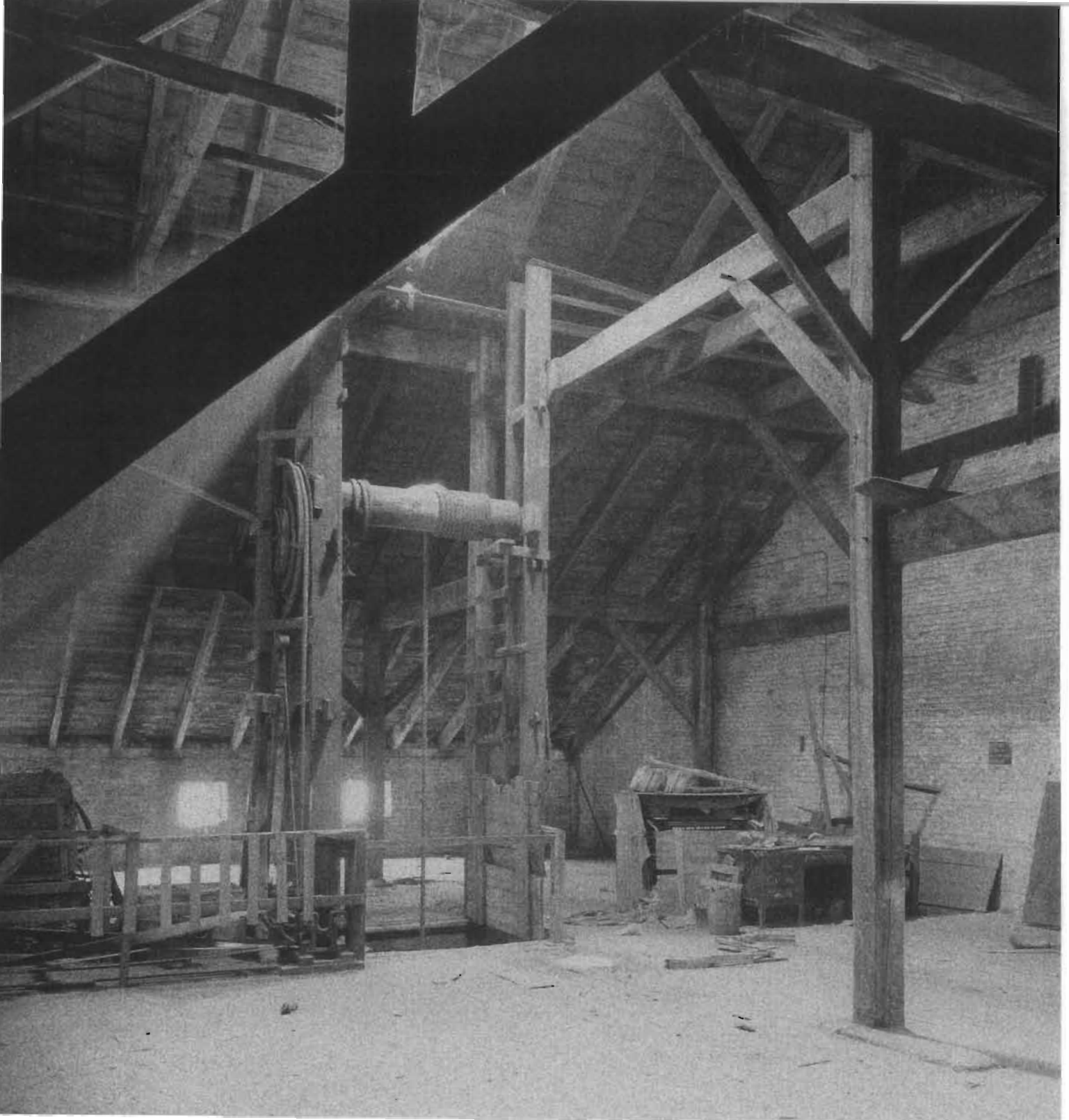


Building Interior

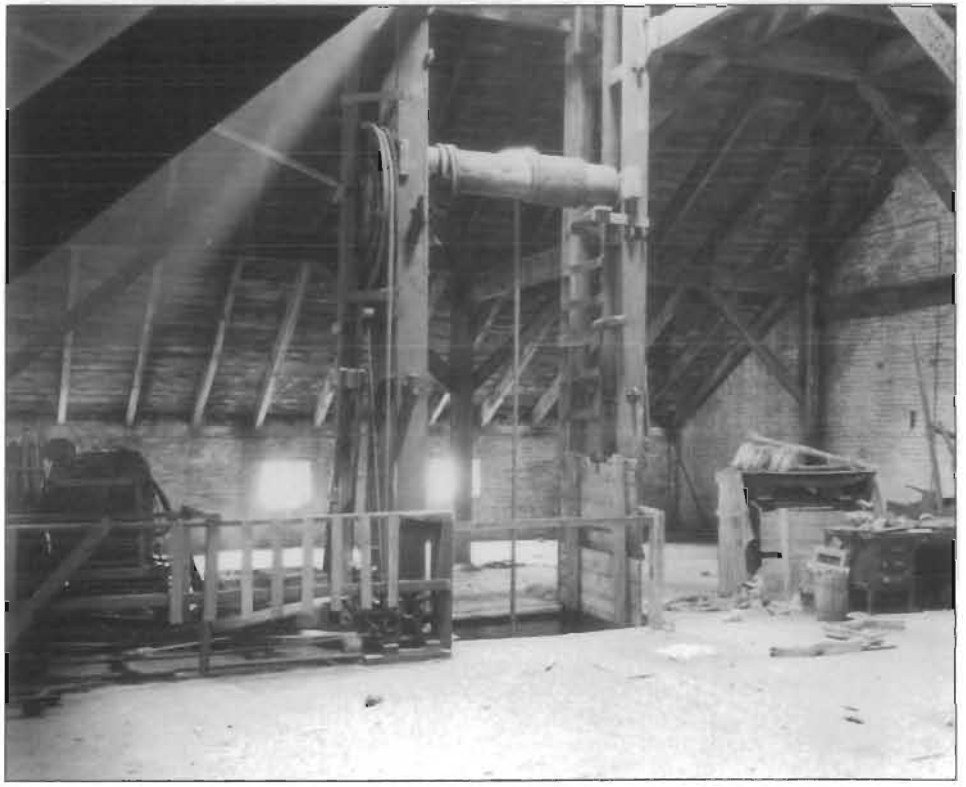
Structural Systems

Building Interior

Structural Systems

If features of the structural system are exposed such as loadbearing brick walls, cast iron columns, roof trusses, posts and beams, vigas, or stone foundation walls, they may be important in defining the building's overall historic character. Unexposed structural features that are not character-defining or an entire structural system may nonetheless be significant in the history of building technology; therefore, the structural system should always be examined and evaluated early in the project planning stage to determine both its physical condition and its importance to the building's historic character or historical significance.

The types of structural systems found in America include, but certainly are not limited, to the following: wooden frame construction (17th c.), balloon frame construction (19th c.), loadbearing masonry construction (18th c.), brick cavity wall construction (19th c.), heavy timber post and beam industrial construction (19th c.), fireproof iron construction (19th c.), heavy masonry and steel construction (19th c.), skeletal steel construction (19th c.), and concrete slab and post construction (20th c.).



Recommended

Identify, retain, and preserve

Identifying, retaining, and preserving structural systems—and individual features of systems—that are important in defining the overall historic character of the building, such as post and beam systems, trusses, summer beams, vigas, cast iron columns, above-grade stone foundation walls, or loadbearing brick or stone walls.

