

DESIGN GUIDELINES FOR ELEVATING HISTORIC BUILDINGS

Appendix A: Graphical Support to Building Elevation Design Concepts

Prepared for the Newport Restoration Foundation
and City of Newport Historic District Commission



2023



KEEPING
HISTORY
ABOVE
WATER

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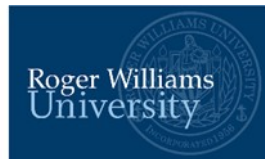
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project



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APPENDIX A—DESIGN GUIDELINES FOR ELEVATING HISTORIC BUILDINGS

Introduction

This document provides property owners with graphic designs for the preservation and protection of historic buildings and structures in Newport’s flood zones. Appendix A supplements information provided in “Design Guidelines for Elevating Historic Buildings” adopted by the Newport Historic District Commission (HDC). The Newport community has historically been affected by significant flooding in low-lying areas in part due to its proximity to Narragansett Bay and past development upon filled-in marsh lands. However, flooding, hurricanes, and high tides in these coastal neighborhoods are only intensifying because of climate change. Many of these neighborhoods are included within the Newport Historic District and represent a significant collection of 18th and 19th-century buildings, including National Historic Landmarks.

In 2016, the Newport Restoration Foundation (NRF) hosted the first Keeping History Above Water® Conference to specifically discuss climate change and building adaptation in Newport’s historic coastal neighborhoods. Case studies from the conference informed strategies for building adaptation and resiliency in historic communities threatened by sea level rise. Since then, Newport’s HDC has concluded the best policy for long-term preservation in these neighborhoods is to support voluntarily elevating structures.

The guidelines apply to all contributing and non-contributing buildings within the Newport Historic District—a collection of nearly 400 properties. The guidelines include four considerations to guide the HDC and applicants in reviewing elevation projects for historic buildings:

- Streetscapes and Context Consideration
- Site Design Consideration
- Foundation Design Consideration
- Architecture and Preservation

The objective of the guidelines was to also include a definition section and three appendices:

- Appendix A: Graphical Support to Building Elevation Design Concepts
- Appendix B: Additional Flood Mitigation Options for the Homeowner
- Appendix C: Landscape Best-Practices and Recommendations Related to Flood Mitigation and Building Elevation

Appendix A is designed to assist the HDC and applicants to visualize proposed adaptations alongside the written guidelines. The appendix is intended to be a tool for historic homeowners in Newport as well as serve as a model for other historic communities to articulate their local flood adaptation strategies.



Dwellings on most blocks in the Newport Historic District are consistent in their height, setback, street orientation, and materials.

Evaluating Your Flood Risk

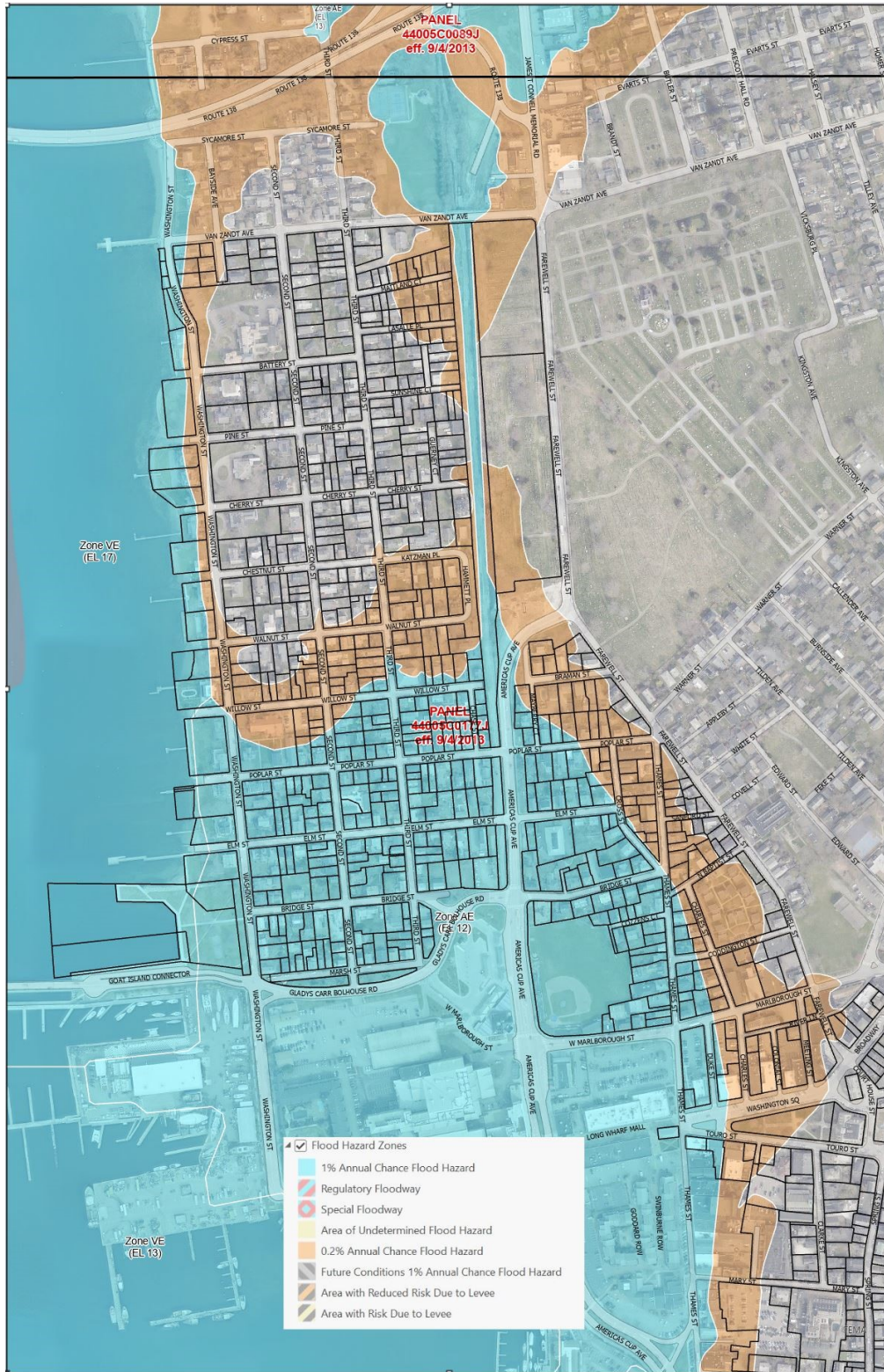
To obtain an accurate flood risk assessment for your property you will need to acquire an Elevation Certificate from a licensed surveyor, architect, or engineer. An Elevation Certificate will identify the height of the lowest floor relative to the Base Flood Elevation (BFE). The BFE is the elevation to which flood waters are anticipated to rise during the event with wave effects having a one percent chance of being equaled or exceeded in any given year (also known as “base flood” and “100-year flood”).

The BFE is the basis of insurance and floodplain management requirements and is shown on Flood Insurance Rate Maps (FIRM). FIRMs are the official maps for Newport on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs) and the risk premium zones applicable to the community. The height of the lowest occupied floor, which may be the basement, can be used to calculate flood insurance rates and determine the height to which the building must be protected to comply with Newport’s floodplain management regulations.

The **National Flood Insurance Program (NFIP)** provides insurance to help reduce the socio-economic impact of floods. The NFIP is managed by FEMA and is delivered to the public by a network of private insurance companies and by directly with the NFIP. Property owners and other stakeholders should consult Newport’s NFIP rating, and therefore, the flood insurance rates and local floodplain regulations and requirements when determining the best approach for each historic property. Amortizing future savings in flood insurance may offset the costs of elevating a building, and should be considered carefully.

Many properties in flood zones such as those in the Newport Historic District were constructed prior to the adoption of the community’s first Flood Insurance Rate Map (FIRM). Several provisions of the 2014 law apply to these “pre-FIRM” properties. In consultation with local building code officials, the HDC, and City Staff, a property owner can determine an appropriate elevation level and methods to mitigate associated impacts on historic buildings. **Additionally, if the owner of a historic property is seeking federal or state historic tax credits or grants, it is essential to engage in early discussions with the State Historic Preservation Office pertaining to those requirements.**

The FIRM identifies the geographical extent of the one-percent (1%) annual chance floodplain boundary, also known as the 100-year floodplain, or Special Flood Hazard Area (SFHA). Buildings outside of the SFHA with levels below grade, such as basements, may be equally vulnerable to flooding. Properties outside of designated floodplains may experience flooding from rising floodwaters or extreme weather events.



The blocks of the Newport Historic District next to Narragansett Bay contain some of the city's oldest and most significant buildings.



The blocks of the Newport Historic District next to Narragansett Bay are also at high risk of flooding and have Design Flood Elevations ranging up to thirteen feet.

What is Elevation?

Elevation refers to the process of raising an existing building on its foundation to a height above projected future high water caused by storms and floods. **Low Increase Building Elevation** is the elevation of a historic building due to the threat of imminent flooding without significant changes to its historic integrity. These changes are typically around four feet or less in urban environments. Increased elevation heights in urban areas are typically less because of the building's proximity to the right-of-way, its proximity to other buildings in the streetscape, and the proximity of neighboring buildings to the right-of-way.

High Increase Building Elevation is the elevation of an historic building due to the threat of imminent flooding where the historic integrity of the building may be affected due to the increased elevation and the resulting changes to the landscape, such as increased set back, relationship to adjacent buildings, alterations to the staircase, handicap accessibility etc. High increase elevations are those which are four feet or more above grade.

Both low and high elevation projects have the potential to impact a property's historic and architectural integrity. Integrity is the ability of a property to convey its significance through seven key aspects as defined by the National Park Service. These aspects are location, design, setting, materials, workmanship, feeling and association. To retain historic and architectural integrity a property must maintain several, if not all, of these key aspects.



The ca. 1725 Christopher Townsend House at 74 Bridge Street is one of the first properties in Newport to be elevated using the city's elevation guidelines.

An elevation project will require detaching a building from its original foundation and placing it on a new foundation at an increased height. The amount of height required, retention of original materials, design of new materials, and changes in the property's location and setting are among the factors that will determine if historic integrity is retained.

The potential for flooding in Newport makes elevation a significant factor for homeowners faced with repeated flooding and rising insurance rates. By applying guidelines, the HDC and City Staff encourages a consistent approach to elevation. These elevation design graphics are intended to assist property owners with appropriate designs and not as a list of steps for codes compliance.

What are the Design Guidelines Based On?

Newport's "Design Guidelines for Elevating Historic Buildings" were developed and adopted in 2020. These guidelines reflect "best practices" and are consistent with the National Park Service's (NPS) *Standards on Flood Adaptation for Rehabilitating Historic Buildings* published in 2021. Development of the NPS guidelines followed years of assessing the impact to historic properties and historic districts in recovery efforts from disasters such as Hurricane Katrina in 2005 and Hurricane Sandy in 2012. Hundreds of historic properties were destroyed from these and other flooding events. For historic properties which survived, resilient approaches such as dry flood proofing, wet flood proofing and elevation were undertaken—often with mixed results. Some approaches were consistent with retaining the property's essential architectural and historical character while others resulted in a loss of integrity and altered the streetscape. High elevation projects where a property is raised four feet or more above its original foundation have been particularly challenging.

