



**PDHonline Course A107 (5 PDH)**

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# **Restoration Standards and Guidelines for Historic Buildings**

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**PDH Online | PDH Center**

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# Standards for Restoration & Guidelines for Restoring Historic Buildings

*Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.*



## Standards for Restoration

1. A property will be used as it was historically or be given a new use which reflects the property's restoration period.
2. Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will not be undertaken.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Materials, features, spaces, and finishes that characterize other historical periods will be documented prior to their alteration or removal.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize the restoration period will be preserved.
6. Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials.
7. Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.
8. 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.
9. Archeological resources affected by a project will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
10. Designs that were never executed historically will not be constructed.

## Guidelines for Restoring Historic Buildings

### Introduction

Rather than maintaining and preserving a building as it has evolved over time, the expressed goal of the **Standards for Restoration and Guidelines for Restoring Historic Buildings** is to make the building appear as it did at a particular—and most significant—time in its history. First, those materials and features from the “restoration period” are identified, based on thorough historical research. Next, features from the restoration period are maintained, protected, repaired (i.e., stabilized, consolidated, and conserved), and replaced, if necessary. As opposed to other treatments, the scope of work in **Restoration** can include removal of features from other periods; missing features from the restoration period may be replaced, based on documentary and physical evidence, using traditional materials or compatible substitute materials. The final guidance emphasizes that only those designs that can be documented as having been built should be re-created in a restoration project.

### Identify, Retain, and Preserve Materials and Features from the Restoration Period

The guidance for the treatment **Restoration** begins with recommendations to identify the form and detailing of those existing architectural materials and features that are significant to the restoration period as established by historical research and documentation. Thus, guidance on *identifying, retaining, and preserving* features from the restoration period is always given first. The historic building’s appearance may be defined by the form and detailing of its exterior materials, such as masonry, wood, and metal; exterior features, such as roofs, porches, and windows;

interior materials, such as plaster and paint; and interior features, such as moldings and stairways, room configuration and spatial relationships, as well as structural and mechanical systems; and the building’s site and setting.

### Protect and Maintain Materials and Features from the Restoration Period

After identifying those existing materials and features from the restoration period that must be retained in the process of **Restoration** work, then *protecting and maintaining* them is addressed. Protection generally involves the least degree of intervention and is preparatory to other work. For example, protection includes the maintenance of historic material through treatments such as rust removal, caulking, limited paint removal, and re-application of protective coatings; the cyclical cleaning of roof gutter systems; or installation of fencing, alarm systems and other temporary protective measures. Although a historic building will usually require more extensive work, an overall evaluation of its physical condition should always begin at this level.

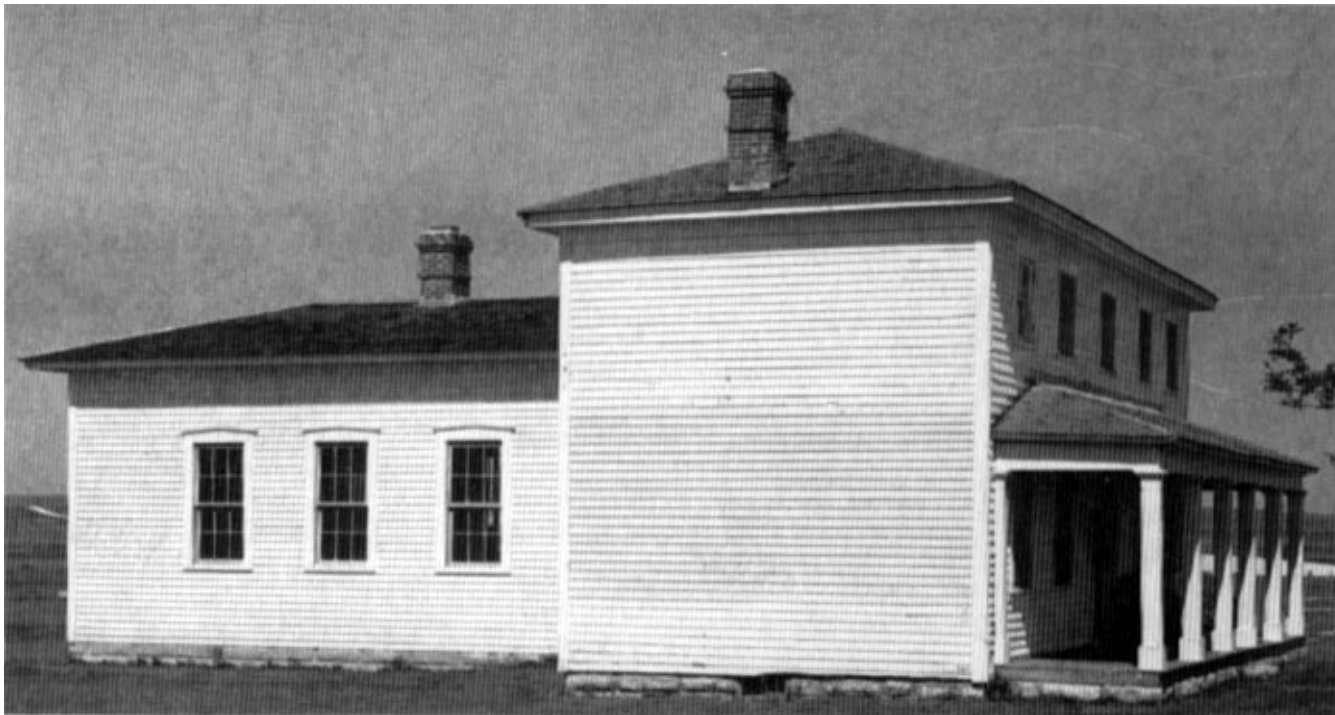
### Repair (Stabilize, Consolidate, and Conserve) Materials and Features from the Restoration Period

Next, when the physical condition of restoration period features requires additional work, *repairing* by *stabilizing, consolidating, and conserving* is recommended. **Restoration** guidance focuses upon the preservation of those materials and features that are significant to the period. Consequently, guidance for repairing a historic material, such as masonry, again begins with the least degree of intervention possible, such as strengthening fragile materials through consolidation, when appropriate, and repointing with mortar of an appropriate strength. Repairing masonry as well as wood and architectural metals includes

patching, splicing, or otherwise reinforcing them using recognized preservation methods. Similarly, portions of a historic structural system could be reinforced using contemporary material such as steel rods. In **Restoration**, repair may also include the limited replacement in kind—or with compatible substitute material—of extensively deteriorated or missing parts of existing features when there are surviving prototypes to use as a model. Examples could include terra-cotta brackets, wood balusters, or cast iron fencing.

### **Replace Extensively Deteriorated Features from the Restoration Period**

In **Restoration**, *replacing* an entire feature from the restoration period (i.e., a cornice, balustrade, column, or stairway) that is too deteriorated to repair may be appropriate. Together with documentary evidence, the form and detailing of the historic feature should be used as a model for the replacement. Using the same kind of material is preferred; however, compatible substitute material may be considered. All new work should be unobtrusively dated to guide future research and treatment.



*In a project at Fort Hays, Kansas, the wood frame officers' quarters were restored to the late 1860s—their period of significance. This included replacing a missing kitchen ell, chimneys, porch columns, and cornice, and closing a later window opening in the main block. The building and others in the museum complex is used to interpret frontier history.*

If documentary and physical evidence are not available to provide an accurate re-creation of missing features, the treatment Rehabilitation might be a better overall approach to project work.

### **Remove Existing Features from Other Historic Periods**

Most buildings represent continuing occupancies and change over time, but in **Restoration**, the goal is to depict the building as it appeared at the most significant time in its history. Thus, work is included to remove or alter existing historic features that do not represent the restoration period. This could include features such as windows, entrances and doors, roof dormers, or landscape features. Prior to altering or removing materials, features, spaces, and finishes that characterize other historical periods, they should be documented to guide future research and treatment.

### **Re-Create Missing Features from the Restoration Period**

Most **Restoration** projects involve re-creating features that were significant to the building at a particular time, but are now missing. Examples could include a stone balustrade, a porch, or cast iron storefront. Each missing feature should be substantiated by documentary and physical evidence. Without sufficient documentation for these “re-creations,” an accurate depiction cannot be achieved. Combining features that never existed together historically can also create a false sense of history. Using traditional materials to depict lost features is always the preferred approach; however, using compatible substitute material is an acceptable alternative in **Restoration** because, as emphasized, the goal of this treatment is to replicate the “appearance” of the historic building at a particular time, not to retain and preserve all historic materials as they have evolved over time.

