A G E N D A
HISTORIC PRESERVATION COMMISSION BOARD MEETING
July 11, 2022 at 6:00 PM

Call to Order

Approval of Minutes

1.

Old Business

2. HPC Draft of Elevation Design Guidelines
3. Fort Screven Signage at North Campbell
4. Campbell Neighborhood Conservation District Outreach Planning
5. Program Guidelines and Procedures

New Business

6. HPC Communications and Outreach
7. HPC Branding/Logo

Announcements

8. Black History Trail
9. Lazaretto Coalition Meeting Report
10. Statewide HPC Conference

Adjournment

Tybee Island
HISTORICAL PRESERVATION COMMISSION
Meeting Minutes

Date & Time: June 13, 2022 6:00PM

Present: Holly Grell-Lawe, Cassidi Kendrick, Mike Goldberg, Spec Hosti, Maggie Wright, Mary Anne Butler, Marty Harrell, Michael Sergi

Absent: N/A

Observers: Dawn Shay, Forever Tybee, Gordon Matthews (Tybee Road Centennial)

Location: Burke Day Public Safety Building, Conference Room, 78 Van Horne Ave.

Call to Order
The meeting was called to order by Holly Grell-Lawe at 6PM. A quorum was present.

Approval of Minutes
1. **April Minutes-** Marty Harrell motioned, Mike Goldberg seconded.
2. **May Minutes**- Mike Goldberg motioned, Marty Harrell seconded.

Old Business
1. **Debrief on Virtual HPC Training-** Commission members discussed some of the topics covered in the virtual HPC training conducted in April. Mary Anne stated that she also completed the training, Cassidi will follow up to see if they will share her certificate. It was determined that a majority of the board has completed the training.
2. **Historic Preservation Month Recap**- 0 scavenger hunt cards have been turned in. The commission agreed that planning needs to take place earlier in the year to garner more support and success.
3. **North Campbell Neighborhood-** The commission continued the ongoing discussion of the conservation district in the North Campbell Neighbor. There was a motion to move forward with a communication and outreach program to the property owners in north Campbell neighborhood in regards to the conservation district. Mike Goldberg motioned, Marty Harrell seconded. Vote was unanimous. Mike and Holly will put together a one-page information sheet for neighborhood outreach. Other members of the commission will work together on a more generic outreach across the island through social media and email. The commission would like for us to make a HPC instagram page.

New Business
1. **Fort Screven Signage-** Fort Screven sign at Campbell and Van Horne is falling apart. Jan Will mentioned it to the City Manager that it needed repairs. Cassidi will follow up with the Assistant City Manager to see about the repair process. Mike G. volunteered to repair the roof of the sign on behalf of HPC/ Cassidi will follow up with DPW on repairs.

2. **Program Guidelines/Procedures-** HPC has the authority to create their own guidelines and procedures for operations of HPC business. Attendance guidelines, training, annual planning and agenda items protocol were discussed as part of these new proposed guidelines. Cassidi and Maggie will work on the draft branding and guidelines.
3. **Permit Review-**
    a. 104 17th Street; Possibly going to be moved if all requirements can be met.
    b. 1513 Chatham Ave- recently purchased and the new owner has reached out to the Historic Society for doing a full tax credit project.
    c. 708 Butler- No update on paperwork being signed.

Announcements

Lazaretto Coalition Meeting- Mary Anne is the representative from HPC at these meetings. The Coalition is a very active group. They are working on getting a historical marker at the Lazaretto as well as storyboards and guest speaker presentations. Meetings are on the first Monday each month at 4PM at the Lighthouse.

Tybee MLK- Juneteenth celebrations at the Pier on June 18-19. There will be artists and musicians on the pier from 11am-7pm. The wade-in will take place on south beach on Sunday at 9-10:30AM.

Tybee Road Centennial- Gordon Matthews shared information on the original construction of Tybee Road, which is turning 100 next year. Cassidi will email the report he shared via email.

Administrative Updates- City Hall was placed on the National Historic Register. Sarah mentioned maybe we could invite someone from City Leadership to speak at a future meeting to discuss historic preservation in the City Hall renovation. Holly & Mike are working on Historic Elevation Guidelines.

Adjournment

Meeting adjourned at 7:37PM.

CITY OF TYBEE ISLAND
HISTORIC PRESERVATION COMMISSION
ELEVATION DESIGN GUIDELINES FOR HISTORIC BUILDINGS

1ST DRAFT 7/6/2022
NOT FOR PUBLICATION OR FURTHER DISTRIBUTION
BEFORE REVIEW AND APPROVAL BY THE HPC

Table of Contents

1. INTRODUCTION

Intent

The intent of these Guidelines is to conserve the historic character of Tybee Island's architecture, where possible, by integrating both traditional and innovative elevation design approaches in a sensitive manner. Tybee Island has historically been plagued by significant flooding issues in its low-lying areas in part due to development on filled-in land where marshes once stood. However, in recent years there has been an intensification of flooding from hurricanes, severe storms and high tides. With environmental factors changing very quickly, the preservation community's response must be proactive instead of reactive. The City of Tybee Island's Historic Preservation Commission (HPC) has concluded the best policy for the long-term preservation of historic buildings is to support elevating buildings to Federal Emergency Management Agency (FEMA) requirements, when necessary.

Purpose

Based upon the historic preservation and flood protection requirements established by the U.S. Department of the Interior (DOI) and FEMA, respectively, the purpose of these Elevation Design Guidelines is to inform local planning and building code officials, historic preservation representatives and property owners of elevation design principles to best ensure that historic properties are mitigated in a manner that protects their historic features. The Guidelines represent a framework in which a range of potential elevation actions, each with their own planning considerations, may be evaluated to produce the best, individualized approach for a given historic building and/or historic district.

The information contained in these Guidelines is for any property owner's use in planning changes to historic buildings within a historic district, or to an individual historic building outside the boundaries of these districts. The information has been designed to:

- provide helpful elevation guidance to any property owner considering elevating their historic or older building, and
- assist and remind local planning and building code officials and HPC representatives of the issues they should consider when reviewing an elevation project.

Elevation Action Alternatives

Taking no action is one alternative in which the owner of a historic home elects not to raise the building above its present elevation. As described in a variety of FEMA publications (see Section 6 Resources), an owner may also elect to reinforce the existing foundation system for the house.

Another alternative includes raising the elevation of a historic residential structure in response to potential flood hazards. The extent of the elevation change needed to bring a building above the designated flood elevation will vary depending upon its location. In general, minimal changes in elevation or location are the preferred mitigation actions.

Responses to the regulatory requirements of building codes and local HPC precedents must be balanced as proposals or elevation changes are made. Property owners must work closely with local building code officials and historic preservation representatives to determine an appropriate elevation level and related methods to mitigate associated project impacts on historic buildings. Also, if property owners are seeking federal or state tax credits or grants, early discussions with the office providing the incentives are essential to achieving approval.

In choosing an action to protect a historic property from potential future flood damage—whether elevation or another mitigation measure—the property owner must understand that their property needs to continue to retain its historic integrity after rehabilitation and elevation in order to meet the "historic structure" criteria of the National Flood Insurance Program (NFIP). [Refer to Section 4 Foundation Design Guidelines and Section 6 Resources.]

Elevation Design Review Process

If a property is located within a locally-designated historic district, property owners should consult with the HPC and consider formal retention of a professional building elevation practitioner trained to assist in determining elevation design strategies.

Once a property owner has initiated the local building permit application process, the HPC will consider the potential impact of elevation on historic properties.