The NPS standards are followed and referenced throughout this document and provide the basis for resiliency recommendations and outline flood mitigation strategies for historic buildings. Like the *Secretary of the Interior's Standards for Rehabilitation*, it is up to the Newport Historic District Commission to interpret the standards.

The NPS standards are organized by various treatments and approaches to resiliency. The most common adaptation measures are described using definitions established by the Federal Emergency Management Agency (FEMA). These adaptation treatments are:

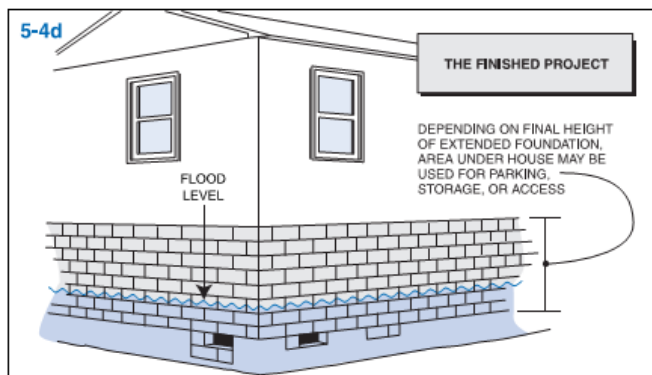
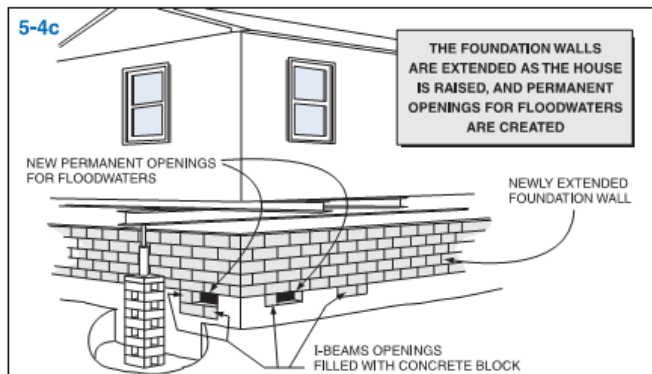
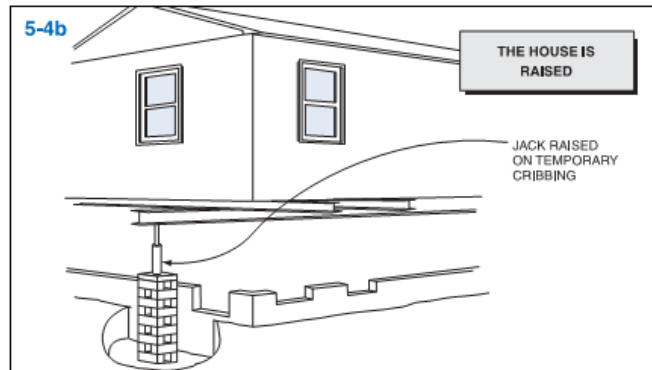
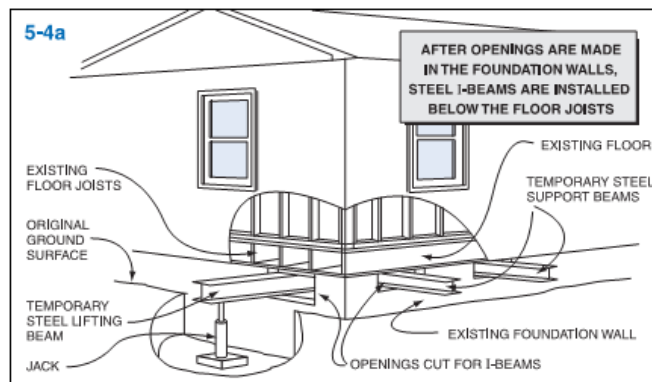
- Planning and Assessment for Flood Risk Reduction
- Temporary Protective Measures
- Site and Landscape Adaptations
- Protection of Utilities
- Dry Flood proofing
- Wet Flood proofing
- Elevating the Building on a New Foundation
- Elevating the Interior Structure

All these approaches and treatments are reviewed and assessed for their applicability to Newport's historic resources which are at risk in the city's flood zones. Planning and assessment for reducing flood risk is the first step that property owners should take prior to selecting an adaptation treatment. Temporary protective measures are treatments that usually do not have a major effect on a property's appearance. The impacts of the other adaptation treatments to the historic property will vary greatly depending on factors such as location and site conditions, historic significance, flood risk, materials, site and setting and architectural style.



Many dwellings in the Newport Historic District are on foundations that are less than two-feet above grade as at 2 Marlborough Street (above) and 31 Elm Street (below).





This illustration shows the various steps that a typical elevation project follows (Courtesy of FEMA).



Properties along some sections of Washington Street are at particular risk for flooding due to their location next to Narragansett Bay such as 62 Washington Street (above) and the dwellings between Marsh and Bridge Streets (below).



STREETSCAPE AND CONTEXT CONSIDERATIONS

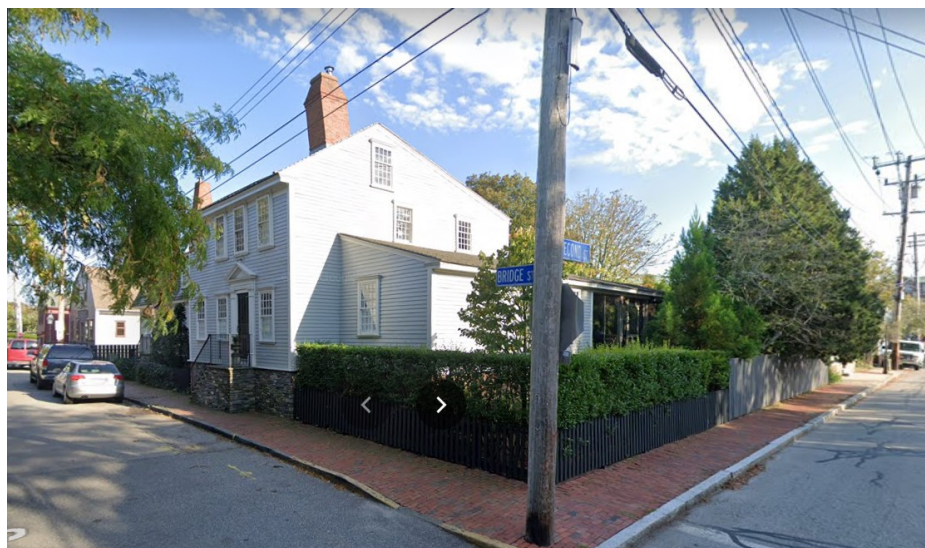
- Broadly, submittals must include careful consideration of the following:
 - Impact on important streetscape features (fences, walls, etc.)
 - Impact on relationship to immediate context and neighboring buildings
 - Impact on streetscape scale and building patterns
 - Impact on property and neighboring greenspace, trees and landscape features



Bridge Street in Newport offers examples of buildings elevated and set back beside neighbors on grade.

- More specifically, submittals for elevations must include careful consideration of contextual examples, including but not limited to elevated buildings, typical materials, and the following specific architectural details:

- Relationship of entrance to the street
- Staircases and stair configuration
- Railings and ironwork
- Foundation Treatment
- Walls (garden and site)
- Fenestration patterns
- Eave Heights
- Landscaping



70 Bridge Street in July of 2012 (top) and after elevation in September of 2019 (bottom). Landscaping, staircase configuration, fences, and foundation treatment all contribute to the elevation design.

- Building “Set-Backs” or minor relocation of buildings on the same lot may be more sympathetic to the context of historic streetscape. For example, moving a house back to allow for the construction of steps typical.



32 Walnut (above) and 38 Walnut (below) are set back enough from the sidewalk to accommodate linear stairs.



- Elevation of sister houses should be architecturally coherent within the grouping. The first sister house to be elevated shall provide a reference point for the future elevation of structures within the grouping. The HDC requires the highest quality of design of the first building in a sister house grouping to be elevated, along with others that follow.



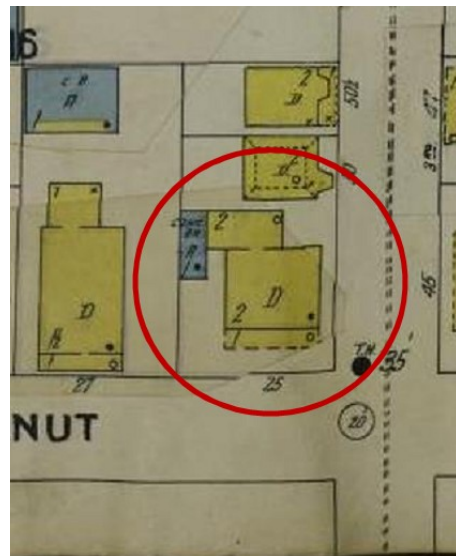
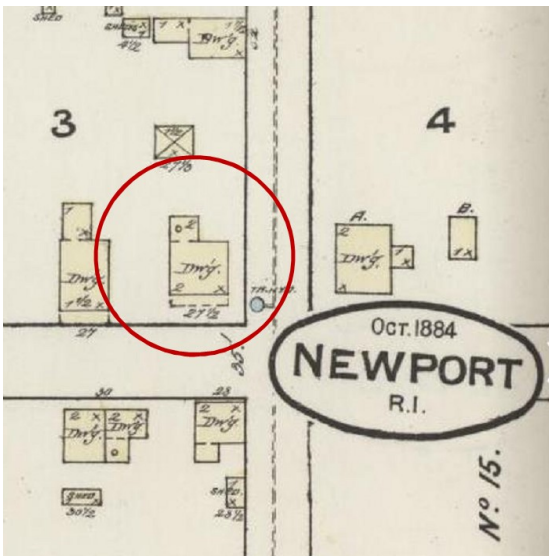
The dwellings along Maitland Court follow a similar consistency in height, grouping, and eaves.

SITE DESIGN CONSIDERATIONS

- Buildings should not be moved to accommodate additions, parking, etc. Buildings should remain in their original location on the lot, unless doing so prevents the reasonable introduction of stairs, as required by elevation to allow access to the building.



Moving and elevating dwellings was not uncommon in Newport in the 19th and 20th centuries. The house at 23 Bridge Street was originally built closer to the street as illustrated in the Sanborn Fire Insurance Map of 1950. It was later moved back on the lot and a stone retaining wall was added along the sidewalk.



Another example of a moved and elevated dwelling is at 25 Walnut Street. This two-story house was originally built closer to the street as illustrated in the Sanborn Fire Insurance Maps of 1884 (left) and 1950 (right).