If documentary and physical evidence are not available to provide an accurate re-creation of missing features, the treatment Rehabilitation might be a better overall approach to project work.

### **Energy Efficiency/Accessibility Considerations/Health and Safety Code Considerations**

These sections of the **Restoration** guidance address work done to meet accessibility requirements and health and safety code requirements; or limited retrofitting measures to improve energy efficiency. Although this work is quite often an important aspect of restoration projects, it is usually not part of the overall process of protecting, stabilizing, conserving, or repairing features from the restoration period; rather, such work is assessed for its potential negative impact on the building’s historic appearance. For this reason, particular care must be taken not to obscure, damage, or destroy historic materials or features from the restoration period in the process of undertaking work to meet code and energy requirements.

*Restoration as a Treatment. When the property’s design, architectural, or historical significance during a particular period of time outweighs the potential loss of extant materials, features, spaces, and finishes that characterize other historical periods; when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned, Restoration may be considered as a treatment. Prior to undertaking work, a particular period of time, i.e., the restoration period, should be selected and justified, and a documentation plan for Restoration developed.*

## Building Exterior

### Masonry: Brick, stone, terra cotta, concrete, adobe, stucco and mortar

#### *Recommended*

*Identifying, retaining, and preserving* masonry features from the restoration period such as walls, brackets, railings, cornices, window architraves, door pediments, steps, and columns; and details such as tooling and bonding patterns, coatings, and color.

*Protecting and maintaining* masonry from the restoration period by providing proper drainage so that water does not stand on flat, horizontal surfaces or accumulate in curved decorative features.

Cleaning masonry only when necessary to halt deterioration or remove heavy soiling.

Carrying out masonry surface cleaning tests after it has been determined that such cleaning is appropriate. Tests should be observed over a sufficient period of time so that both the immediate and the long range effects are known to enable selection of the gentlest method possible.

#### *Not Recommended*

Altering masonry features from the restoration period.

Failing to properly document masonry features from the restoration period which may result in their loss.

Applying paint or other coatings such as stucco to masonry or removing paint or stucco from masonry if such treatments cannot be documented to the restoration period.

Changing the type or color of the paint or coating unless the work can be substantiated by historical documentation.

Failing to evaluate and treat the various causes of mortar joint deterioration such as leaking roofs or gutters, differential settlement of the building, capillary action, or extreme weather exposure.

Cleaning masonry surfaces when they are not heavily soiled, thus needlessly introducing chemicals or moisture into historic materials.

Cleaning masonry surfaces without testing or without sufficient time for the testing results to be of value.

*Recommended*

Cleaning masonry surfaces with the gentlest method possible, such as low pressure water and detergents, using natural bristle brushes.

Inspecting painted masonry surfaces to determine whether repainting is necessary.

Removing damaged or deteriorated paint only to the next sound layer using the gentlest method possible (e.g., hand-scraping) prior to repainting.

Applying compatible paint coating systems following proper surface preparation.

Repainting with colors that are documented to the restoration period of the building.

Evaluating the existing condition of the masonry to determine whether more than protection and maintenance are required, that is, if repairs to masonry features from the restoration period will be necessary.

*Repairing, stabilizing and conserving* fragile masonry from the restoration period by well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.

*Not Recommended*

Sandblasting brick or stone surfaces using dry or wet grit or other abrasives. These methods of cleaning permanently erode the surface of the material and accelerate deterioration.

Using a cleaning method that involves water or liquid chemical solutions when there is any possibility of freezing temperatures.

Cleaning with chemical products that will damage masonry, such as using acid on limestone or marble, or leaving chemicals on masonry surfaces.

Applying high pressure water cleaning methods that will damage historic masonry and the mortar joints.

Removing paint that is firmly adhering to, and thus protecting, masonry surfaces.

Using methods of removing paint which are destructive to masonry, such as sandblasting, application of caustic solutions, or high pressure waterblasting.

Failing to follow manufacturers' product and application instructions when repainting masonry.

Using new paint colors that are not documented to the restoration period of the building.

Failing to undertake adequate measures to assure the protection of masonry features from the restoration period.

Removing masonry from the restoration period that could be stabilized, repaired and conserved; or using untested consolidants and untrained personnel, thus causing further damage to fragile historic materials.



### *Recommended*

Repairing masonry walls and other masonry features by repointing the mortar joints where there is evidence of deterioration such as disintegrating mortar, cracks in mortar joints, loose bricks, damp walls, or damaged plasterwork.

Removing deteriorated mortar by carefully hand-raking the joints to avoid damaging the masonry.

Duplicating and, if necessary, reproducing period mortar in strength, composition, color, and texture.

Duplicating and, if necessary, reproducing period mortar joints in width and in joint profile.

Repairing stucco by removing the damaged material and patching with new stucco that duplicates stucco of the restoration period in strength, composition, color, and texture.

Using mud plaster as a surface coating over unfired, unstabilized adobe because the mud plaster will bond to the adobe.

Cutting damaged concrete back to remove the source of deterioration (often corrosion on metal reinforcement bars). The new patch must be applied carefully so it will bond satisfactorily with, and match, the historic concrete.

### *Not Recommended*

Removing nondeteriorated mortar from sound joints, then repointing the entire building to achieve a uniform appearance.

Using electric saws and hammers rather than hand tools to remove deteriorated mortar from joints prior to repointing.

Repointing with mortar of high portland cement content (unless it is the content of the historic mortar). This can often create a bond that is stronger than the historic material and can cause damage as a result of the differing coefficient of expansion and the differing porosity of the material and the mortar.

Repointing with a synthetic caulking compound.

Using a “scrub” coating technique to repoint instead of traditional repointing methods.

Changing the width or joint profile when repointing.

Removing sound stucco; or repairing with new stucco that is stronger than the historic material or does not convey the same visual appearance.

Applying cement stucco to unfired, unstabilized adobe. Because the cement stucco will not bond properly, moisture can become entrapped between materials, resulting in accelerated deterioration of the adobe.

Patching concrete without removing the source of deterioration.

*Recommended*

Repairing masonry features from the restoration period by patching, piecing-in, or otherwise reinforcing the masonry using recognized preservation methods. Repair may also include the limited replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts of masonry features from the restoration period when there are surviving prototypes such as terra-cotta brackets or stone balusters. The new work should be unobtrusively dated to guide future research and treatment.

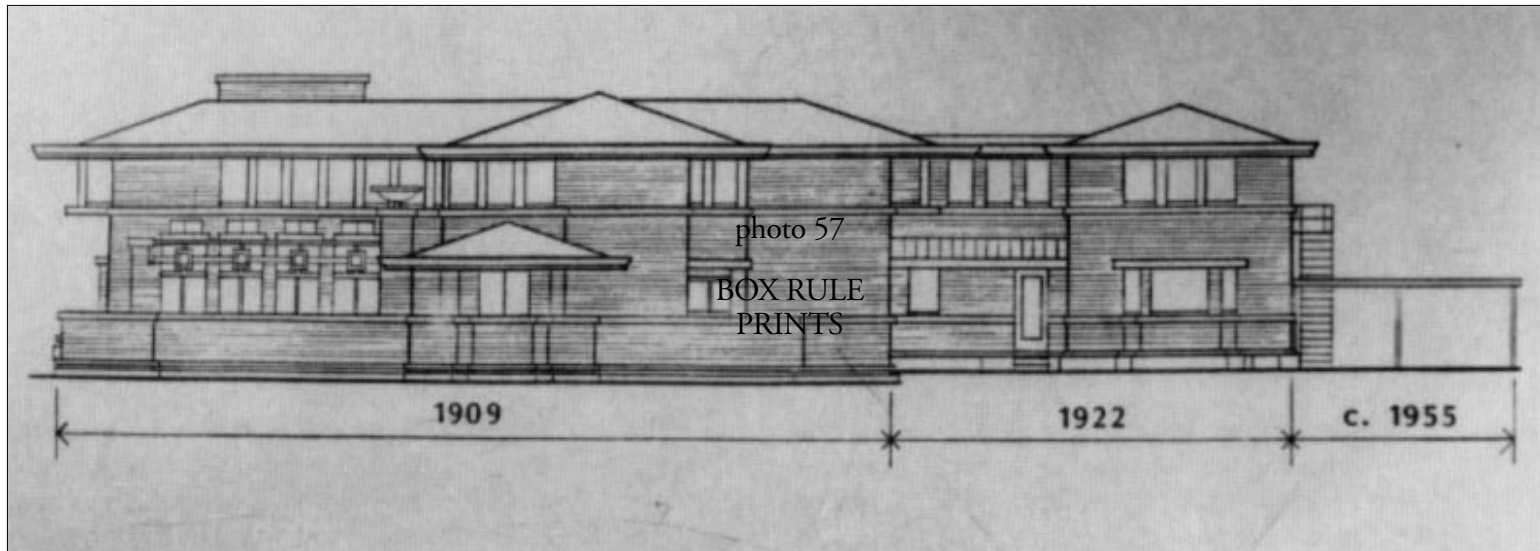
Applying new or non-historic surface treatments such as water-repellent coatings to masonry only after repointing and only if masonry repairs have failed to arrest water penetration problems.

