Flooding risk has long been a major challenge for many historic properties. Changing weather patterns, stronger hurricanes and other extreme weather events, sea level rise, increased nuisance flooding, king tides, and continuing development in flood plains are some of the factors increasing the risk of flooding events, both in terms of their frequency and magnitude.

In November 2019 the National Park Service published *Guidelines on Flood Adaptation for Rehabilitating Historic Buildings* (Flood Guidelines) in response to a request for technical preservation guidance specific to historic properties at risk of flooding.

The goal of the *Flood Guidelines* is to provide information about how to adapt historic buildings to be more resilient to flooding risk in a manner that will preserve their historic character and that will meet *The Secretary of the Interior's Standards for Rehabilitation* (SOI Standards) in conjunction with the *Guidelines for Rehabilitating Historic Buildings.*

The *Flood Guidelines* should only be applied to historic properties with an **established risk of flooding**. Adaptation treatments should increase the building's resilience to flooding risks as much as possible, but should do so **without destroying significant historic materials, features, or spaces**.

The treatments described may require more change than would normally be acceptable in other contexts. Consequently, such treatments would generally not be appropriate to use in the majority of rehabilitation projects when the historic building does not have a flood risk.

PROJECT PLANNING

Before undertaking any work to adapt a historic building to be more resilient to potential flooding, research about the actual flood risk as well as the historic property must be undertaken. The guidelines include sections on identification of risks, vulnerabilities and resilience, as well as determining character-defining features, documentation and alternatives analysis.

Select Considerations for Adaptation Treatments

- *Site and Landscape Adaptations* have the benefit of leaving the historic building itself unaltered, but they can affect the relationship of a building to its site and setting. Altering the existing site conditions must be done with thoughtful examination of potential impacts to neighboring properties.
- *Dry Floodproofing* is a method designed to keep water out of a building. This treatment requires establishing a watertight seal on the exterior of the foundation and sealing all interior spaces below the established flood risk level. This method requires a high frequency of maintenance when exposed to repeated flooding.
- *Wet Floodproofing* allows water to enter a building during a flood event and drain out as the flood waters recede. It is not recommended where flooding is expected to exceed 24 hours in duration and is generally not appropriate for a historic building that still retains a high level of historic materials, features, finishes, and spaces at or below the established flood risk level.
- *Elevate the Building on a New Foundation* is a method that involves raising the height of a building. The size, scale, height, and massing of a building will affect how much change in height may be acceptable without impacting the historic character of the property. This treatment is rarely acceptable as it can greatly affect the historic character and integrity of the building, and any associated historic district.
- *Elevate the Interior Structure* by removing the existing ground-floor level and replacing it with a new floor plate at a level above the established flood risk level, leaving the exterior structure virtually unchanged. This treatment is most suitable for buildings with large-volume first-floor spaces, but can have a significant impact on historic buildings with intact, character-defining ground level features.
- *Abandon the First Story* modifies a multi-story building to relocate all living spaces to upper floors above the established flood risk level. The abandoned first story must be altered and adapted into a utilitarian wet or dry floodproofed space. Several structural issues associated with this treatment must be evaluated, including assessing the walls, columns, and footings and potentially anchoring the building differently, depending on the existing connections. The building structure must be able to support a filled basement, moving water beneath it, or keeping water out of the building.
- *Move the Historic Building* involves separating the building from its foundation and relocating it to a new site and foundation. Relocating a historic building is considered only when the property is expected to flood repeatedly, succumb to river or shoreline erosion, or is subject to permanent inundation due to sea level rise or subsidence. It is considered the last resort.

See the full guidelines and additional technical resources at *https://www.nps.gov/tps/standards/rehabilitation/flood-adaptation.htm*

TOP: Cape Hatteras Lighthouse on the move in 1999. Photo National Park Service. **ABOVE:** Wai'oli Mission Church, Hanalei, Kaua'i, after the spring 2018 rainfall that inundated the North Shore of Kaua'i. The Garden Island. Photo Susan Ferrell.