At some time after 1950, this dwelling was elevated and moved back on its lot. The property was then placed on a higher grade and landscaped with a stone retaining wall. This approach is recommended where the lot size allows the house to be moved back from the street.

- If necessary to move the building on the property, the impact should be minimized with existing porches, low walls, fencing, planting beds and terraced landscaping in a manner that is in keeping with the building's architectural style. The addition of a porch, if not existing, is not appropriate.



This elevated and moved dwelling displays an appropriately sized retaining wall and period fence to screen the low elevation project (New Bern, North Carolina, photos courtesy North Carolina State Historic Preservation Office).



- Buildings that have a direct architectural relationship with their neighbors (such as sister houses or adjoined houses) will be considered within their context and the effect on one another and future elevations.



Sister houses are those which are adjacent to each other and have similar heights and form such as at 15-19 Cross Street (above) and 57 and 67 Thames Street (below). Elevating these properties to similar heights and setbacks is recommended.



- **Maintain existing hardscape features, such as planter walls, fences, gates. See Newport Ordinance Section 17.74 – “Historic Stone Walls.” Note: The HDC does not have design review over plantings such as trees, shrubs, etc. See Newport Ordinance Section 17.080.100 “Exceptions.”**



Hardscape features may include elements such as the planter box at 11 Third Street (left) or the stone retaining wall at 77 Bridge Street (right).



The dwelling at 431/2 Elm Street displays a planter wall and landscaping which provide some resistance to flooding.

- Introducing planter walls (30" or below) will help mitigate transition height.



The dwelling at 43 Elm Street illustrates how low planter walls and landscaping can reduce the visual effects of foundation height.



A similar appropriate design is the stone planter wall and landscaping at 67 Bridge Street.

- Retain to the greatest extent possible, existing pathways from the street/sidewalk to the building.



Original pathways or sidewalks leading to a dwelling should be preserved for both primary and secondary entrances. A number of dwellings have entrances in side wings as at 6 Bridge Street (above) and 15 Bridge Street (below). In any elevation project these pathways should be incorporated into the design.



- Front fencing when introduced as part of an elevation should be historically appropriate materials, such as iron or wood.



The installation of traditional Newport fence designs and materials is encouraged to assist in the screening of elevation projects. These appropriate wood picket fences are located at 7 Maintland Court (left) and 16 Thames Street (right).



Example of an appropriate traditional fence design at 94 Washington Street.

- Encourage the use of plantings or other pervious materials to help absorb water.



The front lawn of this dwelling incorporated native grasses on either side of the walkway to absorb water (Nantucket, Massachusetts).



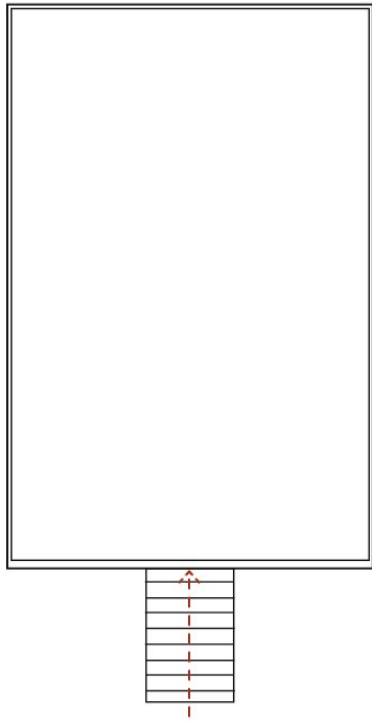
The dwelling at 5 Marsh Street uses appropriate native grasses in its planter bed.

SITE DESIGN CONSIDERATIONS GUIDELINES FOR ENTRANCE STAIRS

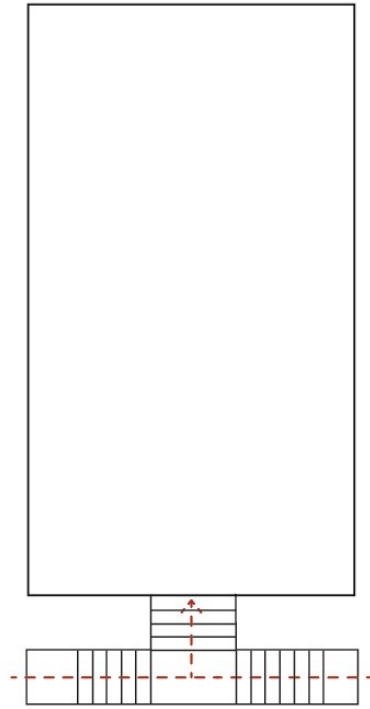
- Entry stairs should be consistent in design and material with the architectural style of the building. (Note: Building Codes and the Americans With Disabilities Act (ADA) typically require stair handrails to be between 34" and 38" in height).
- Applicants should make every effort to maintain a distinct stair connection to the sidewalk.



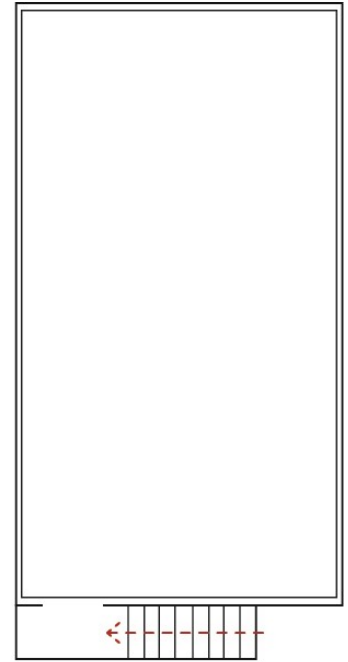
Yes: This center/linear split staircase is a traditional design in Newport and has appropriate lattice panels and the piers and posts are in alignment. The stair treads are designed with slots to allow water to flow through (26 Third Street).



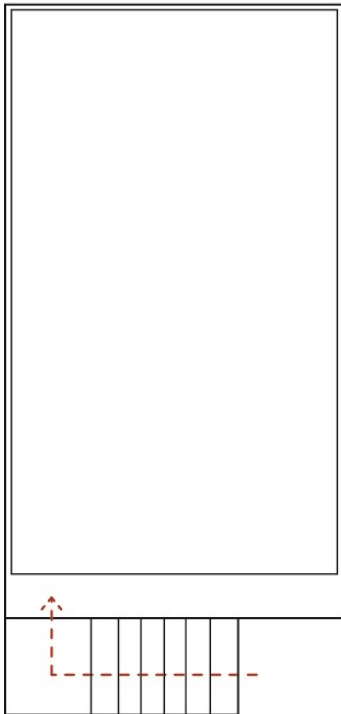
Straight Run Stair



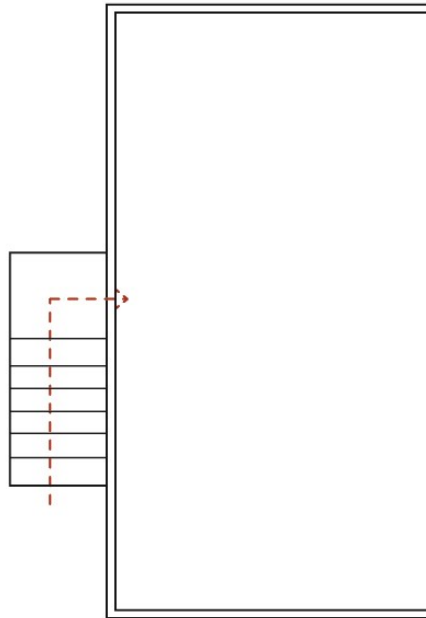
Center/Linear Split Stair



Interior Porch Stair



Side Linear Stair



Side Oriented Stair



Past elevation projects in the Newport Historic District include those at 74 Bridge Street (above) and 62 Bridge Street (below). In both cases, new center/linear split stairs were added with materials to match the foundation and appropriate iron railings.





Appropriate stair designs for elevated buildings include the side/linear stair of brick construction at 11 Third Street (left) and the center/linear split wood stair of stone at 6 Bridge Street (right). Both have iron posts and railings in traditional Newport designs.



Wood stairs are also common such as the side/linear stair at 27 Walnut Street (left) and straight run stair at 7 Elm Street (right).



Some properties in the historic district have side, rather than front, orientation to the street. The original stair configuration should be preserved in any elevation project such as 52 Second Street (above) or when a new stair is required as at 6 Cross Street (below).



FOUNDATION DESIGN CONSIDERATIONS

- Exterior foundation designs and materials should be based on historic evidence of original foundation of the building and on neighborhood/context specific examples.



Many Newport houses were built with solid stone foundations. The elevation projects at 74 Bridge Street (above) and 78 Bridge Street (below) added additional stone courses in keeping with the original designs.



- **Foundation components should complement existing façade features:**
 - **Visual support of columns**
 - **Pilaster expression**
 - **Solid foundation wall under main body of house, especially at the street front, and piers at porch with infill screening**
 - **Use traditional masonry materials**
 - **Use existing elements as visual references to be repeated and extended throughout the foundation design**



The dwelling at 29 Willow Street displays common porch elements to be retained in an elevation project such as porch column and foundation pier alignment, appropriate lattice panels and a wide skirt wall between the porch and foundation.

- Pier infill (if used) where piers are introduced or required, techniques could be:
 - Recessed or proud
 - Use louvers or custom lattice



Many Newport porches display square or diamond design lattice panels as at 45 Elm Street (left) and 46 Elm Street (right).



The dwelling at 27 Walnut Street displays recessed lattice panels in traditional square designs and these types of panels are appropriate for porches in elevation projects.

- New foundation material should match the historic foundation material as well as mortar style, and when possible, use salvaged material from the historic foundation. When building onto existing foundation, delineation between new and original is desired.



The rebuilt foundations at 62 Bridge Street (left) and 31 Walnut Street (right) reused existing stone and were designed to complement the original designs.



The porch piers on this elevated dwelling were increased in height using stone salvaged when the foundation was rebuilt (Cedar Rapids, Iowa, photo courtesy Chris Wand).