*Not Recommended*

Replacing an entire masonry feature from the restoration period such as a cornice or balustrade when repair of the masonry and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the masonry feature or that is physically or chemically incompatible.

Applying waterproof, water repellent, or non-historic coatings such as stucco to masonry as a substitute for repointing and masonry repairs. Coatings are frequently unnecessary, expensive, and may change the appearance of historic masonry as well as accelerate its deterioration.



*The Meyer May House in Grand Rapids, Michigan, was designed by Frank Lloyd Wright and built in 1909. In 1922, May added to the house for an expanding family. After the May occupancy, the house was altered for use as apartments, with a carport added in 1955. In the 1980s restoration, the Wright's original design was deemed more significant than May's later changes, and, as a result, the additions were removed and the house returned to its 1909 appearance. Drawing: Martha L. Werenfels, AIA.*

### *Recommended*

**Replacing** in kind an entire masonry feature from the restoration period that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model to reproduce the feature. Examples can include large sections of a wall, a cornice, balustrade, column, or stairway. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic masonry features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing masonry features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering masonry features from other historic periods such as a later doorway, porch, or steps.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing masonry feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a terra-cotta bracket or stone balustrade.

### *Not Recommended*

Removing a masonry feature from the restoration period that is unrepairable and not replacing it.

### *Not Recommended*

Failing to remove a masonry feature from another period, thus confusing the depiction of the building's significance.

Failing to document masonry features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a masonry feature that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Exterior

### Wood: Clapboard, weatherboard, shingles, and other wooden siding and decorative elements

#### *Recommended*

*Identifying, retaining, and preserving* wood features from the restoration period such as siding, cornices, brackets, window architraves, and doorway pediments; and their paints, finishes, and color.

*Protecting and maintaining* wood features from the restoration period by providing proper drainage so that water is not allowed to stand on flat, horizontal surfaces or accumulate in decorative features.

Applying chemical preservatives to wood features such as beam ends or outriggers that are exposed to decay hazards and are traditionally unpainted.

Retaining coatings such as paint that help protect the wood from moisture and ultraviolet light. Paint removal should be considered only where there is paint surface deterioration and as part of an overall maintenance program which involves repainting or applying other appropriate protective coatings.

Inspecting painted wood surfaces to determine whether repainting is necessary or if cleaning is all that is required.

Removing damaged or deteriorated paint to the next sound layer using the gentlest method possible (handscraping and handsanding), then repainting.

#### *Not Recommended*

Altering wood features from the restoration period.

Failing to properly document wood features from the restoration period which may result in their loss.

Applying paint or other coatings to wood or removing paint from wood if such treatments cannot be documented to the restoration period.

Changing the type or color of the paint or coating unless the work can be substantiated by historical documentation.

Failing to identify, evaluate, and treat the causes of wood deterioration, including faulty flashing, leaking gutters, cracks and holes in siding, deteriorated caulking in joints and seams, plant material growing too close to wood surfaces, or insect or fungus infestation.

Using chemical preservatives such as creosote which, unless they were used historically, can change the appearance of wood features.

Stripping paint or other coatings to reveal bare wood, thus exposing historically coated surfaces to the effects of accelerated weathering.

Removing paint that is firmly adhering to, and thus, protecting wood surfaces.

Using destructive paint removal methods such as propane or butane torches, sandblasting or waterblasting. These methods can irreversibly damage historic woodwork.



*Ongoing work at this house focuses on the maintenance and repair of exterior wood features from the restoration period. After scraping and sanding, the wood was painted in colors documented to the Restoration period. Photo: ©Mary Randlett, 1992.*

### *Recommended*

Using with care electric hot-air guns on decorative wood features and electric heat plates on flat wood surfaces when paint is so deteriorated that total removal is necessary prior to repainting.

Using chemical strippers primarily to supplement other methods such as handscraping, handsanding and the above-recommended thermal devices. Detachable wooden elements such as shutters, doors, and columns may—with the proper safeguards—be chemically dip-stripped.

### *Not Recommended*

Using thermal devices improperly so that the historic woodwork is scorched.

Failing to neutralize the wood thoroughly after using chemicals so that new paint does not adhere.

Allowing detachable wood features to soak too long in a caustic solution so that the wood grain is raised and the surface roughened.

*Recommended*

Applying compatible paint coating systems following proper surface preparation.

Repainting with colors that are documented to the restoration period of the building.

Evaluating the existing condition of the wood to determine whether more than protection and maintenance are required, that is, if repairs to wood features from the restoration period will be necessary.

*Repairing, stabilizing, and conserving* fragile wood from the restoration period using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.

Repairing wood features from the restoration period by patching, piecing-in, or otherwise reinforcing the wood using recognized preservation methods. Repair may also include the limited replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts of features from the restoration period where there are surviving prototypes such as brackets, molding, or sections of siding. The new work should be unobtrusively dated to guide future research and treatment.

*Replacing* in kind an entire wood feature from the restoration period that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model to reproduce the feature. Examples of wood features include a cornice, entablature or balustrade. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*Not Recommended*

Failing to follow manufacturers' product and application instructions when repainting exterior woodwork.

Using new colors that are not documented to the restoration period of the building.

Failing to undertake adequate measures to assure the protection of wood features from the restoration period.

Removing wood from the restoration period that could be stabilized and conserved; or using untested consolidants and untrained personnel, thus causing further damage to fragile historic materials.

Replacing an entire wood feature from the restoration period such as a cornice or wall when repair of the wood and limited replacement of deteriorated or missing parts are appropriate.

Using substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the wood feature or that is physically or chemically incompatible.

Removing a wood feature from the restoration period that is unrepairable and not replacing it.

## Restoration

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic wood features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing wood features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering wood features from other historic periods such as a later doorway, porch, or steps.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing wood feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a roof dormer or porch.

### *Not Recommended*

Failing to remove a wood feature from another period, thus confusing the depiction of the building's significance.

Failing to document wood features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a wood feature that was part of the original design for the building, but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Exterior

### Architectural Metals: Cast iron, steel pressed tin, copper, aluminum, and zinc

#### *Recommended*

*Identifying, retaining, and preserving* architectural metal features from the restoration period such as columns, capitals, window hoods, or stairways; and their finishes and colors. Identification is also critical to differentiate between metals prior to work. Each metal has unique properties and thus requires different treatments.

*Protecting and maintaining* restoration period architectural metals from corrosion by providing proper drainage so that water does not stand on flat, horizontal surfaces or accumulate in curved, decorative features.

Cleaning architectural metals, when appropriate, to remove corrosion prior to repainting or applying other appropriate protective coatings.

Identifying the particular type of metal prior to any cleaning procedure and then testing to assure that the gentlest cleaning method possible is selected or determining that cleaning is inappropriate for the particular metal.

Cleaning soft metals such as lead, tin, copper, terneplate, and zinc with appropriate chemical methods because their finishes can be easily abraded by blasting methods.

#### *Not Recommended*

Altering architectural metal features from the restoration period.

Failing to properly document architectural metal features from the restoration period which may result in their loss.

Changing the type of finish, historic color, or accent scheme unless the work can be substantiated by historical documentation.

Failing to identify, evaluate, and treat the causes of corrosion, such as moisture from leaking roofs or gutters.

Exposing metals which were intended to be protected from the environment.

Applying paint or other coatings to metals such as copper, bronze, or stainless steel that were meant to be exposed.

Using cleaning methods which alter or damage the historic color, texture, and finish of the metal; or cleaning when it is inappropriate for the metal.

Removing the patina of historic metal. The patina may be a protective coating on some metals, such as bronze or copper, as well as a significant historic finish.

Cleaning soft metals such as lead, tin, copper, terneplate, and zinc with grit blasting which will abrade the surface of the metal.