Early coordination with local officials and design consultants will provide crucial site planning, architectural, and engineering assistance and information for use in developing the elevation proposal. If a property is within the jurisdiction of the HPC, the elevation plans will be referred to the HPC for review. If approved by the HPC, a Certificate of Appropriateness (COA) will be awarded to the property owner. For buildings located within a local historic district, the building permitting office may deny a building construction permit if a signed COA has not been issued by the HPC.

How to Complete a Successful Elevation Project

The HPC understands that property owners are anxious to complete the repair and rehabilitation of their buildings so that they can move forward with their lives. These Elevation Design Guidelines are used to facilitate the decision-making process to successfully complete the required historic

preservation review, allowing elevation projects to be funded in a manner that achieves both risk reduction and preservation of irreplaceable historic buildings and districts.

To further protect the physical integrity of an historic house and ensure that it will continue to maintain the characteristics for which it was designated as historic at the local level, the property owner(s) must have their project reviewed and approved by the HPC.

If the building is in a National Register Historic District and the owner is not applying for historic tax credits, the plans should also be reviewed by the Georgia Historic Preservation Division's (HPD) National Register Coordinator to determine if the elevation will impact the National Register status of the house. Written feedback would be provided and should be shared with the HPC where appropriate. Based on the individual elevation plan for an historic building, the HPC will issue a COA to the property owner and local building department as verification that the elevation project complies with local historic district guidelines.

After the property owner has submitted an individual elevation plan, the local HPC has issued a COA, and a building permit has been approved, the property owner may proceed with the building elevation.

Organization of These Elevation Design Guidelines

These Guidelines include six report sections, each of which is summarized briefly below. HPC's intent is to provide essential information for the property owner to use to develop an individualized elevation design project that addresses the broad principles outlined in the Secretary of the Interior's Guidelines and in the Standards for Rehabilitation ("Standards"). The intent of the Standards is to assist the long-term preservation of a property's significance through the preservation of historic materials and features. The Standards pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of the buildings.

In addition to Section 1 Introduction, this document is organized by the following topic areas:

Section 2: Site Design Guidelines
Provides information about the site on which the historic building is located.

Section 3: Architectural Design Guidelines
Discusses considerations regarding neighborhood design context, evaluating elevation alternatives and goals for new screening and scale minimization.

Section 4: Foundation Design Guidelines

Identifies engineering factors for designing new foundations for elevated buildings and includes detailed illustrated approaches to foundation screening.

Section 5: Elevation Construction
Provides a guide to the basic steps in building elevation and describes the most common elevation techniques, including extending existing piers or walls, whole house elevation, open foundation (piers, posts, columns, and pilings), slab elevation, slab separation, and wall extension.

Section 6: Resources
Includes National, State and Local reference materials for use in designing an elevation plan.

Users of these Elevation Design Guidelines are strongly encouraged to read the document completely and avoid the temptation of looking only at a few sections. Although certain portions of this guide may contain information pertaining to a specific issue, all sections contain essential information with which the user should become familiar.

2. SITE DESIGN GUIDELINES

Site Elevation and Topography

Determining the appropriate height to which a historic residence should be raised begins with establishing the site elevations associated with the existing property. A professionally produced property survey of the parcel, including a finished floor elevation for the residence, will provide initial data for the elevation design plans.

To prepare a customized elevation design plan, the property owner must first determine the existing elevation level of the historic home, and then secure information from the local building department regarding the recommended elevation level in conjunction with attaining a flood elevation certificate. FEMA flood elevation data and requirements, as well as local building codes, will specify the height to which the first floor should be raised. These new elevation standards are used by local and Federal authorities to limit impacts from future flood events. The property owner should then consult with the HPC and building permit offices to set an appropriate strategy for the new elevation proposal.

Parcel Configuration and Access

Planning an elevation design project requires a thorough understanding of the historic property's parcel configuration, boundaries, setbacks, and access. Parcel size and configuration determine the range of elevation design project alternatives and directly affect both the ability to accommodate any proposed site feature improvements and mitigate the visual impacts of the elevated structure on

surrounding historic buildings. Parcels with limited area and width will present greater design challenges than larger sites with ample front and side yard conditions and setbacks. Existing access to the parcel from both street and sidewalk should be evaluated for any elevation change that warrants new site circulation features. Special consideration should also be given to the relationship of the parcel to adjoining properties, especially if they are historic. Variances may be needed.

Parcel Layout

In developing a customized elevation design plan, the property owner should think about the following:

- Is sufficient space available within the parcel for new or expanded stairs? Elevating a residence requires construction of additional steps, and generally adds 11 inches to the length of stairs for each 7-inch increase in height.
- Is adequate space available on the parcel for new architectural or landscape screening elements to conceal new sub-story columns or piers? These features may require dedicated areas near the foundation of an elevated building.
- Is sufficient space available on the parcel to accommodate both new screening elements and existing site features, such as driveways and walkways?

Parcel Access

Any proposed changes to existing site access elements, such as stairs, porches, and walkways must carefully consider existing stairs, sidewalks, and driveway conditions. Property owners should evaluate the relationship of existing site features to proposed design elements by referring to:

- The parcel boundary
- An existing conditions survey
- Local zoning and building code requirements that establish development setbacks for residential uses

Building Footprint and Orientation

The existing location of a historic structure within its property boundary is another factor that affects the flexibility of elevation design and related circulation design proposals. Front, rear, and side yard conditions affect the potential to provide modified entrance stairs and other exterior design features.

Some historic residential structures feature front entrance stairs and porches with side yard driveways. Because the depth of front yard conditions is generally limited and the location of driveways are often

close to the residence, design challenges to elevating these structures and providing new entrance stair conditions within these front and side yards should be anticipated. These challenges can be addressed with new compact stair and landing layouts that have limited projections from existing entrance conditions. Any circulation improvement should be evaluated for its historic appropriateness.

The location of the building footprint within its site also influences the feasibility of any potential changes in the topographic elevation of the parcel. In some cases, property owners may consider raising the elevation of both site and building in order to address flood hazards. Building footprints located within central areas of larger parcels are better suited to accommodate changes in site grade levels. Front, side, and back yards with greater depths provide an opportunity for gradual transition between grade levels.

The size and orientation of a building footprint relative to the parcel's acreage affects potential elevation design screening approaches. New architectural and landscape treatments intended to visually screen a new residential base or sub-story are most effective on sites with sufficient front and side yard depths. Note that changes to the topographic elevation and/or footprint may require permits, and possibly approval from the local floodplain manager.

Adjoining Property Considerations

On parcels with limited space between residences, any change in the elevation of one structure affects the visual setting of another. Because the relative heights and proximity of existing structures establish the visual character of an historic district, elevation design proposals must carefully consider the heights and massing of adjoining structures.

Another consideration that should be kept in mind is that construction activity has the potential to alter drainage patterns, both for the subject property, and all neighboring properties. Potential impacts could arise from topographic changes, such as grading, the use of fill, or the creation of a berm or swale.

Accessibility Considerations

Providing accessibility at historic properties is a complex issue, and underscores the need to balance accessibility and historic preservation. The National Park Service's Preservation Brief 32, Making Historic Properties Accessible, provides guidance on making historic properties accessible while preserving their historic character.

An elevated building's new height may pose barriers to persons with disabilities, particularly to wheelchair users. A three-step approach is recommended to identify and implement accessibility modifications that will protect the integrity and historic character of historic properties.