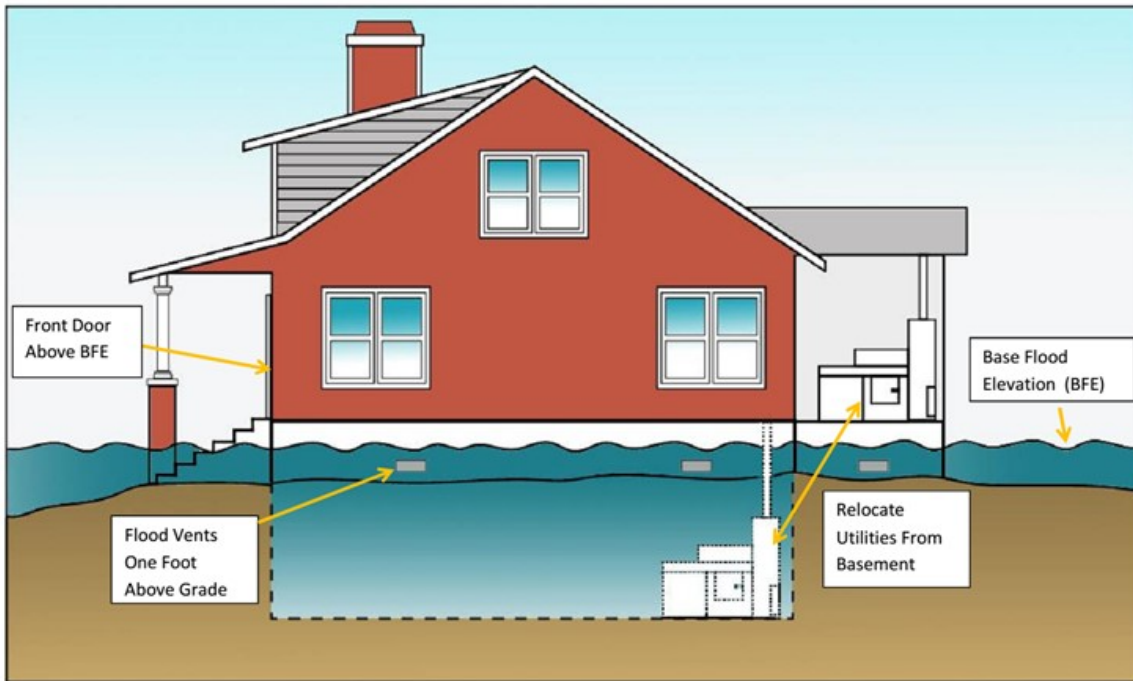
- Required flood venting should be limited to the sides and rear of the house. On occasion, if required by engineering, venting may be acceptable at the front of the house not to detract from the historic elements of the building.
- Flood vents added to a dwelling should be designed to be compatible in location, color, design and placement.



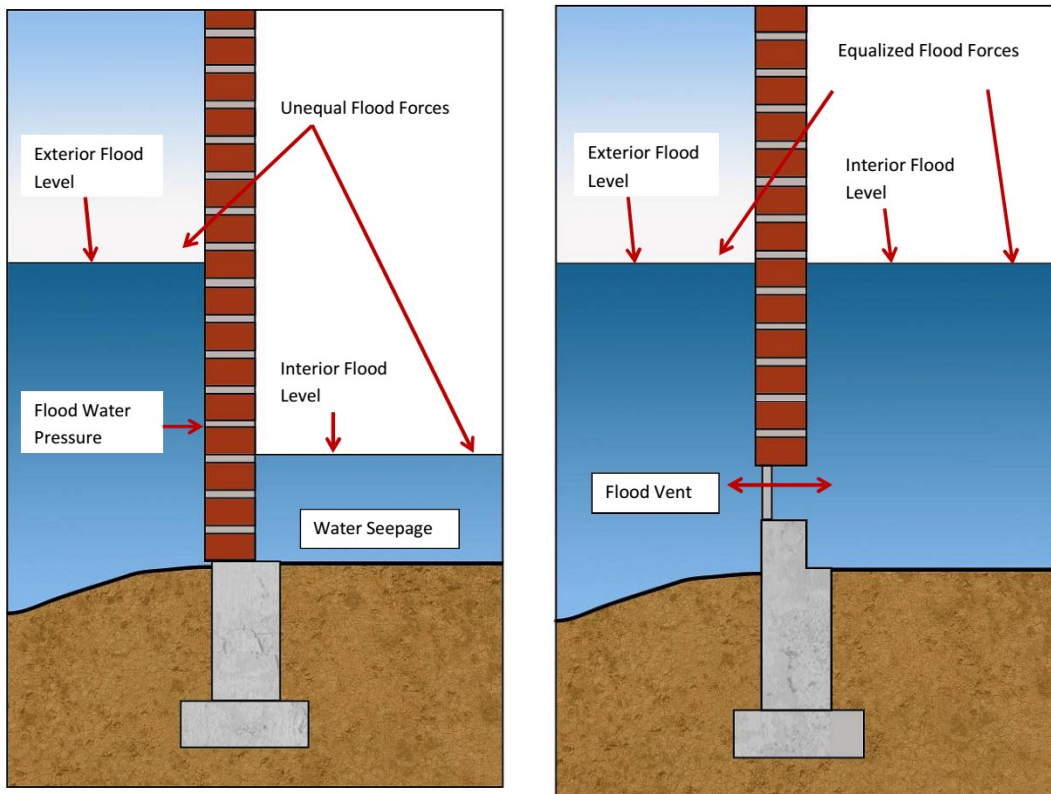
Example of a standard size flood vent and appropriate location one-foot above grade at 74 Bridge Street.



These flood vents are appropriately sited on the side elevation of the dwelling at 78 Bridge Street.



Wet flood proofing allows for water to flow through the foundation or basement area. In this type of project any utilities in a basement must be relocated to a safe area.



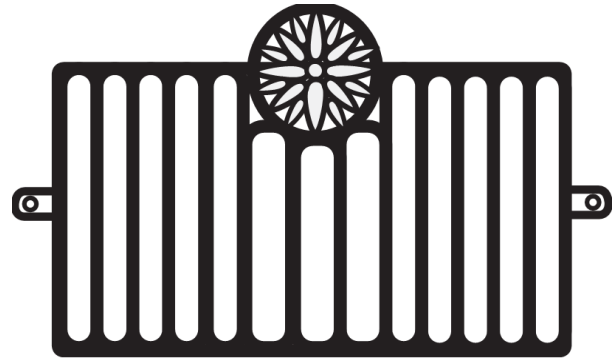
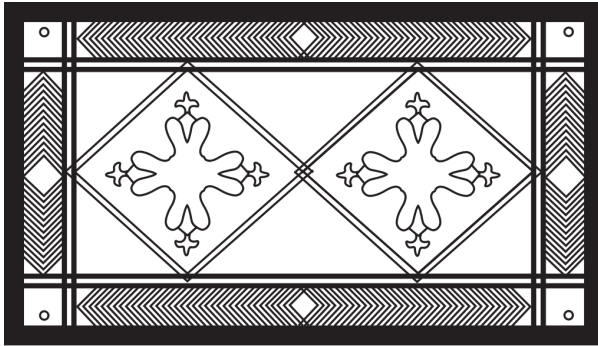
In a flood, water pressure can result in interior flooding and damage (left) while wet flood proofing allows the water to enter and exit via flood vents (right).



If wet flood proofing is considered, utilize existing openings such as basement windows for the installation of flood vents if the opening is at least one-foot above grade (Above: 39 Washington Street, Below: 11 Third Street).



- If front elevation flood vents are required, these may include decorative iron vents/grilles. They may be minimized by skirt board/water table, landscaping, elevated planters, staircases, etc. Use of creative openings/windows to break up wall expanse is also encouraged.



Decorative flood vents such as these types of designs may be used if required on the main façade of buildings.



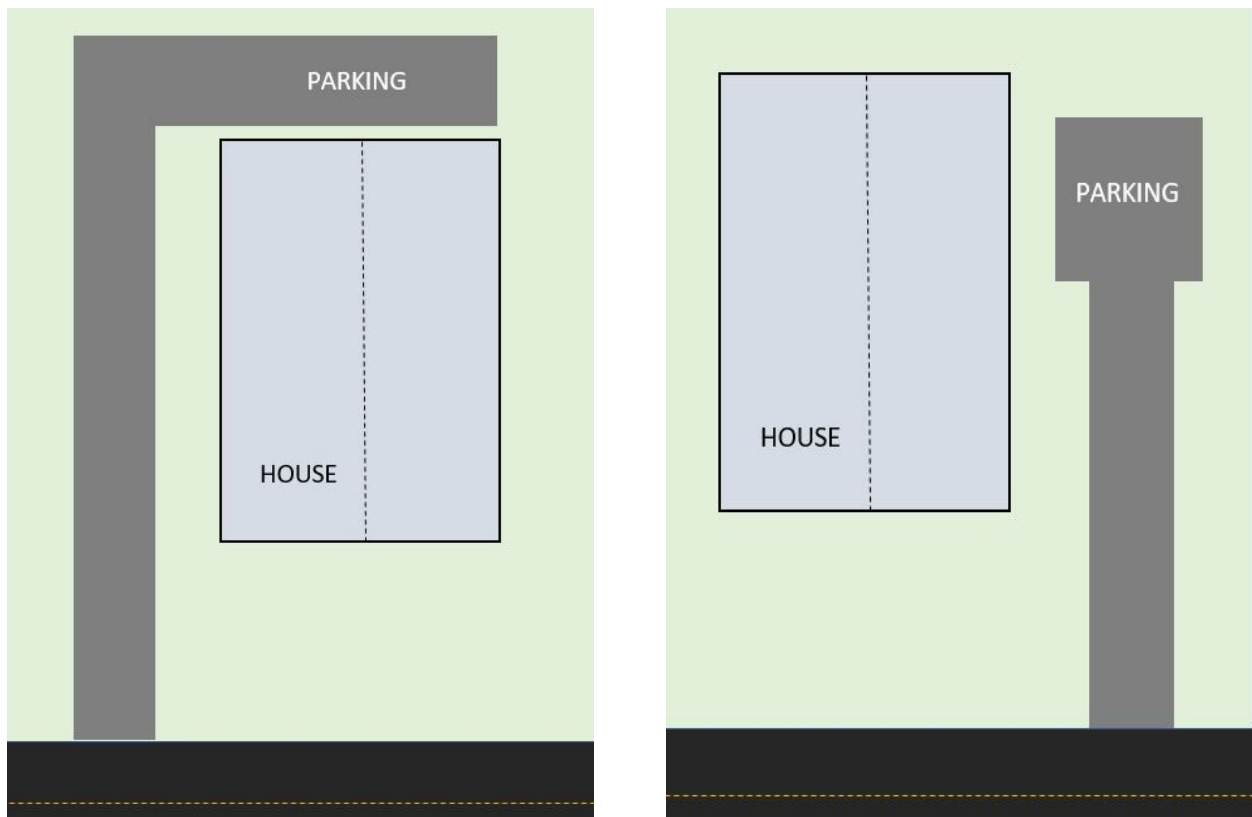
YES: *The use of blind openings in foundations provides consistency with window openings above and breaks up an otherwise blank wall at the street level (Charleston, South Carolina).*