### *Recommended*

Using the gentlest cleaning methods for cast iron, wrought iron, and steel—hard metals—in order to remove paint buildup and corrosion. If handscraping and wire brushing have proven ineffective, low pressure grit blasting may be used as long as it does not abrade or damage the surface.

Applying appropriate paint or other coating systems after cleaning in order to decrease the corrosion rate of metals or alloys.

Repainting with colors that are documented to the restoration period of the building.

Applying an appropriate protective coating such as lacquer to an architectural metal feature such as a bronze door which is subject to heavy pedestrian use.

Evaluating the existing condition of the architectural metals to determine whether more than protection and maintenance are required, that is, if repairs to metal features from the restoration period will be necessary.

*Repairing, stabilizing, and conserving* fragile architectural metal from the restoration period using well-tested consolidants, when appropriate. Repairs should be physically and visually compatible and identifiable upon close inspection for future research.

Repairing architectural metal features from the restoration period by patching, splicing, or otherwise reinforcing the metal using recognized preservation methods. Repairs may also include the limited replacement in kind—or with a compatible substitute material—of those extensively deteriorated or missing parts of features from the restoration period when there are surviving prototypes such as porch balusters, column capitals or bases; or porch cresting. The new work should be unobtrusively dated to guide future research and treatment.

### *Not Recommended*

Failing to employ gentler methods prior to abrasively cleaning cast iron, wrought iron or steel; or using high pressure grit blasting.

Failing to re-apply protective coating systems to metals or alloys that require them after cleaning so that accelerated corrosion occurs.

Using new colors that are not documented to the restoration period of the building.

Failing to assess pedestrian use or new access patterns so that architectural metal features are subject to damage by use or inappropriate maintenance such as salting adjacent sidewalks.

Failing to undertake adequate measures to assure the protection of architectural metal features from the restoration period.

Removing architectural metal from the restoration period that could be stabilized and conserved; or using untested consolidants and untrained personnel, thus causing further damage to fragile historic materials.

Replacing an entire architectural metal feature from the restoration period such as a column or a balustrade when repair of the metal and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the architectural metal feature or that is physically or chemically incompatible.



*The Standards for Restoration call for the repair of existing features from the restoration period as well as the re-creation of missing features from the period. In some instances, when missing features are replaced, substitute materials may be considered if they convey the appearance of the historic materials. In this example at Philadelphia's Independence Hall, the clock was re-built in 1972-73 using cast stone and wood with fiberglass and polyester bronze ornamentation. Photo: Lee H. Nelson, FAIA.*

### *Recommended*

**Replacing** in kind an entire architectural metal feature from the restoration period that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model to reproduce the feature. Examples could include cast iron porch steps or roof cresting. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

### *Not Recommended*

Removing an architectural metal feature from the restoration period that is unrepairable and not replacing it.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic architectural metal features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing architectural metal features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering architectural metal features from other historic periods such as a later cast iron porch railing or aluminum windows.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing architectural metal feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a cast iron storefront or porch.

### *Not Recommended*

Failing to remove an architectural metal feature from another period, thus confusing the depiction of the building's significance.

Failing to document architectural metal features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing an architectural metal feature that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Exterior

### Roofs

#### *Recommended*

Identifying, retaining, and preserving roofs and roof features from the restoration period. This includes the roof's shape, such as hipped, gambrel, and mansard; decorative features such as cupolas, cresting, chimneys, and weathervanes; and roofing material such as slate, wood, clay tile, and metal, as well as size, color, and patterning.

*Protecting and maintaining* a restoration period roof by cleaning the gutters and downspouts and replacing deteriorated flashing. Roof sheathing should also be checked for proper venting to prevent moisture condensation and water penetration; and to insure that materials are free from insect infestation.

Providing adequate anchorage for roofing material to guard against wind damage and moisture penetration.

Protecting a leaking roof with plywood and building paper until it can be properly repaired.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, that is, if repairs to roofs and roof features will be necessary.

*Repairing* a roof from the restoration period by reinforcing the materials which comprise roof features. Repairs will also generally include the limited replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts of features when there are surviving prototypes such as cupola louvers, dentils, dormer roofing; or slates, tiles, or wood shingles. The new work should be unobtrusively dated to guide future research and treatment.

#### *Not Recommended*

Altering roofs and roof features from the restoration period.

Failing to properly document roof features from the restoration period which may result in their loss.

Changing the type or color of roofing materials unless the work can be substantiated by historical documentation.

Failing to clean and maintain gutters and downspouts properly so that water and debris collect and cause damage to roof fasteners, sheathing, and the underlying structure.

Allowing roof fasteners, such as nails and clips, to corrode so that roofing material is subject to accelerated deterioration.

Permitting a leaking roof to remain unprotected so that accelerated deterioration of historic building materials—masonry, wood, plaster, paint and structural members—occurs.

Failing to undertake adequate measures to assure the protection of roofs and roof features from the restoration period.

Replacing an entire roof feature from the restoration period such as a cupola or dormer when the repair of materials and limited replacement of deteriorated or missing parts are appropriate.

Failing to reuse intact slate or tile when only the roofing substrate needs replacement.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the roof or that is physically or chemically incompatible.

### *Recommended*

**Replacing** in kind an entire roof feature from the restoration period that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model to reproduce the feature. Examples can include a large section of roofing, or a dormer or chimney. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*The following **Restoration** work involves the removal or alteration of existing historic roofs and roof features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing roof features from the restoration period using all new materials in order to create an accurate historic appearance.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering roofs or roof features from other historic periods such as a later dormer or asphalt roofing.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating missing roofing material or a roof feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a dormer or cupola.

### *Not Recommended*

Removing a roof feature from the restoration period that is unreparable, and not replacing it; or failing to document the new work.

### *Not Recommended*

Failing to remove a roof feature from another period, thus confusing the depiction and of the building's significance.

Failing to document roofing materials and roof features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a roof feature that was part of the original design for the building, but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Exterior

### Windows

#### *Recommended*

*Identifying, retaining, and preserving* windows—and their functional and decorative features—from the restoration period. Such features can include frames, sash, muntins, glazing, sills, heads, hoodmolds, panelled or decorated jambs and moldings, and interior and exterior shutters and blinds.

Conducting an indepth survey of the condition of existing windows from the restoration period early in the planning process so that repair and upgrading methods and possible replacement options can be fully explored.

*Protecting and maintaining* the wood and architectural metals from the restoration period which comprise the window frame, sash, muntins, and surrounds through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

Making windows weathertight by re-caulking, and replacing or installing weatherstripping. These actions also improve thermal efficiency.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, i.e. if repairs to windows and window features will be required.

#### *Not Recommended*

Altering windows or window features from the restoration period.

Failing to properly document window features from the restoration period which may result in their loss.

Applying paint or other coatings to window features or removing them if such treatments cannot be documented to the restoration period.

Changing the type or color of protective surface coatings on window features unless the work can be substantiated by historical documentation.

Stripping windows of sound material such as wood, cast iron, and bronze.

Replacing windows from the restoration period solely because of peeling paint, broken glass, stuck sash, and high air infiltration. These conditions, in themselves, are no indication that windows are beyond repair.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of the window results.

Retrofitting or replacing windows from the restoration period rather than maintaining the sash, frame, and glazing.

Failing to undertake adequate measures to assure the protection of window materials from the restoration period.

### *Recommended*

*Repairing* window frames and sash from the restoration period by patching, splicing, consolidating or otherwise reinforcing. Such repair may also include replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts when there are surviving prototypes such as architraves, hoodmolds, sash, sills, and interior or exterior shutters and blinds. The new work should be unobtrusively dated to guide future research and treatment.

*Replacing* in kind a window feature from the restoration period that is too deteriorated to repair using the same sash and pane configuration and other design details. If using the same kind of material is not technically or economically feasible when replacing windows deteriorated beyond repair, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

### *Not Recommended*

Replacing an entire window from the restoration period when repair of materials and limited replacement of deteriorated or missing parts are appropriate.

Failing to reuse serviceable window hardware such as brass sash lifts and sash locks.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the window or that is physically or chemically incompatible.

Removing a window feature from the restoration period that is unrepairable and not replacing it; or failing to document the new work.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic windows and window features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing window features from the restoration period using all new materials.*

*Recommended*

**Removing Existing Features from Other Historic Periods**

Removing or altering windows or window features from other historic periods, such as later single-pane glazing or inappropriate shutters.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

**Re-creating Missing Features from the Restoration Period**

Re-creating a missing window or window feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a hoodmold or shutter.