- Review the historical significance of the property and identify character-defining features
- Assess the property's existing and required level of accessibility
- Evaluate accessibility options within a preservation context

Entrances

Whenever possible, access to historic buildings should be through a primary entrance. In historic buildings, if this cannot be achieved without permanent damage to character-defining features, at least one entrance should be made accessible.

Incorporating Ramps

Permanent ramps are perhaps the most common means to make an entrance accessible. As a new feature, ramps should be carefully designed and appropriately located to preserve a property's historic character. Ramps should also be located to minimize the loss of historic features at the connection points - porch railings, steps, and windows - and should preserve the overall historic setting and character of the property.

Considering a New Entrance

When it is not possible to modify an existing entrance, it may be possible to develop a new entrance by creating an entirely new opening in an appropriate location. This solution should only be considered after exhausting all possibilities for modifying existing entrances.

Parking and Circulation

In preparing an elevation design plan, present and proposed driveway and parking requirements must be considered. Minimize changes to parking and circulation that affect the historic setting.

Landscape Elements

Landscape screening should complement the architectural elements of the residence and represent part of an overall strategy for mitigating the effects of elevated structures. Use of indigenous landscape plantings to minimize the visual impacts of elevation is preferred.

Site Design Guidelines – Specific Recommendations

The following recommendations support overarching historic preservation goals and should be incorporated, whenever possible, into customized elevation plans:

- Retain and preserve building and landscape features that contribute to the overall historic character of the individual building and/or the historic district, including trees, gardens, yards, arbors, ground cover, fences, foundations, and significant vistas and views.
- Retain and preserve the historic relationship between buildings and landscape features of the district setting, including site topography, retaining walls, foundation plantings, hedges, streets, walkways, and driveways.
- Protect and maintain historic building materials and plant features through appropriate routine maintenance and repair of constructed elements and pruning and management of plantings.
- Protect large trees and other significant site features from construction activities and from delayed damage due to construction activities, such as loss of root area or compaction of soil by equipment. Avoiding compaction of the soil within the drip line of trees is critical to maintaining the health of root systems.
- Elevate your Heating, Ventilation, and Air Conditioning (HVAC), or any other exterior equipment, in a manner that is unobtrusive and inconspicuous to the extent possible. If possible, place this equipment in the rear of the building, or in a place where it can be readily masked or screened.

Actions that are inconsistent with established preservation goals and should be avoided are:

X Within historic districts, altering the residential character of the district by significantly reducing the proportion of built area to open space on a given site through new construction or additions.

X Introducing contemporary equipment or incompatible site features, including mechanical units, in locations that compromise the historic character of the building or historic district. Such features should be located unobtrusively, to shield them from view.

3. ARCHITECTURAL DESIGN GUIDELINES

Whether the property owner's historic residential property is situated within an historic district or it stands within the context of another setting, it is part of a distinct environment of related uses.

The arrangement of historic structures within their community represents a distinct pattern of cultural development that should be valued and preserved. Each elevation design plan should reflect an understanding of the overall context of the neighborhood.

As noted in Section 2 Site Design Guidelines, relative building heights, setbacks from local streets, and distances between homes are principal features that characterize residential neighborhoods. These features and their landscape elements contribute to the character of each neighborhood setting.

Property owners should identify elements of the local neighborhood character and integrate them in the customized elevation plan

Once elements of the neighborhood character are identified, options for integrating these elements into the elevation design should be developed for the residential site. Mitigating, or offsetting, damaging visual effects of elevating an historic residential structure will depend upon the extent of proposed elevation change, architectural treatments, parcel size and setbacks, distance between homes, and landscape screening measures.

Exploring and Evaluating Elevation Alternatives

Foundation Strengthening

This alternative is appropriate when the elevation height required for a specific parcel is minimal, and strengthening the foundation would save the property owner a considerable amount of money compared to other elevation alternatives.

Limited Elevation Change

This alternative will result in only a nominal visual effect on the historic character of the property, and can be achieved through:

- Minor changes in the existing ground level that will provide a modest elevation level of less than 4 feet for both the parcel and the residence. This approach maintains the physical relationship between the ground level and the residence.
- An increase to the base of the existing home of less than one story.
- A combination of the above, with a slight change in ground elevation and a slight increase in height.

Significant Elevation Change

Should we add text on this topic?

Composition and Scale

Elevation design plans should consider existing architectural composition and scale of historic features. The composition and scale of existing elements, such as multiple building levels, projecting wings, exterior columns, and the arrangements of doors and windows, provide design references for the location of any new entrance features, stair systems, and other sub-story elements.

The design of new elevated base conditions, whether they are open, enclosed, or screened through landscape plantings, should reflect, wherever possible, existing composition and scale features.

Existing façade elements should be integrated in the elevation design plan for the new base or sub-story levels by repeating, contrasting, or complementing elements.

Evaluating the scale of existing features is important, as the visual relationship between building features and the site may be changed significantly by an elevation design plan. Design efforts to manage the scale transition between the new elevation and existing grade will almost always require appropriate architectural and landscape treatments.

Elevation and Existing Facades – Design Considerations

An evaluation of elevation options for the principal design elements of an historic home should include consideration of its most important feature, called the façade, and its entryway. The façade faces the street, and is often the most-highly decorated of all building elevations. This feature establishes the building face, and sets the stage for the design of each adjoining façade.

Most historic façades feature a prominent and central location for the front entrance door, which may be further defined by entrance steps, porches, and adjoining windows. Other defining features include the size, extent, symmetry, and character of façade treatments and ornamentation. The elevation design plan should focus on these design elements to minimize visual impacts on the historic structure. New stairs and landings introduced to compensate for elevation changes must complement the design of the existing front façade, which may already include porch structures and related details.

Corner lots present interesting opportunities for architectural and elevation design, in that there are ordinarily two exposed sides of each building. As the design of the original structure would typically have taken this into account, the elevation design should also focus on both building “faces.” Every effort should be made to ensure the foundation, exterior stairs (and/or ramp), and landscaping plans include the exposed side of the building, as well as the facade.

Porch structures and associated roof, column, and balustrade elements provide design references that should be incorporated in elevation design proposals. Placement of new foundation, base and sub-story elements should also coincide with existing vertical references to porch columns and other repeating façade elements.

Placement of new structural supports should account for the location of prominent external façade design elements and reflect or complement existing repeating vertical elements on the façade, such as columns, posts, or other trim details. This approach promotes continuity of the historic design elements of the façade as they are expressed through the new base treatments, thereby minimizing the visual impacts of the new elevation change on the historic building, as a whole.

Other significant façade components, such as chimneys and major masonry features, require special consideration in an elevation design project. In order to maintain their historic and functional attributes, these masonry elements require continued physical connections to established grade conditions within the project site. Adapting major masonry features to address elevation changes may act to shape the overall strategy of an elevation design project.

Elevation and New Foundations – Screening and Scale Minimization Considerations

Appropriate measures to reduce or eliminate negative visual effects resulting from the elevation of a historic residential structure will depend upon the extent of the new elevation proposed and proportion of the new base area. When establishing the proposed elevation, the property owner and elevation design consultant should prepare plans that include appropriate screening and other treatments for the elevated residence.

Architectural and landscape screening approaches for new foundation conditions can provide effective means to mitigate the adverse visual effects associated with elevating a historic property. These approaches must carefully consider foundation requirements associated with relevant flood hazard zones. Architectural screening of open foundations must address potential flood and wind forces and consider their effect upon the historic character of the structure.

The proposed screening approaches for an elevation design plan should focus on providing new visual buffers to the elevated area. Related design approaches may also focus on providing new shielding elements that create a gradual transition for the space between the existing ground level to the new first floor level.