FOUNDATION DESIGN CONSIDERATIONS

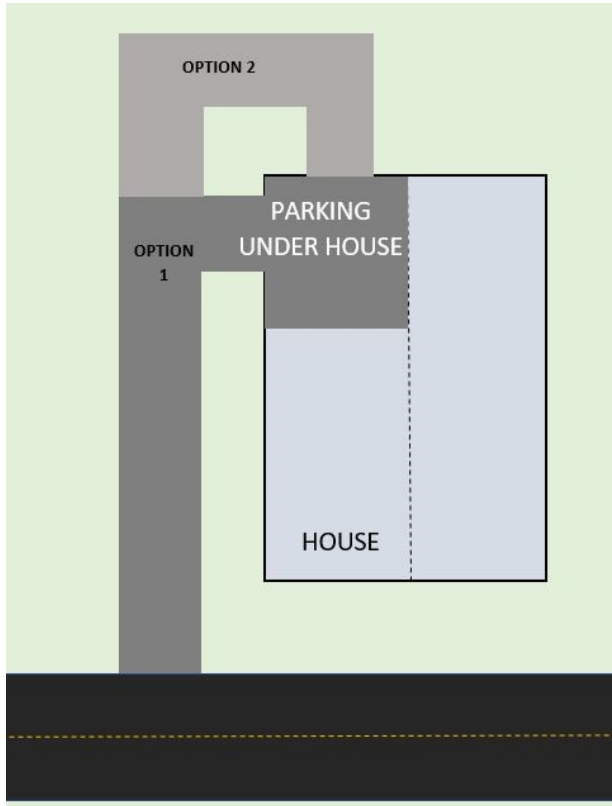
PARKING DESIGN

- Parking underneath elevated contributing buildings is not permitted

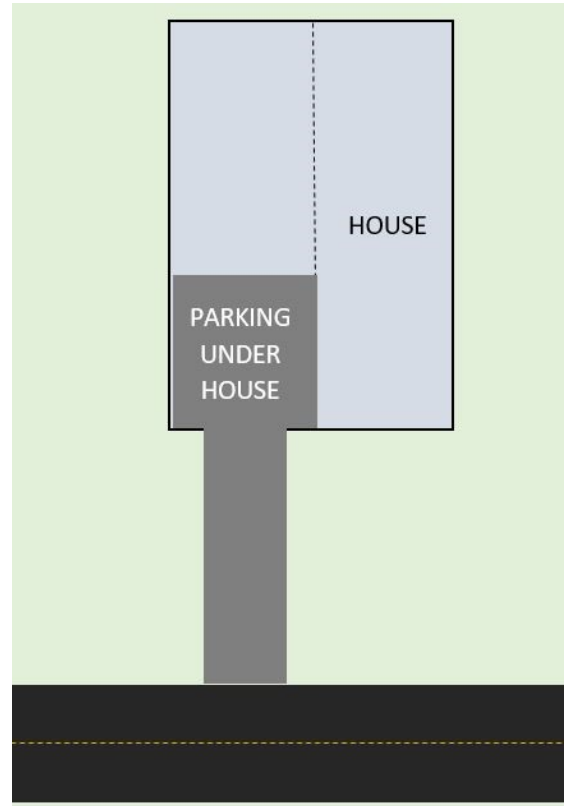
- Parking underneath elevated non-contributing and new construction buildings may be considered depending on proposed design and context of the surrounding historical neighborhood
- For non-contributing buildings and new construction, garage doors on front elevations are prohibited
- The installation of permeable surfaces for driveways and parking areas is encouraged for water absorption



YES: Houses that contribute to the character of the historic district and are elevated may have parking added at the rear (left) or side (right) of the property.



CONSIDERED: Non-contributing properties and new construction may have parking allowed under the house depending on the site and visibility from the public right-of-way.



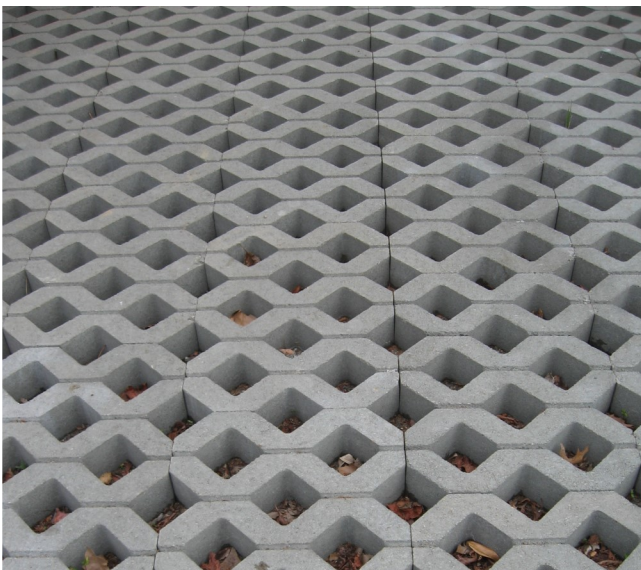
NO: Non-contributing properties and new construction are prohibited from having front loaded driveways and parking beneath the house on the primary façade.



NO: Front loaded driveways and garages are not approvable for elevated houses in the historic district (Charleston, South Carolina, photo courtesy Dennis Dowd).



YES: Property owners are encouraged to use permeable materials for driveways such as gravel instead of hard surfaces like concrete or asphalt (left). Another approach is to only hard surface the driveway “ribbons” as shown at right (Nantucket, Massachusetts).



YES: Permeable pavement materials should also be considered for new or replacement parking areas to limit water runoff and ponding (Charleston, South Carolina).



YES: The elevation project at 78 Bridge Street included the installation of a gravel parking area (above) and a driveway designed to absorb water runoff (below).



PRESERVATION AND ARCHITECTURE CONSIDERATIONS

- Quality of historic materials and detail shall be maintained throughout.
- Historic, character-defining features should be retained first, salvaged and reused second, or rebuilt in-kind when necessary as a last option.



Elevation projects should preserve and maintain character-defining features and materials such as the door detailing at 54 Washington Street (left) and 32 Second Street (right).

- **Chimney options (in order of preference):**
 - **Preferred method: retain chimney and elevate with the structure**
 - **Elevate the house around the chimney and extend the chimney accordingly with materials to match**
 - **Other chimney options require an engineering report and recommendation**



The elevation of this dwelling included rebuilding the base of the chimney with brick and mortar to match the original (Beaufort, South Carolina).



Most chimneys in the Newport Historic District are of brick and are located on the interior rather than on exterior walls. In an elevation project these chimneys should be elevated along with the rest of the house and kept at their original locations (above, 59 Bridge Street and below, 54 Thames Street).



- Primary entries should maintain the existing door locations and pathways to the street.



The locations of primary entrances as well as pathways should be maintained in any elevation project (above 41 Walnut Street and below 59 Poplar Street.)



- **Employ architectural strategies relating to the specific context to lessen the overall impact of the raised structure:**
 - **Continue siding down foundation**
 - **Lowering the window level to relate to streetscape pattern and pedestrian scale on new buildings. This pertains only to non-contributing and new structures**
 - **Add a skirt board/water table**



The elevation of 74 Bridge Street included the addition of a wide water table between the foundation and wood siding.



The dwelling at 14 Third Street displays a wide skirt board which would be appropriate for an elevation project.

- Significant elevation changes without site adjustment or mitigation should create the appearance of an additional full floor that proportionally relates to the floors above and fenestration patterns on the streetscape.



(Above) 57 Poplar Street reflects its window design from the first floor to street level. (Below) The front cladding at 28 Elm Street was significantly extended to give the appearance of a lower first floor relative to the street.



UTILITIES AND ACCESS CONSIDERATIONS

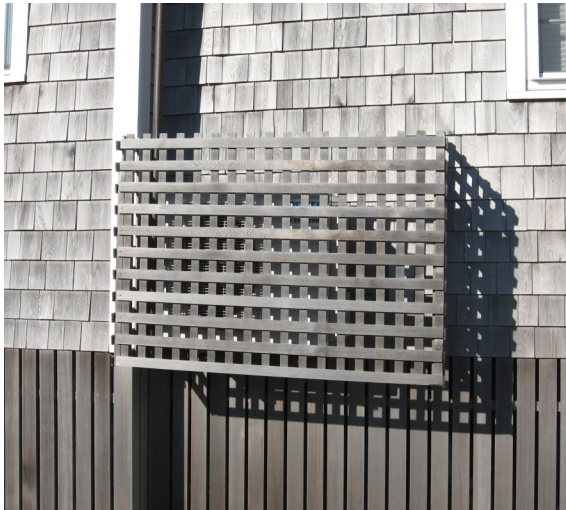
- Utilities such as heating and cooling units should be removed from basements or the first floor and installed above the base flood elevation level.
- Utilities may be added at the rear or sides of buildings not readily visible from the street. Utilities may be attached to buildings or placed on free-standing platforms.



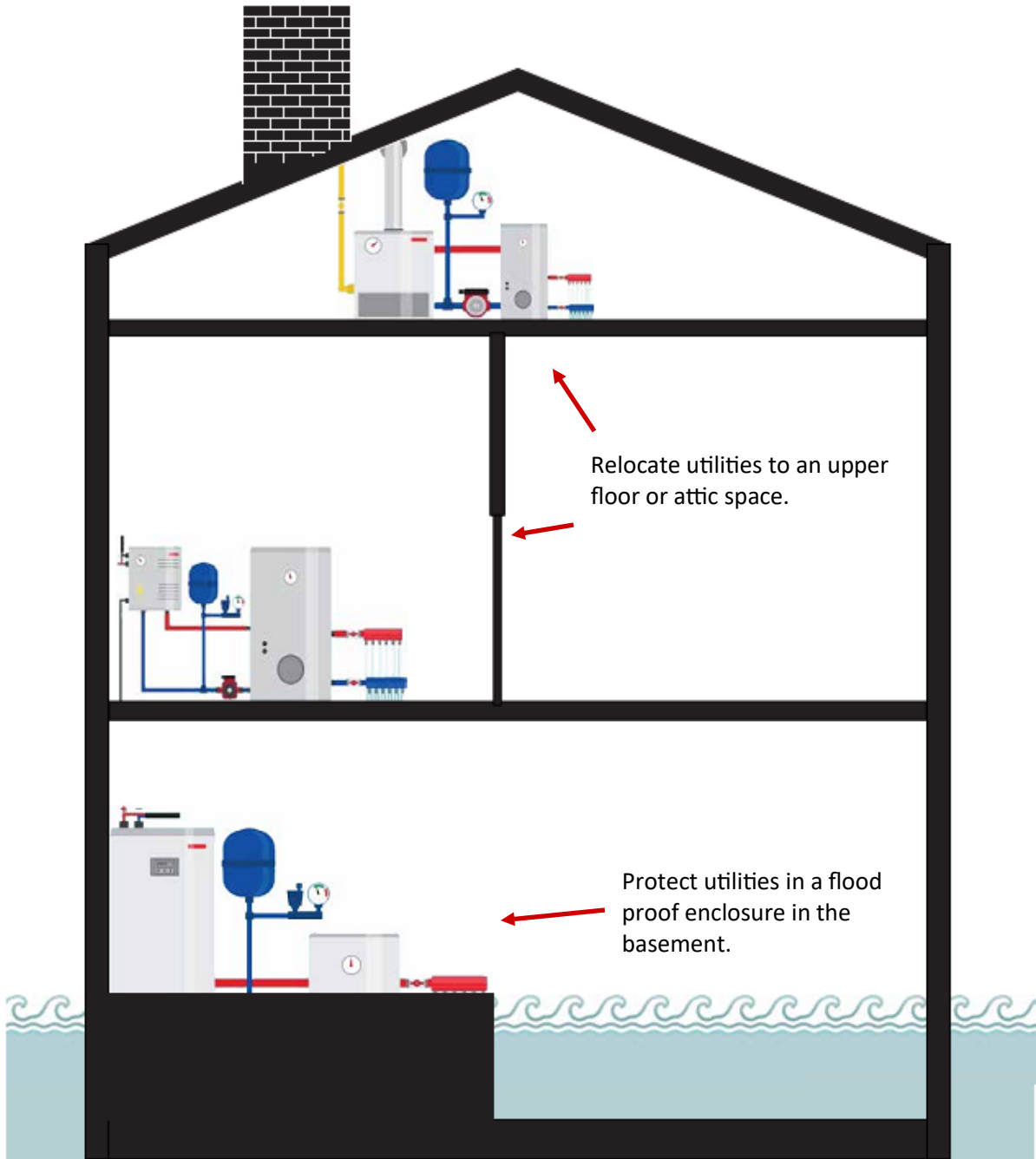
Appropriately sited and screened HVAC unit on the second floor rear porch at 62 Washington Street.