*Not Recommended*

Failing to remove a window feature from another period, thus confusing the depiction of the building's significance.

Failing to document window features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a window feature that was part of the original design for the building, but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.



## Building Exterior

### Entrances and Porches

#### *Recommended*

*Identifying, retaining, and preserving* entrances and porches from the restoration period—and their functional and decorative features—such as doors, fanlights, sidelights, pilasters, entablatures, columns, balustrades, and stairs.

*Protecting and maintaining* the masonry, wood, and architectural metals that comprise restoration period entrances and porches through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and re-application of protective coating systems.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, that is, if repairs to entrance and porch features will be necessary.

#### *Not Recommended*

Altering entrances and porch features from the restoration period.

Failing to properly document entrance and porch features from the restoration period which may result in their loss

Applying paint or other coatings to entrance and porch features or removing them if such treatments cannot be documented to the restoration period.

Changing the type or color of protective surface coatings on entrance and porch features unless the work can be substantiated by historical documentation.

Stripping entrances and porches of sound material such as wood, iron, cast iron, terra cotta, tile and brick.

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of entrances and porches results.

Failing to undertake adequate measures to assure the protection of historic entrances and porches from the restoration period.

*Recommended*

*Repairing* entrances and porches from the restoration period by reinforcing the historic materials. Repairs will also generally include the limited replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts of repeated features where there are surviving prototypes such as balustrades, cornices, entablatures, columns, sidelights, and stairs. The new work should be unobtrusively dated to guide future research and treatment.

*Replacing* in kind an entire entrance or porch from the restoration period that is too deteriorated to repair—if the form and detailing are still evident—using the physical evidence as a model to reproduce the feature. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*Not Recommended*

Replacing an entire entrance or porch feature from the restoration period when the repair of materials and limited replacement of parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the entrance and porch or that is physically or chemically incompatible.

Removing an entrance or porch feature from the restoration period that is unrepairable and not replacing it; or failing to document the new work.

*Portions of the small porch on an Italianate mansion were carefully numbered prior to Restoration. Some original elements were restored in place, while others had to be removed for repair, then reinstalled. Any element too deteriorated to save was replaced with a new one replicated to match the original design. Photo: Morgan W. Phillips.*

## Restoration

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic entrance and porch features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing entrance and porch features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering entrances and porches and their features from other historic periods such as a later porch railing or balustrade.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing entrance or porch or its features that existed during the restoration period based on physical or documentary evidence; for example, duplicating a fanlight or porch column.

### *Not Recommended*

Failing to remove an entrance or porch feature from another period, thus confusing the depiction of the building's significance.

Failing to document entrance or porch features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing an entrance or porch feature that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Exterior

### Storefronts

#### *Recommended*

*Identifying, retaining, and preserving* storefronts from the restoration period—and their functional and decorative features—such as display windows, signs, doors, transoms, kick plates, corner posts, and entablatures.

*Protecting and maintaining* masonry, wood, and architectural metals which comprise restoration period storefronts through appropriate treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coating systems.

Protecting storefronts against arson and vandalism before restoration work begins by boarding up windows and installing alarm systems that are keyed into local protection agencies.

Evaluating the existing condition of storefront materials to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

#### *Not Recommended*

Altering storefronts—and their features—from the restoration period.

Failing to properly document storefront features from the restoration period which may result in their loss.

Applying paint or other coatings to storefront features or removing them if such treatments cannot be documented to the restoration period.

Changing the type or color of protective surface coatings on storefront features unless the work can be substantiated by historical documentation.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of storefront features results.

Permitting entry into the building through unsecured or broken windows and doors so that interior features and finishes are damaged by exposure to weather or vandalism.

Stripping storefronts of historic material from the restoration period such as wood, cast iron, terra cotta, carrara glass, and brick.

Failing to undertake adequate measures to assure the protection of storefront materials from the restoration period.

### *Recommended*

**Repairing** storefronts from the restoration period by reinforcing the historic materials. Repairs will also generally include the limited replacement in kind—or with compatible substitute materials—of those extensively deteriorated or missing parts of storefronts where there are surviving prototypes such as transoms, kick plates, pilasters, or signs. The new work should be unobtrusively dated to guide future research and treatment.

**Replacing** in kind a storefront from the restoration period that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model. If using the same material is not technically or economically feasible, then compatible substitute materials may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic storefront features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing storefront features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering storefronts and their features from other historic periods such as inappropriate cladding or signage.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing storefront or storefront feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a display window or transom.

### *Not Recommended*

Replacing an entire storefront feature from the restoration period when repair of materials and limited replacement of its parts are appropriate.

Using substitute material for the replacement part that does not convey the same visual appearance as the surviving parts of the storefront or that is physically or chemically incompatible.

Removing a storefront feature from the restoration period that is unrepairable, and not replacing it; or failing to document the new work.

### *Not Recommended*

Failing to remove a storefront feature from another period, thus confusing the depiction of the building's significance.

Failing to document storefront features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a storefront feature that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Interior

### Structural Systems

#### *Recommended*

*Identifying, retaining, and preserving* structural systems from the restoration period—and individual features of systems—such as post and beam systems, trusses, summer beams, vigas, cast iron columns, above-grade stone foundation walls, or loadbearing brick or stone walls.

*Protecting and maintaining* the structural system by cleaning the roof gutters and downspouts; replacing roof flashing; keeping masonry, wood, and architectural metals in a sound condition; and ensuring that structural members are free from insect infestation.

Examining and evaluating the physical condition of the structural system and its individual features using non-destructive techniques such as X-ray photography.

*Repairing* the structural system by augmenting or upgrading individual parts or features in a manner that is consistent with the restoration period. For example, weakened structural members such as floor framing can be paired with a new member, braced, or otherwise supplemented and reinforced. The new work should be unobtrusively dated to guide future research and treatment.

#### *Not Recommended*

Altering visible features of structural systems from the restoration period.

Failing to properly document structural systems from the restoration period which may result in their loss.

Overloading the existing structural system; or installing equipment or mechanical systems which could damage the structure.

Replacing a loadbearing masonry wall that could be augmented and retained.

Leaving known structural problems untreated such as deflection of beams, cracking and bowing of walls, or racking of structural members.

Failing to provide proper building maintenance so that deterioration of the structural system results. Causes of deterioration include subsurface ground movement, vegetation growing too close to foundation walls, improper grading, fungal rot, and poor interior ventilation that results in condensation.

Utilizing destructive probing techniques that will damage or destroy structural material.

Upgrading the building structurally in a manner that diminishes the historic character of the exterior, such as installing strapping channels or removing a decorative cornice; or that damages interior features or spaces.

Replacing a structural member or other feature of the structural system when it could be augmented and retained.

### *Recommended*

**Replacing** in kind—or with substitute material—those portions or features of the structural system that are either extensively deteriorated or are missing when there are surviving prototypes such as cast iron columns, roof rafters or trusses, or sections of loadbearing walls. Substitute material should convey the same form, design, and overall visual appearance as the historic feature; and, at a minimum, be equal to its loadbearing capabilities. The new work should be unobtrusively dated to guide future research and treatment.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic structural systems and features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing structural system features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering visually intrusive structural features from other historic periods such as a non-matching column or exposed ceiling beams.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing structural feature that existed during the restoration period based on physical or documentary evidence; for example, duplicating a viga or cast iron column.

### *Not Recommended*

Installing a visible replacement feature that does not convey the same visual appearance, e.g., replacing an exposed wood summer beam with a steel beam; or failing to document the new work.

Using substitute material that does not equal the loadbearing capabilities of the historic material and design or is otherwise physically or chemically incompatible.

### *Not Recommended*

Failing to remove or alter a visually intrusive structural feature from another period, thus confusing the depiction of the building's significance.

Failing to document structural features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a structural feature that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Interior

### Spaces, Features, and Finishes

#### *Recommended*

#### Interior Spaces

*Identifying, retaining, and preserving* a floor plan or interior spaces from the restoration period. This includes the size, configuration, proportion, and relationship of rooms and corridors; the relationship of features to spaces; and the spaces themselves, such as lobbies, reception halls, entrance halls, double parlors, theaters, auditoriums, and important industrial or commercial spaces.

#### Interior Features and Finishes

*Identifying, retaining, and preserving* interior features and finishes from the restoration period. These include columns, cornices, baseboards, fireplaces and mantels, panelling, light fixtures, hardware, and flooring; and wallpaper, plaster, paint, and finishes such as stencilling, marbling, and graining; and other decorative materials that accent interior features and provide color, texture, and patterning to walls, floors, and ceilings.