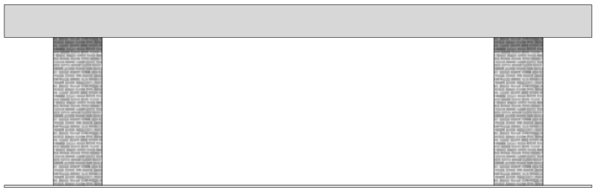
Because many architectural screening systems are prohibited in the highest hazards zones (V Zone), property owners and designers must determine at the outset whether an architectural screening system is practical or feasible. In other hazard zones, the use of open lattice screening panels and other non-structural breakaway façade panels for a new base or sub-story can offer effective means to buffer the changes in elevation to an existing structure.

These approaches can reduce the damaging visual effects of elevating an historic property in a manner that maintains or complements its character and setting.

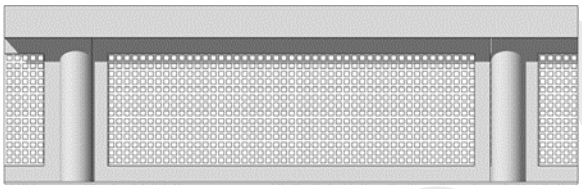
Existing façade features offer helpful architectural design references that can be repeated, contrasted, or complemented within the new base or sub-story levels in elevation design projects. Both architectural and landscape screening strategies can provide effective means to minimize the visual impacts on the historic residence.

For new base or sub-story proposals, architectural screening approaches may take the form of open or enclosed panels of various sizes. These panels can be designed to cover the newly elevated foundation areas. Small panel treatments may include new lattice patterns or other designs for projects requiring limited elevation changes.

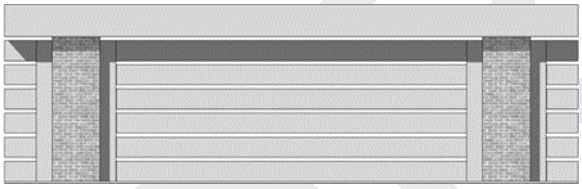
Architectural screening treatments for larger areas can be designed to convey features of the existing façade within the new sub-story zone. In each case, the panels must be designed as flow-through or breakaway structures that will not restrict potential flood waters. Incorporate screening and scale minimization measures to mitigate elevation visual impacts.



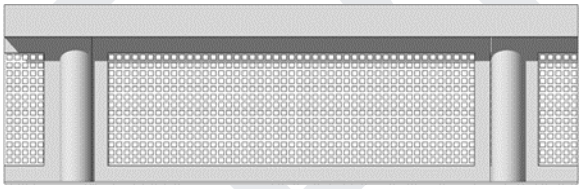
Elevation with no screen



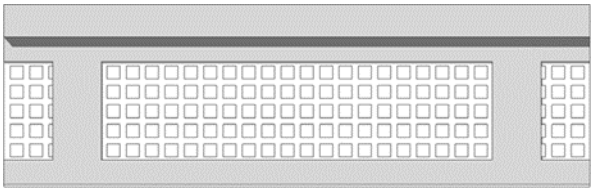
Elevation with lattice covering piers



Elevation with louver screen panel



Elevation with fine pattern lattice screen panel



Elevation with bold pattern lattice screen panel

The key considerations for foundation screening systems include: design provisions that allow unrestricted flows of rising flood waters, breakaway features that do not add wind loads to a structure, and design elements that provide a suitable architectural statement for the base or sub-story that complements the historic property.

FEMA's Technical Fact Sheet No. 27, Enclosures and Breakaway Panels, summarizes building code requirements and design considerations for these architectural screening systems.

To achieve scale minimization associated with higher elevation projects, several approaches are available to provide site transitions through both architectural and landscape treatments. Architectural approaches include new stair and landing designs that complement existing porches and entrances, while the landscape strategies include new foundation planting areas that provide visual buffers for the newly elevated areas.

Elevation design consultants can assist property owners in designing alternative treatments and selecting one that most successfully minimizes adverse effects on the historic building, while also reducing risk through some level of elevation. Elevation design plans that effectively incorporate screening and/or scale minimization measures to complement the architectural character of the historic building and historic district will generally be well received by the HPC.

Stair Considerations

For elevated historic buildings, exterior stairs are critical elements, not only in their design, materials, and workmanship, but in their spatial relationship to the rest of the building. When planning an elevation project, the owner of a historic property should consider engaging the services of a design consultant who will provide crucial architectural and engineering assistance. If a property is in a jurisdiction of the HPC, the reworking of any stairs will be subject to review by this body.

In general, the retention of existing stair configurations, where possible, is always recommended as the first option in an elevation project. Significant alterations to historic stair configurations usually result in substantial redefinition of a building's historic entrance, and the loss of historic character. Such alterations can complicate the HPC review process and result in denial of a COA. Because exterior stairs are frequently the single most dominant feature of an elevated building's exterior, care and attention must be given to their initial planning, design development, and materials selection. Lot size and configuration will also play a major role in the design for the stairs and entrance way.

Stair Design Guidelines – Specific Recommendations

- When possible, retain all significant existing stairs or portions of such stairs.

- Retain significant details of stairs, such as newel posts, balustrades, stringers, or other features.

- Extensions of stairs and new stair assemblages should be designed to be compatible with the historic stairs, in configuration, scale, materials, and detailing. Elevated historic buildings of similar type and style can help inform the owner and architect of the appropriate means and methods to extend existing stairs.

- Avoid the relocation of significant stairs to new locations or new configurations. Relocations, while they may preserve the historic materials, usually result in loss of the historic circulation pattern, and frequently involve loss of historic craftsmanship and architectural integrity.

- Some old stairs do not comply with current building codes. Rehabilitations of buildings with such stairways should be studied carefully so that the historic character of the building can be retained, while still satisfying the intent of the codes. Balustrades and handrails of insufficient height can be augmented without destroying significant materials.

- Where new stairways are considered in historic buildings, they should be located so that they do not require alterations to significant exterior or interior spaces or materials, thereby ensuring that the historic plan and circulation pattern remains intact.

- If new exterior stairways or elevator towers are proposed, the location, massing, and exterior finish should be planned so that the new work does not destroy or obscure significant historic features of the building. Some historic buildings are so arranged that new exterior stairways or elevators would inevitably diminish the historic character of the building.

- Almost all elevated buildings also have secondary staircases, typically placed on side or rear elevations. While these may have less distinctive designs than the main stair, all stairs are important in defining the character of these buildings, and should be given priority in preservation planning.

- Where historic stairs have been removed prior to the elevation undertaking, historical and architectural research should be conducted to determine what stairs are historically appropriate for the building's type and style.

Common Stair Configurations

Straight-Run Stair

The straight-run stair configuration is the most widely used form for low- and medium-height elevations. When it incorporates an intermediate landing (rest), this stair type is also well-suited for

some high elevations. Straight-run stairs, as the name implies, have no turns. By definition, the straight-run stair features a single, straight flight of stairs that connects two levels or floors in a building. In contrast, L- and U-Plan stairs require landings in between stair runs.

Straight-Run Stair Advantages

- Because of its simplicity, a straight-run staircase may be less expensive to build than other types of staircases such as an L- or U-Plan stair.
- A person moving up or down the stairs has a clear view of the entire flight.
- For a building undergoing an elevation, it is easy to accommodate extensions and modifications on a straight run stair.

