | Resilience to Natural Hazards is found on Pages 153 - 155

The Resilience Design Standards: Model Standards for North Carolina's Historic Properties

The Secretary of the Interior's Standards for Rehabilitation & Guidelines on Flood Adaptation for Rehabilitating Historic Buildings

Treatment of Flood-Damaged Older and Historic Buildings, National Trust for Historic Preservation

Preservation Brief #52: Wildfire Adaptation and Historic Buildings

Hurricane Preparedness and Recovery for Owners of Historic Properties, National Trust for Historic Preservation

National Trust for Historic Preservation Disaster Recovery Resources

How to Protect Your Historic Property, National Trust Insurance Services, LLC

How to Prepare for the Next Natural Disaster, National Trust Insurance Services, LLC

10 Steps to Mitigate Natural Disaster Damage by Julia Rocchi, National Trust for Historic Preservation

10 Tips for Bringing Historic Properties Back from a Flood by Julia Rocchi, National Trust for Historic Preservation

Preservation Brief #16: The Use of Substitute Materials on Historic Building Exteriors