*Protecting and maintaining* masonry, wood, and architectural metals that comprise restoration period interior features through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coating systems.

#### *Not Recommended*

Altering a floor plan or interior spaces—including individual rooms—from the restoration period.

Altering features or finishes from the restoration period.

Failing to properly document spaces, features, and finishes from the restoration period which may result in their loss.

Applying paint, plaster, or other finishes to surfaces unless the work can be substantiated historical documentation.

Stripping paint to bare wood rather than repairing or reapplying grained or marbled finishes from the restoration period to features such as doors and panelling.

Changing the type of finish or its color, such as painting a previously varnished wood feature, unless the work can be substantiated by historical documentation.

Failing to provide adequate protection to materials on a cyclical basis so that deterioration of interior features results.



### *Recommended*

Protecting interior spaces, features and finishes against arson and vandalism before project work begins, erecting protective fencing, boarding-up windows, and installing fire alarm systems that are keyed to local protection agencies.

Protecting interior features such as a staircase, mantel, or decorative finishes and wall coverings against damage during project work by covering them with heavy canvas or plastic sheets.

Installing protective coverings in areas of heavy pedestrian traffic to protect historic features such as wall coverings, parquet flooring and panelling.

Removing damaged or deteriorated paints and finishes to the next sound layer using the gentlest method possible, then repainting or refinishing using compatible paint or other coating systems based on historical documentation.

Repainting with colors that are documented to the building's restoration period.

Limiting abrasive cleaning methods to certain industrial warehouse buildings where the interior masonry or plaster features do not have distinguishing design, detailing, tooling, or finishes; and where wood features are not finished, molded, beaded, or worked by hand. Abrasive cleaning should only be considered after other, gentler methods have been proven ineffective.

Evaluating the existing condition of materials to determine whether more than protection and maintenance are required, that is, if repairs to interior features and finishes will be necessary.

### *Not Recommended*

Permitting entry into historic buildings through unsecured or broken windows and doors so that the interior features and finishes are damaged by exposure to weather or vandalism.

Stripping interiors of restoration period features such as woodwork, doors, windows, light fixtures, copper piping, radiators; or of decorative materials.

Failing to provide proper protection of interior features and finishes during work so that they are gouged, scratched, dented, or otherwise damaged.

Failing to take new use patterns into consideration so that interior features and finishes are damaged.

Using destructive methods such as propane or butane torches or sandblasting to remove paint or other coatings. These methods can irreversibly damage the historic materials that comprise interior features.

Using new paint colors that are inappropriate to the building's restoration period.

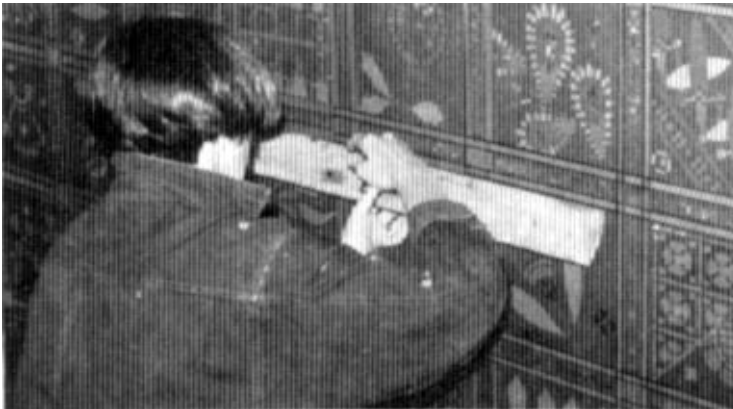
Changing the texture and patina of features from the restoration period through sandblasting or use of abrasive methods to remove paint, discoloration or plaster. This includes both exposed wood (including structural members) and masonry.

Failing to undertake adequate measures to assure the protection of interior features and finishes.

*Recommended*

**Repairing** interior features and finishes from the restoration period by reinforcing the historic materials. Repair will also generally include the limited replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts of repeated features when there are surviving prototypes such as stairs, balustrades, wood panelling, columns; or decorative wall coverings or ornamental tin or plaster ceilings. The new work should be unobtrusively dated to guide future research and treatment.

**Replacing** in kind an entire interior feature or finish from the restoration period that is too deteriorated to repair—if the overall form and detailing are still evident—using the physical evidence as a model for reproduction. Examples could include wainscoting, a tin ceiling, or interior stairs. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*Not Recommended*

Replacing an interior feature from the restoration period such as a staircase, panelled wall, parquet floor, or cornice; or finish such as a decorative wall covering or ceiling when repair of materials and limited replacement of such parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts or portions of the interior feature or finish or that is physically or chemically incompatible.

Removing a feature or finish from the restoration period that is unrepairable and not replacing it; or failing to document the new work.



*A complete paint investigation often needs to be conducted during Restoration. Paint samples are carefully collected onsite. In the laboratory, an ultra violet light is used to identify pigment and binding media. Paint samples are then photographed. Physical evidence documented through laboratory research provides a sound basis for an accurate restoration of painted finishes, such as the complex stencilling pictured here. Photo left: Courtesy, Alexis Elza; Photo right: Courtesy, Andrea Gilmore.*

## Restoration

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic interior spaces, features, and finishes that would be retained in *Preservation and Rehabilitation* treatments; and the replacement of missing interior spaces, features, and finishes from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering interior spaces, features and finishes from other historic periods such as a later suspended ceiling or wood panelling.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating an interior space, or a missing feature or finish from the restoration period based on physical or documentary evidence; for example, duplicating a marbled mantel or a staircase.

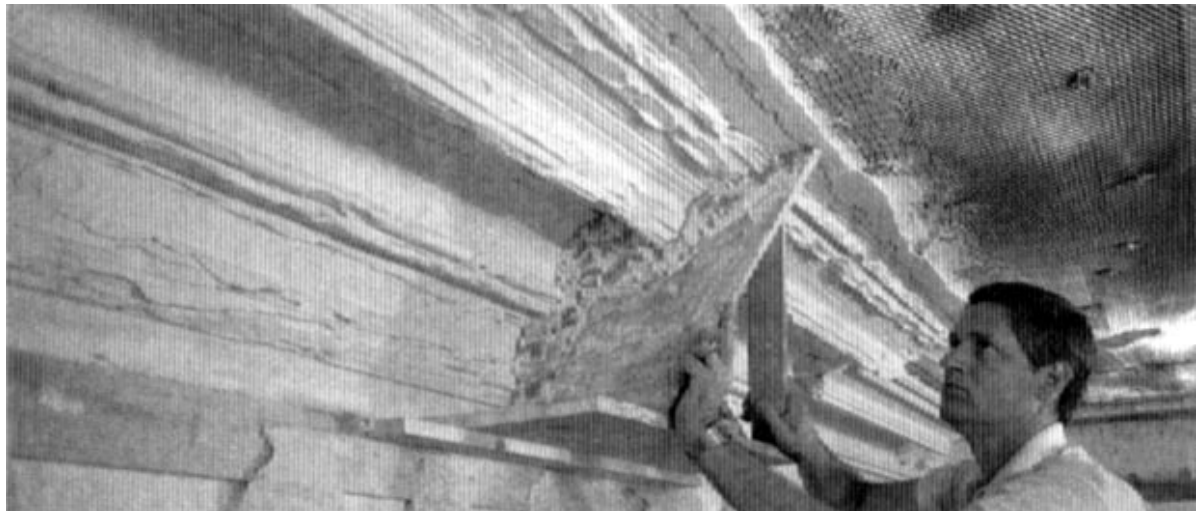
### *Not Recommended*

Failing to remove or alter an interior space, feature, or finish from another period, thus confusing the depiction of the building's significance.

Failing to document interior spaces, features, and finishes from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing an interior space, feature, or finish that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

*The missing plaster cornice was restored as part of an overall project to return a residence to its original appearance. The traditional method of producing a cornice is unchanged today. Photo: Old-House Journal.*



## Building Interior

### Mechanical Systems: Heating, Air Conditioning, Electrical, and Plumbing

#### *Recommended*

*Identifying, retaining, and preserving* visible features of mechanical systems from the restoration period such as radiators, vents, fans, grilles, plumbing fixtures, switchplates, and lights.

*Protecting and maintaining* mechanical, plumbing, and electrical systems and their features from the restoration period through cyclical cleaning and other appropriate measures.