Straight-Run Stair Disadvantages

- Straight-run staircases require more space as compared to curved or platform staircases. As a result, they typically are better suited to buildings with sizable front yards with less restrictive setback requirements.
- The use of an extended or new straight-run stair can have a substantial visual effect on the historic building's façade. Because a straight run stair is less compact in plan than a L- or U-Plan stair, a straight run stair has the potential to alter the overall massing of the building and the existing façade composition.

Side/Linear Stair

The Side/linear stair configuration is a simple variation of a straight run stair. Generally suited to lots which offer limited space and restrictive setbacks, this configuration includes a single flight of steps that adjoins and parallels the width of the porch or building façade wall. Because of its linear orientation, this stair type requires a landing. For high elevation examples, the stair run may be broken by an intermediate landing, which is sometimes called a rest.

Side/Linear Stair Advantages

- As with a straight-run stair, the side/linear stair may be less expensive to build than other types of stairs such as an L- or U-Plan stair.
- Its compact design may have less visual impact on the façade composition.
- It is well suited to lots with shallow setbacks and limited front yard depths.

Side/Linear Stair Disadvantages

- As an attached assemblage, a side/linear stair typically is not covered and therefore remains exposed to weather.
- A single run of steps may prove to be an inconvenience for separate tenants who would be sharing a single stair. For a duplex or a multi-family dwelling, a split stair may be a more appropriate design.

- A disproportionately wide side/linear stair may be visually out of scale with the porch or main body of the house and thus is generally a relatively narrow stair, not exceeding 3 or 4 feet in width.

Center/Linear Split Stair

Because it incorporates a symmetrical form, the center/linear split stair exhibits a formal architectural appearance, typically associated with high-style examples of architecture. In its simplest form, this type of stair is comprised of two primary components, a lower-level linear split form and a single upper-level run of stairs, which almost always lead to the main entry door. Because of its formal appearance and relatively compact plan, this stair type is best suited to residences where front yard space and setbacks are limited. A variety of architectural wall treatments, including brick and stone facing, copings, spheres, and sometimes urns resonate with the architectural themes present on the main body of the house and its front porch.

Center/Linear Split Stair Advantages

- In comparison to the straight-run stair, this form invites greater use of architectural stair walls, providing visual richness to the façade.
- It is well suited to lots with shallow-depth front yard and setback limitations.
- Stair walls offer opportunities to integrate planting beds and landscaping elements.

Center/Linear Split Stair Disadvantages

- It is not well suited to rural, vernacular or asymmetrical examples of architecture.
- In comparison to a straight-run stair, this form is more expensive to design and build.
- It is generally relatively narrow, not exceeding 3 or 4 feet in width, due to intermediate landing and turns.
- It has little applicability to low-level elevations.

Interior Stair

Interior stairs are located under the protective cover of a gallery or deep porch because of the need for shade, as well as shelter from the frequent and unpredictable downpours. Generally, the interior stair is a straight-run in configuration or may have a single landing or turn in some high elevation examples. Because the interior stair is tucked away, and sometimes almost hidden, beneath the gallery, the stair, railings, and newel are often of simple, straightforward design. In some cases, the interior stair serves as a secondary stair to a more formal and elaborate stair adorning a façade.

Interior Stair Advantages

- Because of its simplicity, an interior straight run staircase may be less expensive to build than other types of staircases.
- Because the stair is located beneath a gallery, it allows for a relatively uninterrupted façade composition.

- For a building undergoing an elevation, it is easy to add an interior stair (or more than one) at multiple locations.
- The interior stair is contained within the building footprint, and thus does not require an encroachment into the yard or setback.

Interior Stair Disadvantages

- An interior stair requires a deep porch or gallery (no less than eight feet in depth).
- This form is well suited to monumental architectural building types which incorporate a gallery.
- The interior stair may not be well adapted to a wider range of building types.
- An interior stair may interrupt circulation, column, windows and doors on the ground level and should be positioned with care.

For Tybee, are fence guidelines needed in this section?

4. FOUNDATION DESIGN GUIDELINES

Foundation Design

Buildings have been erected on Tybee Island for nearly a century in ways which attempt to minimize damage from flooding. The Tybee Raised Cottage demonstrates traditional methods used to treat architectural foundations and raise the living area above the flood zone. Many of the same foundation design treatments can be used in today's elevation design plans.

Because of the unique challenges involved in designing an appropriate foundation system for an elevated building, this topic is presented separately from the architecturally-related factors that must be evaluated in developing an elevation design plan. Much of the information presented in this section relates to specific engineering factors a property owner must consider in designing a foundation system. These factors include the applicable FEMA flood zone and the Advisory Base Flood Elevation (ABFE) [or effective Base Flood Elevation (BFE) if no ABFE is available] for the location of the historic building. Foundation systems must be designed by professional engineers familiar with relevant safety considerations.

The following discussion provides an overview of recommended foundation designs for the elevation of residential buildings on Tybee Island. This information will assist a historic property owner in choosing a foundation design that reduces flood risk and preserves the visual and architectural integrity of the property.

The two major types of residential foundations include open and closed foundations.

- Closed foundations are distinguished by perimeter walls of masonry construction that enclose the footprint of a residence. These foundations may also include concrete slab-on-grade construction. Generally, closed foundations are limited to an elevation lower than 8 feet above adjoining grade. Historic homes located within the immediate vicinity of the Atlantic Ocean may not be suited for closed foundation design, considering the local flood hazards, wave action, water pressure, and wind hazards.

- Open foundations are characterized by raised piers or piles with open area under the elevated structure. In some cases, open foundations may be fitted with non-structural, porous, architectural screening panels through which rising water levels can flow with minimal restriction.

The selection of an open or closed foundation depends upon the proposed height of a foundation above grade and the potential storm-related hazards within the flood zone. Open foundations are generally most appropriate where the foundation height is greater than 8 feet above grade and for sites that are located in a flood zone where the highest potential flood-related forces, especially those pertaining to high wind and water levels associated with storm surges, can be anticipated. Waterfront locations within the designated velocity zone, or "Zone V," require open foundations.

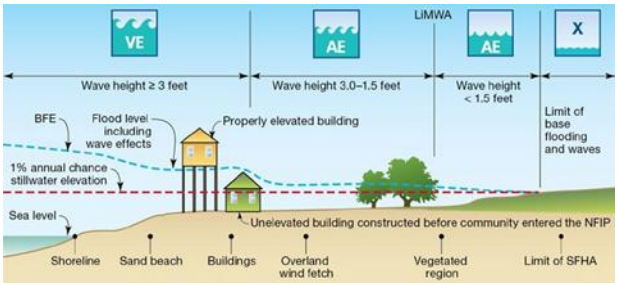
Residential Foundation Types

Closed Foundation

- Foundations up to 8 feet above grade
- Generally suited for inland areas
- Reinforced – crawl space
- Reinforced masonry – stem wall

Open Foundation

- Foundations up to 15 feet above grade
- Generally suited for coastal areas
- Timber pile
- Steel pipe pile, concrete column, grade beam
- Timber pile, concrete column, grade beam
- Concrete column, grade beam
- Concrete column, grade beam, slab



Typical Shoreline Perpendicular Transect Showing Stillwater and Wave Crest Elevations and Associated Flood Zones. (Adapted after Figure 3-53, FEMA, Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas (Fourth Edition) FEMA P-55, Volume I, August 2011.)

Wind Hazards Associated with Elevation

The higher a building is elevated, the greater the chances of future structural damage associated with wind and/or airborne debris. There are a number of methods of retrofitting a building to better protect and harden its envelope from such concerns, with a series of Individual Mitigation Measures (IMMs). IMMs can include such retrofits as roof clips to further secure the roof to the exterior walls, the installation of storm shutters, and bolting the exterior walls/sills to the elevated foundation system.