Appropriately sited and screened HVAC unit on the second floor rear porch at 52 Second Street.



Screening of utilities may include the use of lattice panels (left) or traditional railing designs (right). In both projects the utilities were placed at the rear elevations (left, Nantucket, Massachusetts and right, Mandeville, Louisiana).



Utilities should be protected in basements with flood proof barriers or relocated to first floor enclosures or attic spaces.



Some low-elevation projects may be able to utilize ADA ramps on the primary façade. Such ramps should be in traditional designs and screened (Nantucket, Massachusetts).



These chair lift designs provide access from a dedicated ADA parking space and required only a small section of the porches to be removed (left, Georgetown, South Carolina, right, Nantucket, Massachusetts).

BUILDING ELEVATION RECOMMENDATIONS

The building elevation recommendations that follow represent “Best Practices” consistent with Newport’s “Design Guidelines for Elevating Historic Buildings,” from 2020 and the National Park Service’s *Standards on Flood Adaptation for Rehabilitating Historic Buildings* published in 2021. Both low-elevation (up to four feet) and high-elevation (seven to nine feet) examples are depicted. The actual height that property owners choose for raising their building will depend on their current elevation and the final Design Flood Elevation (DFE) desired. Property owners should consult the existing flood zone data for their building prior to undertaking a Certificate of Appropriateness for review by the HDC.



32 Second Street

1/8" = 1'-0"



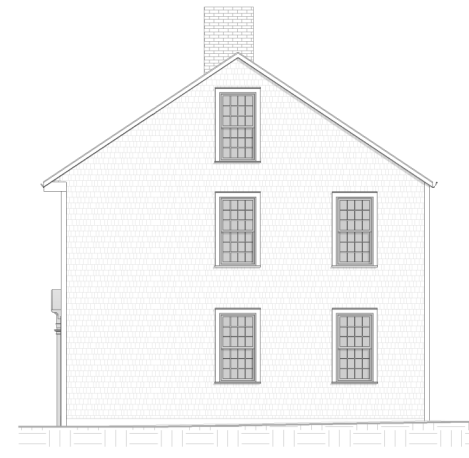
EXISTING HOUSE PHOTO

Elevate to 7'

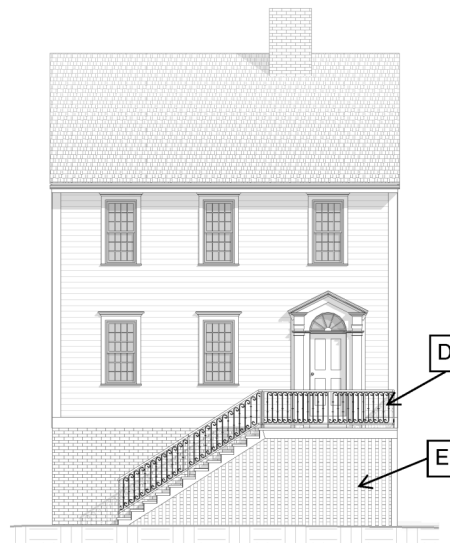
- A. Move Building Back on Lot
- B. Rebuild Brick Foundation
- C. Add Flood Vents
- D. Rebuild and Extend Stair
- E. Add Lattice Panels to Rebuilt Stair
- F. Preserve and Elevate Chimney



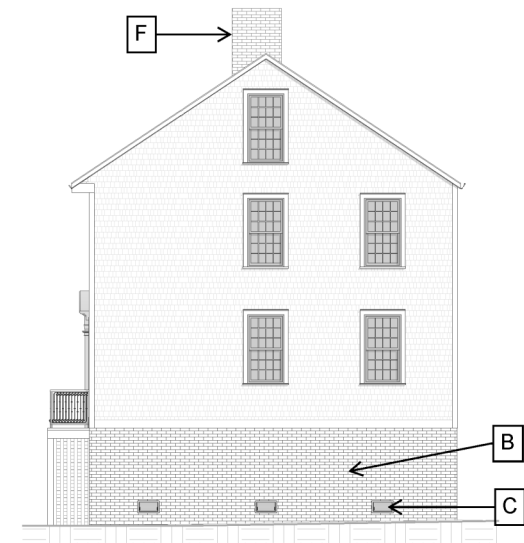
EXISTING EAST ELEVATION



EXISTING NORTH ELEVATION



PROPOSED EAST ELEVATION



PROPOSED NORTH ELEVATION

35 Washington Street

1/8" = 1'-0"



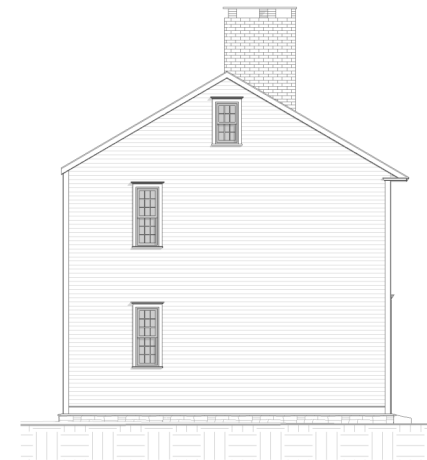
EXISTING HOUSE PHOTO

Elevate to 4'

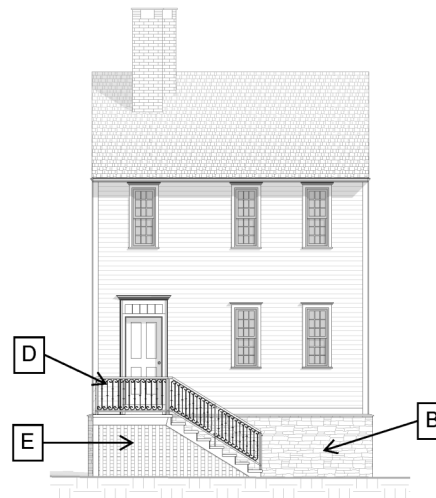
- A. Move Building Back on Lot
- B. Rebuild Stone Foundation
- C. Add Flood Vents to Side Elevations
- D. Rebuild and Extend Stair
- E. Add Lattice Panels to Rebuilt Stair
- F. Preserve and Elevate Chimney



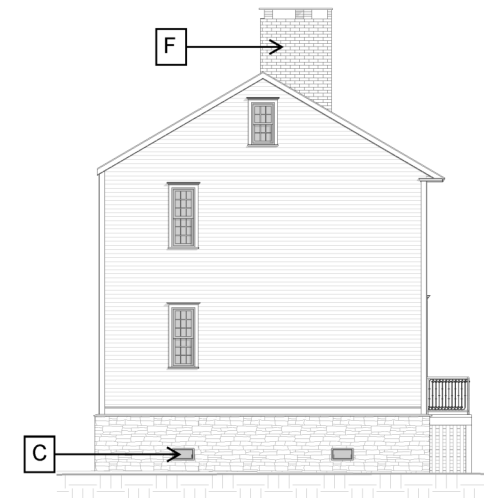
EXISTING WEST ELEVATION



EXISTING NORTH ELEVATION



PROPOSED WEST ELEVATION



PROPOSED NORTH ELEVATION

47 Poplar Street

1/8" = 1'-0"



EXISTING HOUSE PHOTO



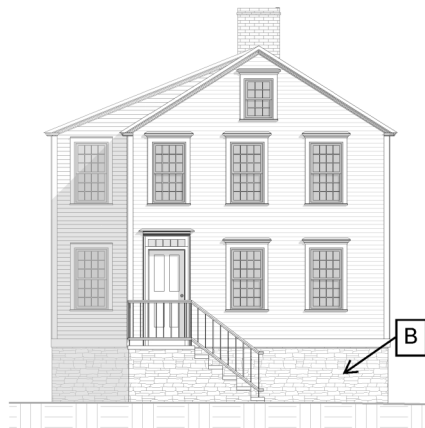
EXISTING SOUTH ELEVATION



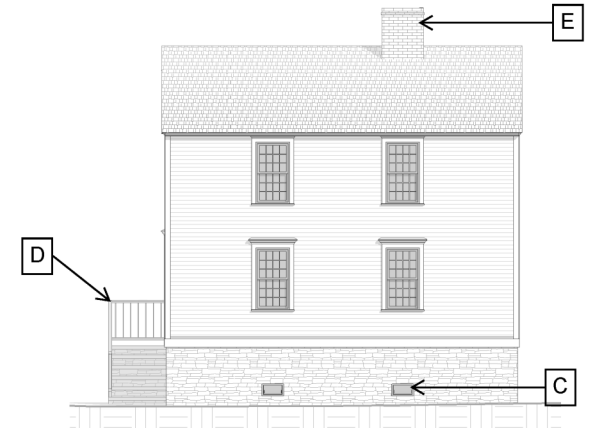
EXISTING EAST ELEVATION

Elevate to 4'

- A. Move Building Back on Lot
- B. Rebuild Stone Foundation
- C. Add Flood Vents to Side Elevations
- D. Rebuild and Extend Stone Stair
- E. Preserve and Elevate Chimney



PROPOSED SOUTH ELEVATION



PROPOSED EAST ELEVATION

11 Third Street

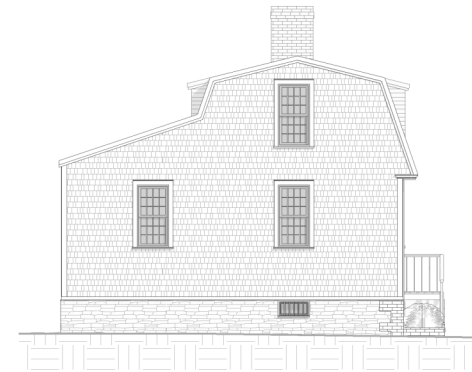
1/8" = 1'-0"