Preventing accelerated deterioration of mechanical systems by providing adequate ventilation of attics, crawlspaces, and cellars so that moisture problems are avoided.

Improving the energy efficiency of existing mechanical systems to help reduce the need for elaborate new equipment.

*Repairing* mechanical systems from the restoration period by augmenting or upgrading system parts, such as installing new pipes and ducts; rewiring; or adding new compressors or boilers.

*Replacing* in kind—or with compatible substitute material—those visible features of restoration period mechanical systems that are either extensively deteriorated or are prototypes such as ceiling fans, switchplates, radiators, grilles, or plumbing fixtures.

Installing a new mechanical system, if required, in a way that results in the least alteration possible to the building.

#### *Not Recommended*

Altering visible decorative features of mechanical systems from the restoration period.

Failing to properly document mechanical systems and their visible decorative features from the restoration period which may result in their loss.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of mechanical systems and their visible features results.

Enclosing mechanical systems in areas that are not adequately ventilated so that deterioration of the systems results.

Installing unnecessary air conditioning or climate control systems which can add excessive moisture to the building. This additional moisture can either condense inside, damaging interior surfaces, or pass through interior walls to the exterior, potentially damaging adjacent materials as it migrates.

Replacing a mechanical system from the restoration period or its functional parts when it could be upgraded and retained.

Installing a visible replacement feature that does not convey the same visual appearance.

Installing a new mechanical system so that structural or interior features from the restoration period are altered.

## Restoration

### *Recommended*

Providing adequate structural support for new mechanical equipment.

Installing the vertical runs of ducts, pipes, and cables in closets, service rooms, and wall cavities.

Installing air conditioning units in such a manner that features are not damaged or obscured and excessive moisture is not generated that will accelerate deterioration of historic materials.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic mechanical systems and features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing mechanical systems and features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering mechanical systems and features from other historic periods such as a later elevator or plumbing fixture.

Documenting materials and features dating from other periods prior to their alteration or removal. If possible, selected examples of these features or materials should be stored to facilitate future research.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing feature of the mechanical system that existed during the restoration period based on physical or documentary evidence; for example, duplicating a heating vent or gaslight fixture.

### *Not Recommended*

Failing to consider the weight and design of new mechanical equipment so that, as a result, historic structural members or finished surfaces are weakened or cracked.

Installing vertical runs of ducts, pipes, and cables in places where they will obscure features from the restoration period.

Concealing mechanical equipment in walls or ceilings in a manner that requires the removal of building material from the restoration period.

Cutting through features such as masonry walls in order to install air conditioning units.

### *Not Recommended*

Failing to remove a mechanical system or feature from another period, thus confusing the depiction of the building's significance.

Failing to document mechanical systems and features from other historic periods that are removed from the building so that a valuable portion of the historic record is lost.

Constructing a mechanical system or feature that was part of the original design for the building but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Building Site

### *Recommended*

Identifying, retaining, and preserving restoration period buildings and their features as well as features of the site. Site features may include circulation systems such as walks, paths, roads, or parking; vegetation such as trees, shrubs, fields, or herbaceous plant material; landforms such as terracing, berms or grading; furnishings such as lights, fences, or benches; decorative elements such as sculpture, statuary or monuments; water features including fountains, streams, pools, or lakes; and subsurface archeological features which are important in defining the restoration period.



### *Not Recommended*

Altering buildings and their features or site features from the restoration period.

Failing to properly document building and site features from the restoration period which may result in their loss.



*This ca. 1900 photograph (left) would be invaluable to guide restoration of the deteriorated house (right) to its documented earlier appearance, complete with decorative trim, shutters, polychromed exterior, and fencing. Photos: Courtesy, North Carolina Department of Archives and History.*

### *Recommended*

Re-establishing the relationship between buildings and the landscape that existed during the restoration period.

*Protecting and maintaining* buildings and the site by providing proper drainage to assure that water does not erode foundation walls; drain toward the building; or damage or erode the landscape.

Minimizing disturbance of terrain around buildings or elsewhere on the site, thus reducing the possibility of destroying or damaging important landscape features or archeological resources.

Surveying and documenting areas where the terrain will be altered during restoration work to determine the potential impact to landscape features or archeological resources.

Protecting, e.g., preserving in place, important archeological resources.

Planning and carrying out any necessary investigation using professional archeologists and modern archeological methods when preservation in place is not feasible.

Preserving important landscape features from the restoration period, including ongoing maintenance of historic plant material.

Protecting building and landscape features against arson and vandalism before restoration work begins, i.e., erecting protective fencing and installing alarm systems that are keyed into local protection agencies.

### *Not Recommended*

Retaining non-restoration period buildings or landscape features.

Failing to maintain adequate site drainage so that buildings and site features are damaged or destroyed; or alternatively, changing the site grading so that water no longer drains properly.

Introducing heavy machinery into areas where it may disturb or damage important landscape features or archeological resources.

Failing to survey the building site prior to beginning restoration work which results in damage to, or destruction of, landscape features or archeological resources.

Leaving known archeological material unprotected so that it is damaged during restoration work.

Permitting unqualified personnel to perform data recovery on archeological resources so that improper methodology results in the loss of important archeological material.

Allowing restoration period landscape features to be lost or damaged due to a lack of maintenance.

Permitting the property to remain unprotected so that the building and landscape features or archeological resources are damaged or destroyed.

Removing restoration period features from the building or site such as wood siding, iron fencing, masonry balustrades, or plant material.

*Recommended*

Providing continued protection of building materials and plant features from the restoration period through appropriate cleaning, rust removal, limited paint removal, and re-application of protective coating systems; and pruning and vegetation management.

Evaluating the existing condition of materials and features to determine whether more than protection and maintenance are required, that is, if repairs to building and site features will be necessary.

*Repairing* restoration period features of the building and site by reinforcing historic materials. The new work should be unobtrusively dated to guide future research and treatment.

*Replacing* in kind an entire restoration period feature of the building or site that is too deteriorated to repair if the overall form and detailing are still evident. Physical evidence from the deteriorated feature should be used as a model to guide the new work. This could include an entrance or porch, walkway, or fountain. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

Replacing deteriorated or damaged landscape features of the restoration period in kind or with compatible substitute material. The replacement feature should be based on physical evidence and convey the same appearance.

*Not Recommended*

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of building and site features results.

Failing to undertake adequate measures to assure the protection of building and site features.

Replacing an entire restoration period feature of the building or site such as a fence, walkway, or driveway when repair of materials and limited compatible replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the building or site feature or that is physically or chemically incompatible.

Removing a restoration period feature of the building or site that is unrepairable and not replacing it; or failing to document the new work.

Adding conjectural landscape features to the site such as period reproduction lamps, fences, fountains, or vegetation that are historically inappropriate, thus creating an inaccurate depiction of the restoration period.



## Restoration

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing historic building site features that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing building site features from the restoration period using all new materials.*

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering features of the building or site from other historic periods such as a later outbuilding, paved road, or overgrown tree.

Documenting features of the building or site from other periods prior to their alteration or removal.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing feature of the building or site that existed during the restoration period based on physical or documentary evidence; for example, duplicating a terrace, gazebo, or fencing.

### *Not Recommended*

Failing to remove a feature of the building or site from another period, thus creating an inaccurate historic appearance.

Failing to document features of the building or site from other historic periods that are removed during restoration so that a valuable portion of the historic record is lost.

Constructing a feature of the building or site that was part of the original design, but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.

## Setting (District/Neighborhood)

### *Recommended*

**Identifying retaining, and preserving** restoration period building and landscape features of the setting. Such features can include roads and streets, furnishings such as lights or benches, vegetation, gardens and yards, adjacent open space such as fields, parks, commons or woodlands, and important views or visual relationships.

Re-establishing the relationship between buildings and landscape features of the setting that existed during the restoration period.

**Protecting and maintaining** building materials and plant features from the restoration period through appropriate cleaning, rust removal, limited paint removal, and reapplication of protective coating systems; and pruning and vegetation management.

Protecting buildings and landscape features against arson and vandalism before restoration work begins by erecting protective fencing and installing alarm systems that are keyed into local protection agencies.

Evaluating the existing condition of the building and landscape features to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

**Repairing** restoration period features of the building and landscape by reinforcing the historic materials. Repair will generally include the replacement in kind—or with compatible substitute material—of those extensively deteriorated or missing parts of features where there are surviving prototypes such as porch balustrades or paving materials. The new work should be unobtrusively dated to guide future research and treatment.

### *Not Recommended*

Altering features of the setting that can be documented to the restoration period.