Other IMMs are intended to further protect associated household systems, such as the elevation (and associated tie-down) of HVAC, and strapping exterior propane or heating fuel tanks to their slab. The intention is for this combination of IMMs to work together to better protect an elevated property from future storm loss.

Relationship of Foundation Design to Architectural Design and Historic Preservation

The foundation design and elevation height should be selected to preserve the physical integrity of the historic building. Property owners should consider working with a design professional or elevation contractor, in concert with a professional engineer, to choose the appropriate foundation and treatment. The HPC and building permit staff can provide guidance on complying with design guidelines and building codes.

Successful elevation designs preserve the visual and architecturally significant features of an historic property while minimizing the flood risk. Preparing elevation design proposals for historic residential structures requires careful analysis of architectural elements and the context of the property. Some properties may require a minimal change in elevation with little impact on the historic integrity of the property or surrounding neighborhood. In other situations, there may be a dramatic difference between the existing elevation and the maximum ABFE (or effective BFE if an ABFE is not available) height requirement.

Elevation Considerations

- Consider the location of the historic property, determine the flood zone of the site, and identify local building code requirements.
- Review local flood mapping sources and then determine the ABFE (or effective BFE if an ABFE is not available) for the property. The height for the first floor elevation of the building is based on the ABFE for the flood zone for the property.
- Compare the existing first floor elevation of the residence to the ABFE (or effective BFE if an ABFE is not available).

Architectural Considerations

- Review building massing, architectural style, and façade design.
- Review distinguishing features of the property, including its site.
- Evaluate and assess the potential visual impacts on adjoining properties.
- Identify architectural and landscape screening alternatives.

Taking these considerations into account, choose a foundation design that will minimize the flood risk but preserve your property's historic features.

The placement of potential piers, columns, and other foundation elements must reflect an understanding of the architectural elements of the historic structure. Placement of the foundation components should complement existing locations of façade features such as columns, colonnades, corners, trim elements, and other vertical features. The existing elements provide visual references that can be repeated and extended throughout the new foundation design.

Permit Requirements

All elevation design plans and related foundation designs must be reviewed and approved by the local building permit office and the HPC. The historic property owner must submit elevation and foundation design plans prepared by a qualified professional designer. Successful elevation design plans demonstrate a thorough understanding of architectural, engineering, historic preservation, and flood hazard mitigation concerns. Once a project has received approval by the local building permit office and HPC, the elevation of the building may commence.

5. Elevation Construction

Basic Steps in House Elevation

Though many methods vary based on materials, wall construction type, and foundation type, the following sections describe the basic steps in elevating a house following the owner or building contractor's receipt of a building permit.

Disconnect Services and Break Connections

Prior to elevating the house, all utility lines (water, sewer, gas, electric, telephone services, etc.) need to be disconnected. The house-raising firm will then "break" all cement, stucco, and structural connections between the house and the foundation so that the house is free to lift off the foundation. Additionally, all wiring and pipes that could be crushed during the lifting process need to be separated or removed.

Excavate Foundation

Perimeter foundation excavation is required prior to inserting the heavy steel framework that will be used to support the house during lifting.

Insert Steel

Steel beams are next inserted beneath the foundation and lined up perpendicular to the floor joists. For slab-on-grade construction, a trench is dug immediately underneath the concrete slab; the steel beam is then placed against the underside of the concrete slab.

Insert Hydraulic Jacks

After the steel beams have been set, hydraulic jacks or lifts are placed at multiple points beneath the system of beams to minimize the possibility of damaging the house via twisting or differential movement. Before the invention of hydraulic jacks, various forms of manual jacks were used. As each required a human to concurrently physically manipulate the jack, these manual systems inevitably required more manpower, were less efficient, and were significantly more dangerous for the person manning the jack under the buildings being elevated.

Raise House

Once the steel beam and jacks are set in place, the operator deploys multiple hydraulic jacks to raise the house. Each jack stands atop a box cribbing tower of typically 6-inch x 6-inch timbers stacked so as to spread the load below. Because jacks are slowly raising the house only inches at a time, the jacking process can take several days, with one house raiser operating the jacks from a central control panel, while others monitor the jack points to ensure that the house is level. The operator can raise one jack at a time when needed or all jacks simultaneously. Mechanical screw jacks can also be used to assist, typically at small wings and additions. When all jacks are raised the same amount at the same time, the house will remain level as it rises and the risk of cracking due to stress is lessened. As the house continues to be raised incrementally, wooden cribbing is placed under the I-beams, typically at 12-inch stages.

Construct New Foundation

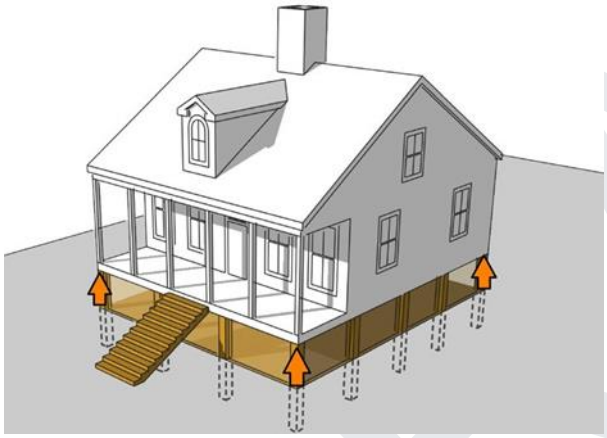
After lifting the house, the crew typically demolishes the old foundation and constructs a new one that meets State and local building codes and other applicable regulations. The type of new foundation system selected is contingent upon multiple factors, such as cost, ease of construction, soil type and stability, and the aesthetic effect desired, particularly for historic buildings.

Common Elevation Techniques

[Add berm elevation technique?]

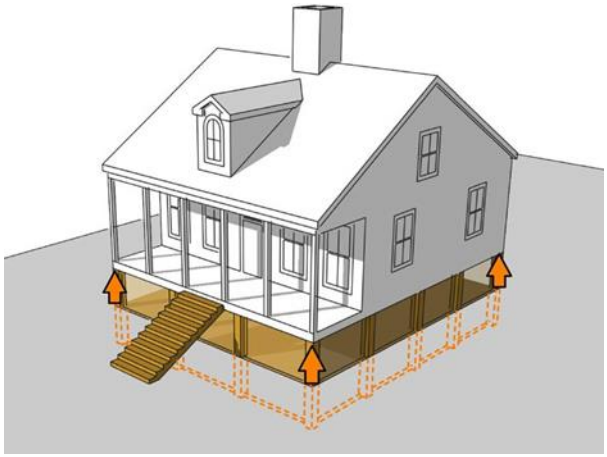
There are a number of common elevation techniques. The choice of technique depends on a number of factors, including the potential for flooding, regulatory requirements, the desires of the homeowner, and the type of pre-existing foundation.

Technique 1: Elevating by Extending Existing Piers or Walls



One of the most common elevation techniques is to extend the existing foundation to the desired new height. After the building is detached from its foundation and jacked up, the existing foundation is often saved and its walls are extended. The new portions of the walls are usually made of masonry block or cast-in-place concrete. Although in many cases this method is the easiest way to elevate a building, it may involve additional construction modifications or reinforcements. Depending on the size of the house, the amount of elevation, and the magnitude of the structural loads, the footings and foundation walls may need to be modified to ensure the structural stability of the home. Some or all of the original footings also may have to be replaced with larger footings. It may further be necessary to reinforce both the footings and the foundation walls with steel.