EXISTING HOUSE PHOTO



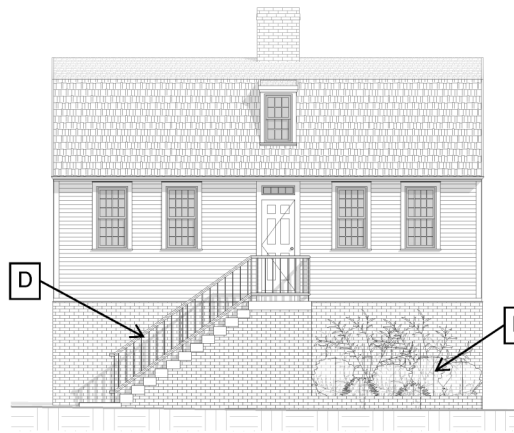
EXISTING WEST ELEVATION



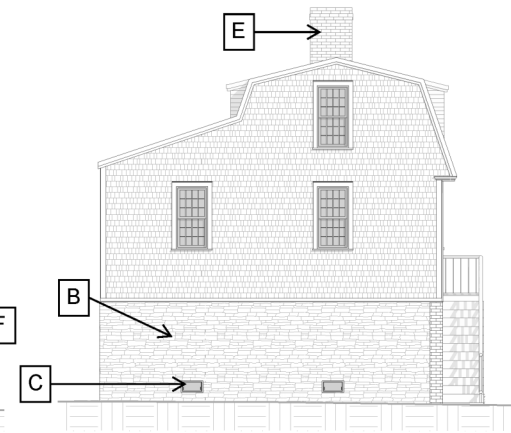
EXISTING NORTH ELEVATION

Elevate to 7'

- A. Maintain Building Footprint
- B. Rebuild Stone and Brick Foundation
- C. Add Flood Vents
- D. Rebuild and Extend Brick Stair
- E. Preserve and Elevate Chimney
- F. Add Landscaping



PROPOSED WEST ELEVATION



PROPOSED NORTH ELEVATION

23-25 Third Street

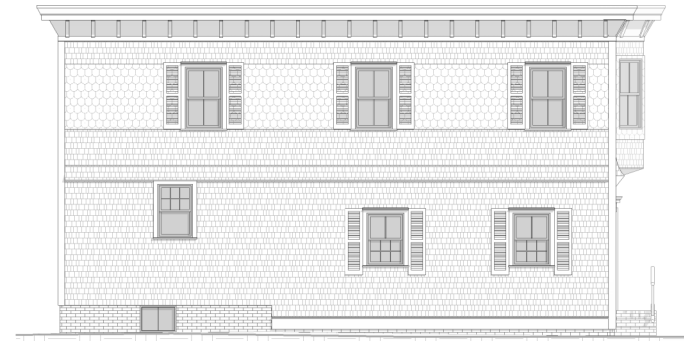
1/8" = 1'-0"



EXISTING HOUSE PHOTO



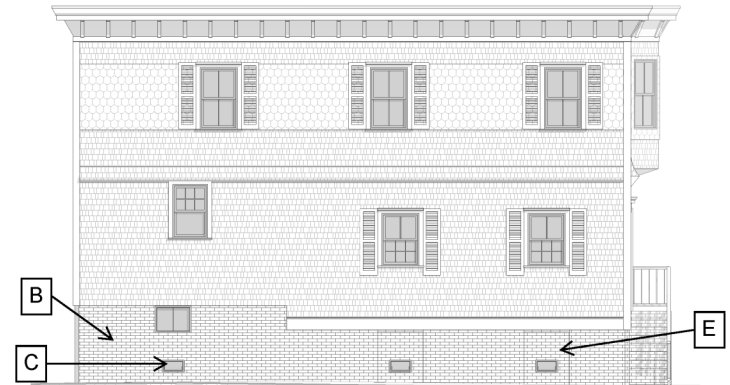
EXISTING WEST ELEVATION



EXISTING NORTH ELEVATION



PROPOSED WEST ELEVATION



PROPOSED NORTH ELEVATION

Elevate to 4'

- A. Maintain Building Footprint
- B. Rebuild Brick Foundation
- C. Add Flood Vents
- D. Rebuild and Extend Brick Stair
- E. Add Recessed Brick Panels

67 Thames Street

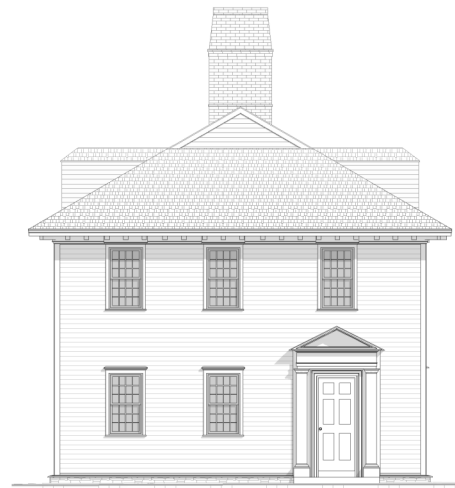
1/8" = 1'-0"



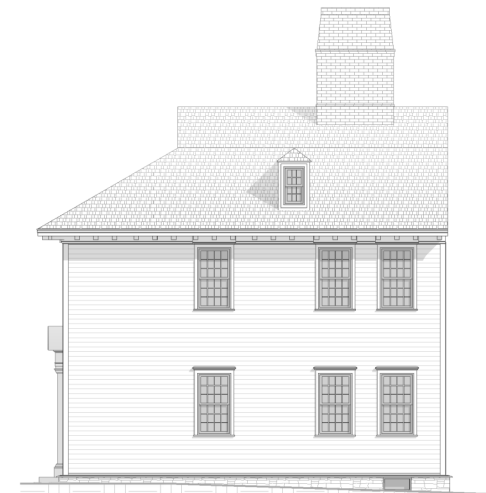
EXISTING HOUSE PHOTO

Elevate to 7'

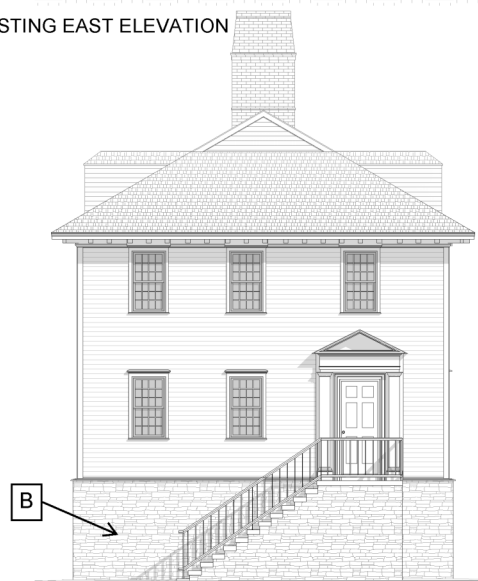
- A. Move Building Back on Lot
- B. Rebuild Stone Foundation
- C. Add Flood Vents to Side Elevations
- D. Rebuild and Extend Stone Stair
- E. Preserve and Elevate Chimney



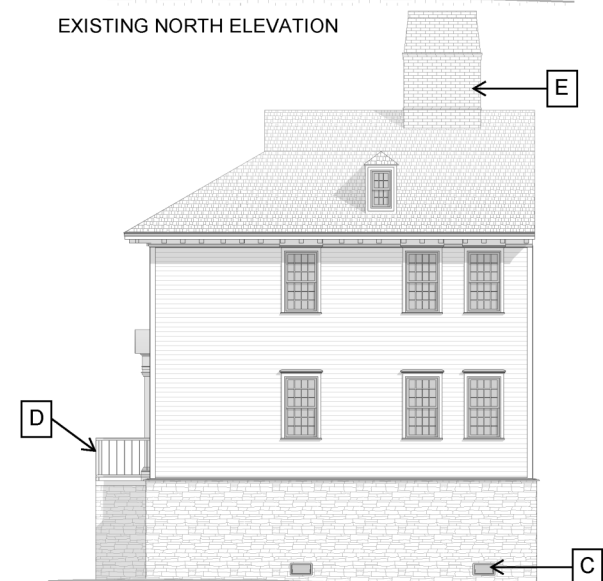
EXISTING EAST ELEVATION



EXISTING NORTH ELEVATION



PROPOSED EAST ELEVATION



PROPOSED NORTH ELEVATION



EXISTING ELEVATIONS STREETSCAPE



MIXED ELEVATIONS STREETSCAPE



RAISED ELEVATIONS STREETSCAPE

COMMERCIAL BUILDING CONSIDERATIONS

- A number of commercial buildings in the Newport Historic District are also at risk of flooding and may be elevated in keeping with the guidelines.
- Storefronts and first floors can be “hardened” through the installation of flood shields and barriers or by adding flood-resistant materials.
- Elevated commercial buildings may have the ability to increase the first floor level as a flood proofing method.



The commercial building at 86 Thames Street retains original brick bulkheads at the storefront which provides some flood resistance. Flood shields could be deployed to protect the entrances.



The commercial building at 78-80 Thames Street has frame bulkheads which could be protected by flood shield panels.



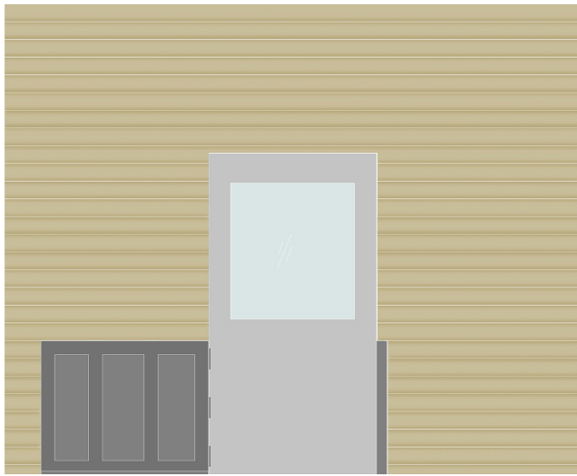
Commercial buildings in the Newport Historic District which may require elevation include 27 Second Street (above). The commercial building shown below was elevated by increasing the grade height, adding a new brick foundation and new stairs. An ADA compliant ramp and entrance was added at the rear (Cedar Rapids, Iowa, courtesy of Chris Wand).



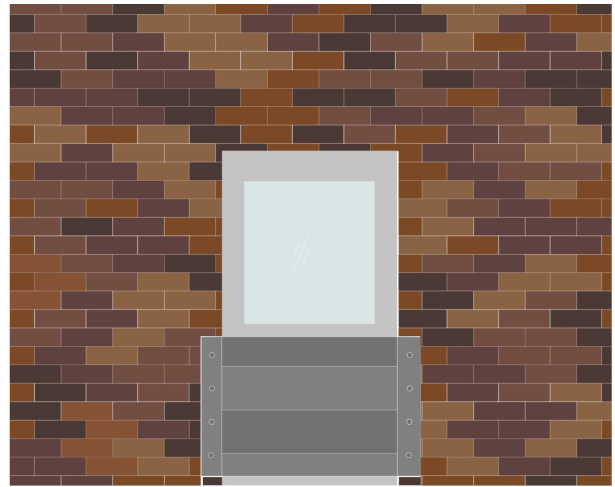


Commercial buildings at risk for flooding include those in the 100 and 200 blocks of Thames Street. Property owners should consider resilient measures such as flood shields or adding flood-resistant materials to the storefronts (above 140 Thames Street, below 212 Thames Street).