Failing to properly document restoration period building and landscape features, which may result in their loss.

Retaining non-restoration period buildings or landscape features.

Failing to provide adequate protection of materials on a cyclical basis which results in the deterioration of building and landscape features.

Permitting the building and setting to remain unprotected so that interior or exterior features are damaged.

Stripping or removing features from buildings or the setting such as wood siding, iron fencing, terra cotta balusters, or plant material.

Failing to undertake adequate measures to assure the protection of building and landscape features.

Replacing an entire restoration period feature of the building or landscape setting when repair of materials and limited replacement of deteriorated or missing parts are appropriate.

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the building or landscape, or that is physically, chemically, or ecologically incompatible.

### *Recommended*

**Replacing** in kind an entire restoration period feature of the building or landscape that is too deteriorated to repair—when the overall form and detailing are still evident—using the physical evidence as a model to guide the new work. If using the same kind of material is not technically or economically feasible, then a compatible substitute material may be considered. The new work should be unobtrusively dated to guide future research and treatment.

*The following **Restoration** work is highlighted to indicate that it involves the removal or alteration of existing features of the historic setting that would be retained in Preservation and Rehabilitation treatments; and the replacement of missing features from the restoration period using all new materials.*

### *Not Recommended*

Removing a restoration period feature of the building or landscape that is unrepairable and not replacing it; or failing to document the new work.

### *Recommended*

#### **Removing Existing Features from Other Historic Periods**

Removing or altering features of the building or landscape from other historic periods, such as a later road, sidewalk, or fence.

Documenting features of the building or landscape dating from other periods prior to their alteration or removal.

#### **Re-creating Missing Features from the Restoration Period**

Re-creating a missing feature of the building or landscape in the setting that existed during the restoration period based on physical or documentary evidence; for example, duplicating a path or park bench.

### *Not Recommended*

Failing to remove a feature of the building or landscape from another period, thus creating an inaccurate historic appearance.

Failing to document features of the building or landscape from other historic periods that are removed from the setting so that a valuable portion of the historic record is lost.

Constructing a feature of the building or landscape that was part of the original design for the setting but was never actually built; or constructing a feature which was thought to have existed during the restoration period, but for which there is insufficient documentation.



*The Bronson-Mulholland House in Palatka, Florida, ca. 1845, is shown (a) before and (b) after the treatment, Restoration. Over the years the east (far right) side of the veranda had been filled in as a sixth bay. During the restoration, this later infill was removed and the east veranda, together with its flooring, stairs, and foundation, restored. Photo: City of Palatka, Community Development Department.*



*Although the work in the following sections is quite often an important aspect of restoration projects, it is usually not part of the overall process of preserving features from the restoration period (protection, stabilization, conservation, repair, and replacement); rather, such work is assessed for its potential negative impact on the building's historic appearance. For this reason, particular care must be taken not to obscure, alter, or damage features from the restoration period in the process of undertaking work to meet code and ener-*

### Energy Efficiency

#### *Recommended*

#### *Masonry/Wood/Architectural Metals*

Installing thermal insulation in attics and in unheated cellars and crawlspaces to increase the efficiency of the existing mechanical systems.

Installing insulating material on the inside of masonry walls to increase energy efficiency where there is no interior molding around the windows or other interior architectural detailing from the restoration period.

#### *Windows*

Utilizing the inherent energy conserving features of a building by maintaining windows and louvered blinds from the restoration period in good operable condition for natural ventilation.

Improving thermal efficiency with weatherstripping, storm windows, caulking, interior shades, and if historically appropriate, blinds and awnings.

Installing interior storm windows with air-tight gaskets, ventilating holes, and/or removable clips to ensure proper maintenance and to avoid condensation damage to historic windows.

Installing exterior storm windows which do not damage or obscure the windows and frames.

#### *Not Recommended*

Applying thermal insulation with a high moisture content in wall cavities which may damage historic fabric.

Installing wall insulation without considering its effect on interior or other architectural detailing.

Using shading devices that are inappropriate to the restoration period.

Replacing multi-paned sash from the restoration period with new thermal sash utilizing false muntins.

Installing interior storm windows that allow moisture to accumulate and damage the window.

Installing new exterior storm windows which are inappropriate in size or color.

Replacing windows or transoms from the restoration period with fixed thermal glazing or permitting windows and transoms to remain inoperable rather than utilizing them for their energy conserving potential.

*Recommended**Entrances and Porches*

Maintaining porches and double vestibule entrances from the restoration period so that they can retain heat or block the sun and provide natural ventilation.

*Interior Features*

Retaining interior shutters and transoms from the restoration period for their inherent energy conserving features.

*Mechanical Systems*

Improving energy efficiency of existing mechanical systems by installing insulation in attics and basements.

*Building Site*

Retaining plant materials, trees, and landscape features which perform passive solar energy functions, such as sun shading and wind breaks, if appropriate to the restoration period.

*Setting (District/Neighborhood)*

Maintaining those existing landscape features which moderate the effects of the climate on the setting such as deciduous trees, evergreen wind-blocks, and lakes or ponds, if appropriate to the restoration period.

*Not Recommended*

Changing porches significant to the restoration period by enclosing them.

Removing interior features from the restoration period that play a secondary energy conserving role.

Replacing existing mechanical systems that could be repaired for continued use.

Removing plant materials, trees, and landscape features from the restoration period that perform passive solar energy functions.

Stripping the setting of landscape features and landforms from the restoration period so that effects of the wind, rain, and sun result in accelerated deterioration of the historic building.

### Accessibility Considerations

#### *Recommended*

Identifying spaces, features, and finishes from the restoration period so that accessibility code-required work will not result in their damage or loss.

Complying with barrier-free access requirements in such a manner that spaces, features, and finishes from the restoration period are preserved.

Working with local disability groups, access specialists, and historic preservation specialists to determine the most appropriate solution to access problems.

Providing barrier-free access that promotes independence for to the highest degree practicable, while preserving significant historic features.

Finding solutions to meet accessibility requirements that minimize the impact on the historic building and its site, such as compatible ramps, paths, and lifts.

#### *Not Recommended*

Undertaking code-required alterations before identifying those spaces, features, or finishes from the restoration period which must be preserved.

Altering, damaging, or destroying features from the restoration period in attempting to comply with accessibility requirements.

Making changes to buildings without first seeking expert advice from access specialists and historic preservationists to determine solutions.

Making access modifications that do not provide a reasonable balance between independent, safe access and preservation of historic features.

Making modifications for accessibility without considering the impact on the historic building and its site.

## Health and Safety Considerations

### *Recommended*

Identifying spaces, features, and finishes from the restoration period so that code-required work will not result in their damage or loss.

Complying with health and safety codes, including seismic code requirements, in such a manner that spaces, features, and finishes from the restoration period are preserved.

Removing toxic building materials only after thorough testing has been conducted and only after less invasive abatement methods have been shown to be inadequate.

Providing workers with appropriate personal protective equipment for hazards found at the worksite.

Working with local code officials to investigate systems, methods, or devices of equivalent or superior effectiveness and safety to those prescribed by code so that unnecessary alterations can be avoided.

Upgrading historic stairways and elevators from the restoration period to meet health and safety codes in a manner that assures their preservation, i.e., so that they are not damaged or obscured.

Installing sensitively designed fire suppression systems, such as sprinkler systems, that result in retention of features and finishes from the restoration period.

Applying fire-retardant coatings, such as intumescent paints, which expand during fire to add thermal protection to steel.

Adding a new stairway or elevator to meet health and safety codes in a manner that preserves adjacent features and spaces from the restoration period.

### *Not Recommended*

Undertaking code-required alterations to a building or site before identifying those spaces, features, or finishes from the restoration period which must be preserved.

Altering, damaging, or destroying spaces, features, and finishes while making modifications to a building or site to comply with safety codes.

Destroying interior features and finishes from the restoration period without careful testing and without considering less invasive abatement methods.

Removing unhealthful building materials without regard to personal and environmental safety.

Making changes to historic buildings without first exploring equivalent health and safety systems, methods, or devices that may be less damaging to spaces, features, and finishes from the restoration period.

Damaging or obscuring stairways and elevators or altering adjacent spaces from the restoration period in the process of doing work to meet code requirements.

Covering wood features from the restoration period with fire-resistant sheathing which results in altering their visual appearance.

Using fire-retardant coatings if they damage or obscure features from the restoration period.

Altering the appearance of spaces, features, or finishes from the restoration period when adding a new code-required stairway or elevator.