Technique 2: Whole House Elevation (Non-Slab)

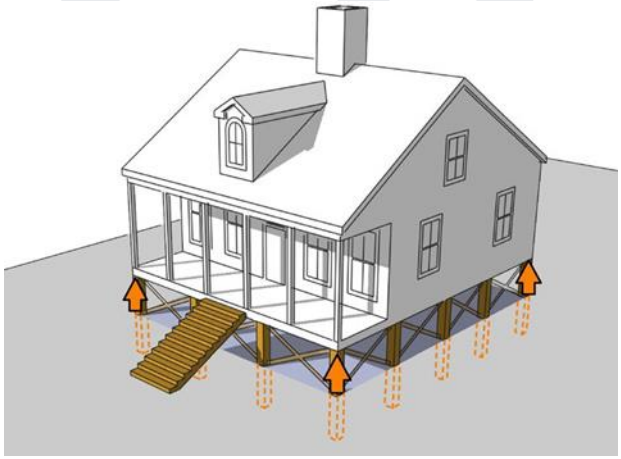


This technique involves raising the entire house, with floor attached, and building new piers or a foundation wall. First, steel beams are placed under the floor framing. Next, the house is raised in small increments with hydraulic jacks. Cribbing is placed beneath the steel beams to provide a support for the hydraulic jacks and a safety backup to prevent collapse of the house. This process is repeated until the desired height is reached.

When the required elevation is reached, the original foundation piers are removed and a trench is dug around the perimeter of the house and at other locations where a foundation system of piers will be required. Next, concrete is placed atop steel reinforcing or rebar that is laid in the trenches of the foundation system, which creates a steel-reinforced chain wall.

Finally, new piers are built below the raised house. Foundation walls can be constructed below the living space, with vents/openings to accommodate the potential for future flooding. This technique is generally considered the most cost-effective for houses that are already partially raised or restored.

Technique 3: Elevating on an Open Foundation – Piers, Posts or Columns, and Pilings

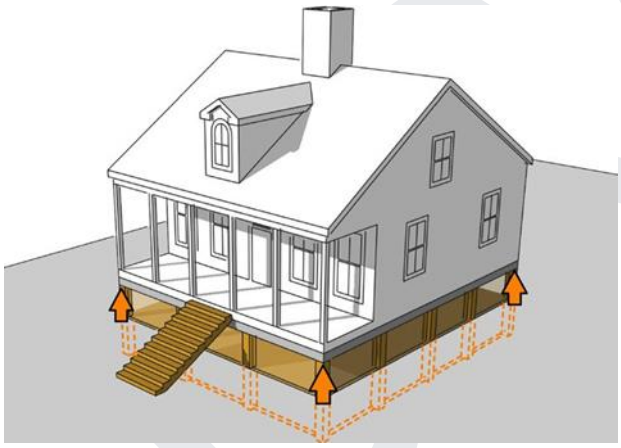


Frame, masonry veneer, and masonry houses on basement, crawlspace, and slab-on-grade foundations can also be elevated on open foundations consisting of piers, posts, columns, or pilings. Houses originally constructed on open foundations can also be elevated in this manner. Prior to the elevation process, a house on piers is separated from its existing foundations. Once the house has been raised to the desired height, new masonry piers are built on the existing foundation, if it is adequate. Because of the dynamic forces associated with flooding and wind, the piers typically are reinforced with steel.

For houses to be elevated on posts or columns, the uprights are usually set into drilled or excavated holes. Each post or column is either encased in concrete or anchored to a concrete pad. The house elevation process is identical to that described for piers, but the existing foundation must be removed so that the posts or columns and their concrete encasements or pads can be installed.

Elevating a building on pilings requires a more involved process. Pilings are usually driven into the ground or jetted into place with a high-pressure stream of water. They are not supported by concrete footings or pads. Unlike the construction of wall, pier, or post or column foundations, the pile-driving operation, which requires bulky heavy construction machinery, cannot be carried out under a house that has been lifted on jacks. Instead, the house is usually lifted and moved aside until the pilings have been installed. Because the existing foundation is not used, it must be removed.

Technique 4: Slab Elevation



Slab elevation entails raising the entire house with the slab floor attached and placing it on a new foundation higher off the ground. First, trenches are dug immediately below the concrete slab. Then, tunnels are excavated under the slab to allow the insertion of steel beams. Steel beams are lowered into the trenches and moved into place beneath the slab through the tunnels. The contractor must also dig holes for the lifting jacks because they have to be placed below the beams. Once the beams and jacks are in place, the lifting process begins. If pilings are present beneath the slab, they will be detached from the slab.

Next, the house is raised in small increments with hydraulic jacks. Cribbing is placed beneath the steel beams to provide support for the hydraulic jacks and a safety backup to prevent a collapse of the house. This process is repeated until the desired elevation height is reached. Next, rebar is laid in trenches around the house perimeter and other necessary areas. Concrete then is placed, creating a continuous, steel-reinforced chain wall. Finally, a new foundation wall is built below the raised slab, with vents and openings to accommodate potential future flooding.

Slab elevation generally is considered the most cost-effective solution for houses that have already undergone interior renovation. House raising companies must be very experienced before attempting a slab elevation because the concrete slab comprises most of the house's weight.

Technique 5: Slab Separation

Because of the prevalence of ranch houses, this technique lifts the house by detaching the entire structure from the slab foundation. Exterior siding must be removed, but may in some cases be reinstalled. The house is braced, and beams are placed through it to support it as it is raised. This results in the need to repair interior walls after the elevation.

Because the slab is not lifted, I-beams are inserted through openings cut into the walls of the house above the slab rather than below it. To enable the beams to lift the house, the contractor attaches horizontal wood bracing to the interior and exterior walls at the tops of the openings. When the beams are jacked up, they push against the bracing, which distributes the lifting force equally across the walls. The bracing also supports the walls, which lack the structural stability that would otherwise be provided when the walls and floor are left attached. Without bracing, the walls could twist, bend, or collapse during lifting.

Once braced, the house is raised in small increments with hydraulic jacks. Wooden cribbing is placed beneath the steel beams to provide a support for the hydraulic jacks and to serve as a safety backup to prevent collapse. This process is repeated until the desired elevation height is reached. Piers are

constructed for support on top of the existing slab and foundation walls, which provide additional support, and can be constructed with vent openings to allow water to pass through in the case of flooding. An engineer must inspect the slab beforehand to ensure that it is capable of supporting the point load of the weight of the house on the new piers; elevation firms will look at the dimensions, condition, and materials of the extant slab, as well as the surrounding soils (and any subsidence), to determine if this option of elevation is feasible. The primary advantage of elevating the house without the slab is that the house is lighter and, therefore, easier to lift.

Technique 6: Wall Extension

Known as wall extension, this technique involves extending the existing walls of the house upward and raises the lowest floor. With this method, the roof is removed and the structural framing members supporting it are extended upward less than one story. New bricks or other siding material are then added to complete the exterior renovation. As a result of this elevation technique, the lowest floor is raised above its original height. Now set at a level above the flood elevation, vents and openings are installed beneath the first floor to accommodate the possibility of future flooding.

6. RESOURCES

[ADD State and Local References]

National Reference Information and Publications

Secretary of the Interior's Standards for Rehabilitation

The *Secretary of the Interior's Standards for Rehabilitation* (Department of the Interior Regulations, Title 36 Code of Federal Regulations [CFR] Part 67) are used by Federal agencies in carrying out their historic preservation responsibilities for properties in Federal ownership or control, and State and local officials in reviewing both Federal and non-Federal rehabilitation projects. They have also been adopted by numerous local HPCs for use in evaluating renovation and new construction within locally designated historic districts.