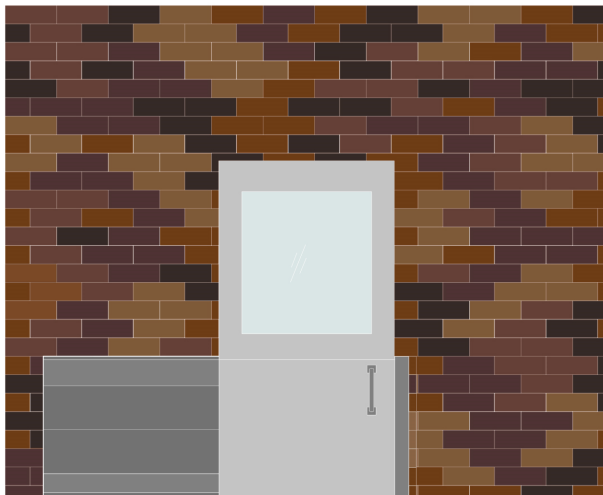




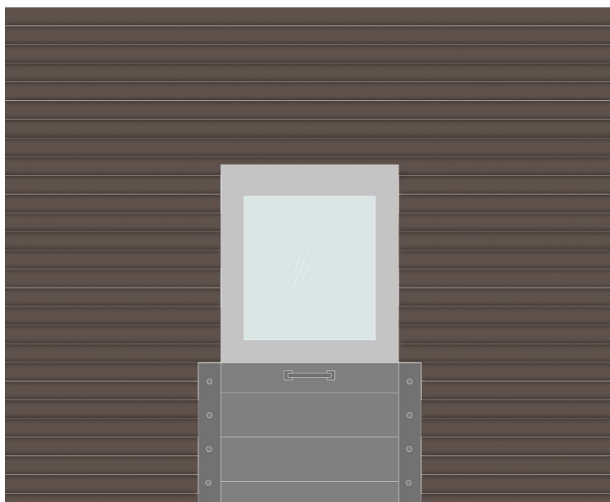
HINGED SHIELD



SHIELD AND SHIELD TRACK



SLIDING SHIELD



LIFT OUT SHIELD



Examples of flood shields to protect entrances. The photo above shows a shield and shield track in deployed position (Venice, Italy).



Flood shields for commercial buildings can be stored in the building as shown above and then deployed to protect the building during periods of high water (below) (New Bern, North Carolina, courtesy of the North Carolina State Historic Preservation Office).





The rehabilitation of this historic commercial building included the hardening of the bulkheads (the panels beneath the display windows) through the replacement of the wood panels with concrete and a parged surface to withstand flooding (Brunswick, Georgia).

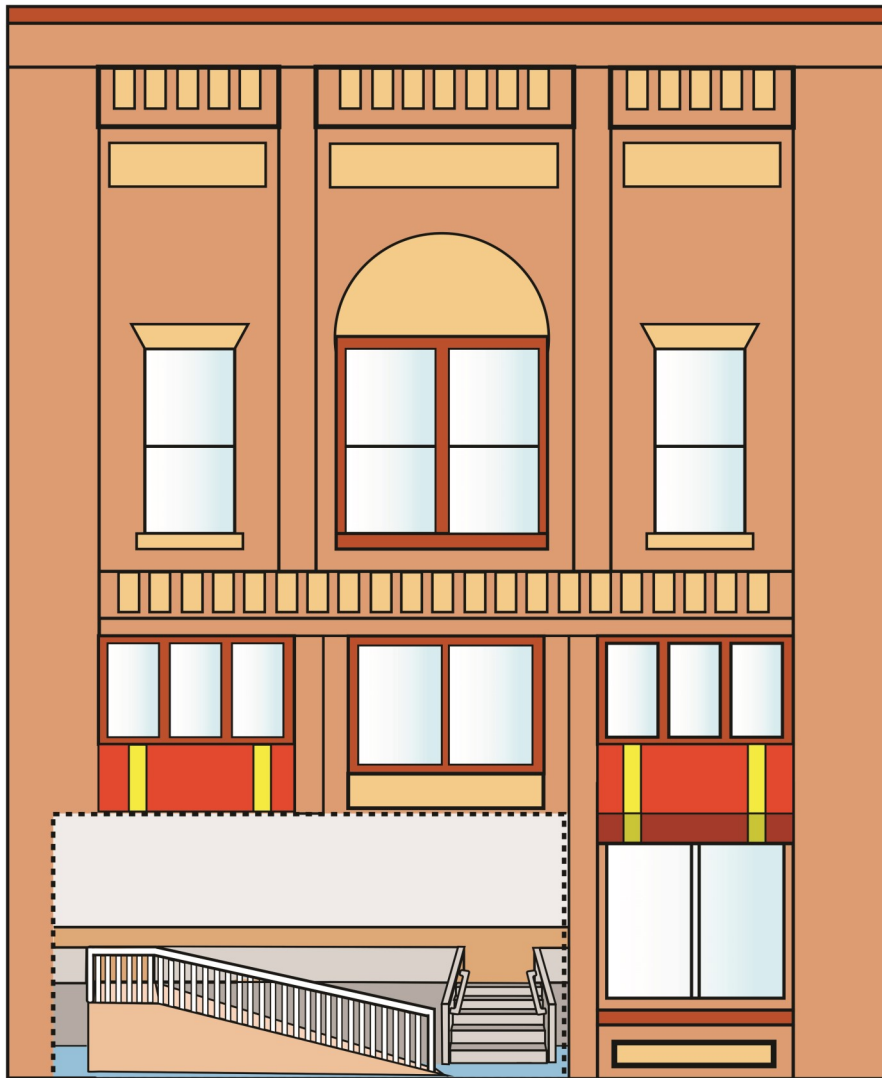




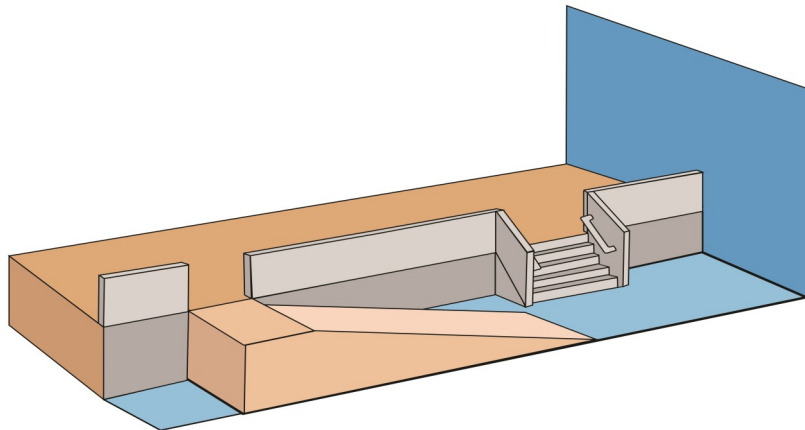
Another strategy for dry proofing commercial buildings is to harden the storefront and raise the interior first floor level. In this approach the frame storefront bulkheads are replaced with concrete and a parged surface (above).



After entering the business, shoppers can either go up the ADA compliant ramp (left) or go up the stairs to the new first floor level (right). The entrance area has been retrofitted with flood resistant materials including a tile floor and tile surfaces on the stairs (Darlington, Wisconsin, photos courtesy of FEMA).



This illustrates the concept for raising the first floor of a commercial building. After entering the storefront, shoppers can either go up stairs to the new first floor level or use an ADA compliant ramp.





New commercial buildings in the flood zones should be designed with hardened storefronts such as the concrete bulkheads and elevated first floors on these buildings. ADA compliant entrances are located on side elevations (Brunswick, Georgia).



ELEVATION AND RESILIENCE RESOURCES

FEMA Technical Bulletins

Technical Bulletin 0: User's Guide to Technical Bulletins (July 2019)
Technical Bulletin 1: Openings in Foundation Walls and Walls Of Enclosures (2008)
Technical Bulletin 2: Flood Damage-Resistant Materials Requirements (August 2008)
Technical Bulletin 3: Non-Residential Floodproofing - Requirements and Certification (1993)
Technical Bulletin 4: Elevator Installation (November 2010)
Technical Bulletin 5: Free-Of-Obstruction Requirements (August 2008)
Technical Bulletin 6: Below-Grade Parking Requirements (1993)
Technical Bulletin 7: Wet Floodproofing Requirements (1993)
Technical Bulletin 8: Corrosion Protection for Metal Connectors in Coastal Areas (1996)
Technical Bulletin 9: Design and Construction Guidance for Breakaway Walls (June 2019)
Technical Bulletin 10: Ensuring That Structures Built on Fill in or Near Special Flood Hazard Areas Are Reasonably Safe from Flooding (May 2001)
Technical Bulletin 11: Crawlspace Construction (November 2001)
Floodplain Management Bulletin, Historic Structures, FEMA-P-467-2 (May, 2008)
Floodproofing Non-Residential Buildings, FEMA P-936 (July 2013)
Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning, State and Local Mitigation How-To Guide, FEMA 386-6 (May, 2005)
Protecting Building Utility Systems from Flood Damage, FEMA P-348, Edition 2 (February 2017)
National Flood Insurance Program, Flood Insurance Manual, FEMA (April, 2020)

FEMA Fact Sheets

Community Rating System (June 30, 2017)
Historic Structures and The Biggert-Waters Flood Insurance Reform Act of 2012
Historic Preservation and Cultural Resources: Protecting Our Heritage (July 2016)
Technical Fact Sheet 1.2: Summary of Coastal Construction Requirements and Recommendations
Technical Fact Sheet 1.6: Designing for Flood Levels Above the BFE.

American Society of Civil Engineers

Flood Resistant Design and Construction Standards, ASCE 24-14, 24-17

Federal, State and Community Resources

Boston Resilient, Historic Buildings Design Guide. City of Boston.
Buoyant City, Historic District Resiliency & Adaptation Guidelines. City of Miami Beach.
Design Guidelines for Elevating Historic Buildings. Charleston, South Carolina
Disaster Mitigation for Historic Structures: Protection Strategies. Florida Department of State, Division of Historical Resources.
Elevation Design Guidelines for Historic Buildings in the Louisiana GO Zone. Louisiana Department of Cultural Development, Division of Historic Preservation.
Elevation Design Guidelines for Historic Homes in the Mississippi Gulf Coast Region, Mississippi Development Authority.
Elevation Guidelines for Historic Properties. New Jersey Historic Preservation Office, Department of Environmental Protection.

Guidelines on Flood Adaptation for Rehabilitating Historic Buildings. National Park Service.
St. Augustine Flood Mitigation Design Guidance for Historic Residences, St. Augustine, Florida.
Stockade Historic District, Flood Mitigation Design Guidelines, City of Schenectady, New York.