The intent of the *Standards for Rehabilitation* is to assist in the long-term preservation of a property's significance through the retention of historic materials and features. The *Standards for Rehabilitation* pertain to historic buildings of many construction types, materials, sizes, and occupancies. They also address related landscape features and the building's site and environment, as well as attached, adjacent, or related new construction.

"Rehabilitation" of an historic building involves at least some repair to allow efficient contemporary use; however, these repairs and alterations must not damage or destroy materials, features, or finishes that are important in defining the building's historic character. For example, certain treatments, if

improperly applied, may cause or accelerate physical deterioration of the historic building. This can include using improper repointing or exterior masonry cleaning techniques, or introducing insulation that damages the historic fabric. In most of these situations, use of these materials and treatments will result in a project that does not meet the *Standards for Rehabilitation*. Similarly, exterior additions that slavishly replicate the form, material, and detailing of the building to the extent that they compromise the historic character of the building will also fail to meet the *Standards for Rehabilitation*.

When working with a design professional to design an elevation project that will be successfully approved by the HPC and the Georgia Historic Preservation Division, the *Standards for Rehabilitation* should be carefully integrated into the proposed design. They are to be applied to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility. The *Standards for Rehabilitation* are as follows:

Standard 1. A property will be used as it was historically or given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.

Standard 2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features and special relationships that characterize a property will be avoided.

Standard 3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

Standard 4. Changes to a property that have acquired significance in their own right will be retained and preserved.

Standard 5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

Standard 6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary and physical evidence.

Standard 7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

Standard 8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Standard 9. New additions, exterior alterations, or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the historic integrity of the property and its environment.

Standard 10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

To review the *Standards for Rehabilitation* and their associated guidelines (including *Guidelines on Flood Adaptation for Rehabilitating Historic Buildings*), along with more detailed visual information on the treatment of historic building materials using the *Standards for Rehabilitation*, please visit https://www.nps.gov/tps/standards.htm

Federal Emergency Management Agency Publications

The Federal Emergency Management Agency (FEMA) makes available numerous publications of interest to the public and professional engineers, floodplain managers, building officials, and local historic preservation commissions. In particular, the following publications may be of use to owners of historic buildings who wish to learn more about the design of foundation systems in high- hazard coastal areas.

VERIFY/UPDATE REFERENCES FOR FEMA PUBLICATIONS

FEMA 15. Design Guidelines for Flood Damage Reduction (December 1981).

FEMA 54. Elevated Residential Structures (March 1984).

FEMA 55. Coastal Construction Manual, Third Edition (June 2000) (foundations, but not pilings) 3-volume set

FEMA 102. Floodproofing Non-Residential Structures (May 1986).

FEMA 114. Design Manual for Retrofitting Floodprone Residential Structures (December 1986). Presents floodproofing techniques that can be used for existing residential structures.

FEMA 259. Engineering Principles and Practices for Retrofitting Floodprone Residential Buildings (January 1995). Provides engineering design and economic guidance to engineers, architects, and local code officials about what constitutes technically feasible and cost-effective retrofitting measures for floodprone residential structures.

FEMA 265. Managing Floodplain Development in Approximate Zone A Areas, A Guide for Obtaining and Developing Base (100-Year) Flood Elevations with Quick-2, Version 1.0, Computation of Water Surface Elevations (July 1995).

FEMA 311. Guidance on Estimating Substantial Damage. Using the National Flood Insurance Program (NFIP) Residential Substantial Damage Estimator, Guidance: Software and Manual Computation Worksheet, Software Version 1.1 (December 1998).

FEMA 346VT (Video Tape). Above the Flood: Elevating Your Floodprone House (June 2000). Narrated version of FEMA 347 including animations, live footage, and interviews

FEMA 347. Above the Flood: Elevating Your Floodprone House (May 2000).

FEMA 348. Protecting Building Utilities from Flood Damage (November 1999).

FEMA 386-1. Getting Started, Building Support for Mitigation Planning, State and Local Mitigation How-To Guide (September 2002)

FEMA 386-6. Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning, State and Local Mitigation How-To Guide (May 2005).

FEMA 480. National Flood Insurance Program Floodplain Management Requirements, A Study Guide and Desk Reference for Local Officials (February 2005).

FEMA 496. Joining the National Flood Insurance Program (May 2005).

FEMA 499. Home Builder's Guide to Coastal Construction Technical Fact Sheet Series (August 2005). Contains recommendations for residential buildings subject to flood and wind forces in coastal environments. Addresses siting of coastal buildings and recommended building design and construction practices including structural connections, the building envelope, and utilities.

Fact Sheet No. 1. Coastal Building Successes and Failures.

Fact Sheet No. 2. Summary of Coastal Construction Requirements and Recommendations

Fact Sheet No. 3. Using a Flood Insurance Rate Map (FIRM)

Fact Sheet No. 4. Lowest Floor Elevation

Fact Sheet No. 5. V Zone Design and Construction Certification

Fact Sheet No. 6. How Do Siting and Design Decisions Affect the Owner's Costs?

Fact Sheet No. 7. Selecting a Lot and Siting the Building

Fact Sheet No. 8. Coastal Building Materials

Fact Sheet No. 9. Moisture Barrier Systems

Fact Sheet No. 10. Load Paths

Fact Sheet No. 11. Foundations in Coastal Areas

Fact Sheet No. 12. Pile Installation

Fact Sheet No. 13. Wood-Pile-to-Beam Connections

Fact Sheet No. 14. Reinforced Masonry Pier Construction

Fact Sheet No. 15. Foundation Walls

Fact Sheet No. 16. Masonry Details

Fact Sheet No. 17. Use of Connectors and Brackets

Fact Sheet No. 18. Roof Sheathing Installation

Fact Sheet No. 19. Roof Underlayment for Asphalt Shingle Roofs

Fact Sheet No. 20. Asphalt Shingle Roofing for High- Wind Areas

Fact Sheet No. 21. Tile Roofing for High-Wind Areas

Fact Sheet No. 22. Window and Door Insulation

Fact Sheet No. 23. Housewrap

Fact Sheet No. 24. Roof-to-Wall and Deck-to-Wall Flashing

Fact Sheet No. 25. Siding Installation and Connectors

Fact Sheet No. 26. Shutter Alternatives

Fact Sheet No. 27. Enclosures and Breakaway Walls

Fact Sheet No. 28. Decks, Pools, and Accessory Structures

Fact Sheet No. 29. Protecting Utilities

Fact Sheet No. 30. Repairs, Remodeling, Additions, and Retrofitting

Fact Sheet No. 31. References

FEMA. Answers to Questions About the National Flood Insurance Program, May 2006.

FEMA. Reducing Flood Losses Through the International Codes, Meeting the Requirements of the National Flood Insurance Program, 2nd Edition, 2005.

Title 44. Code of Federal Regulations, Parts 59-78, National Flood Insurance (NFIP) Regulations (Revised October 2002)

Individuals may view electronic copies of these documents by visiting the FEMA Library, an electronic collection of research and publication materials maintained by the agency. To search for files in the library, please visit www.fema.gov/library.

In addition, many of these publications are available, free of charge, by requesting them from FEMA's Publications Warehouse. Have the publication reference number available and contact the warehouse at:
Telephone: 1-800-480-2520
(8:00 a.m. – 5:00 p.m. Eastern Time)
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