The exposed metal roof-truss system of this waiting room not only provides structural support, but is also important in defining the interior character of the train station.

Protect and maintain

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 assuring that structural members are free from insect infestation.

Not Recommended

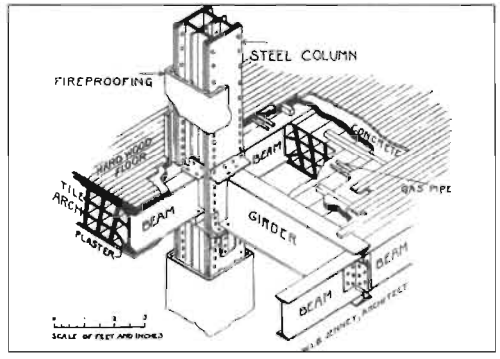
Removing, covering, or radically changing features of structural systems which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Putting a new use into the building which could overload the existing structural system; or installing equipment or mechanical systems which could damage the structure.

Demolishing a loadbearing masonry wall that could be augmented and retained, and replacing it with a new wall (i.e., brick or stone), using the historic masonry only as an exterior veneer.

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

Utilizing treatments or products that accelerate the deterioration of structural material such as introducing urea-formaldehyde foam insulation into frame walls.

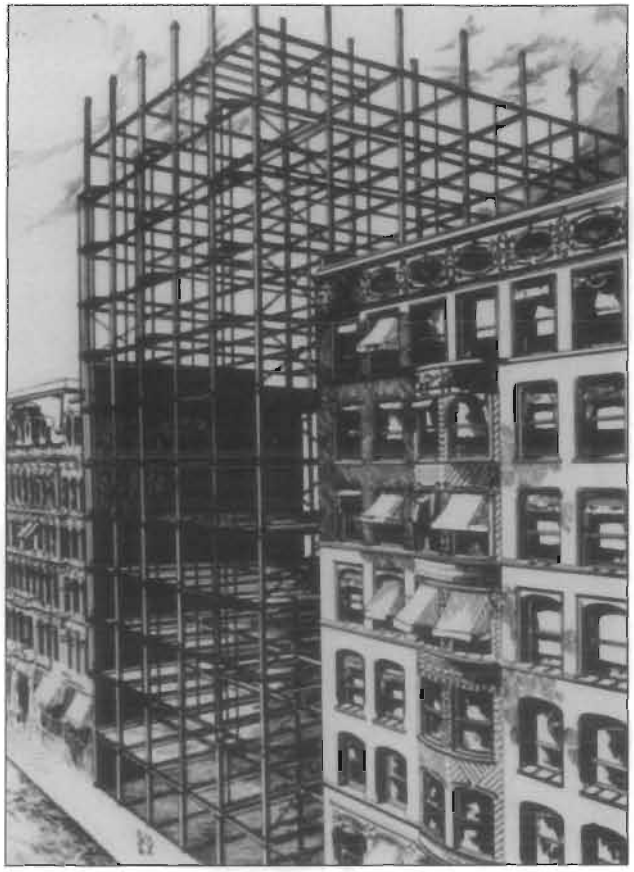


Detail of a column and girder connection and floor construction, The Fair Store, Chicago, Illinois, 1892 (Jenney and Mundie, architects). *This type of connection was used in many iron and steel buildings; "fireproofing" was provided by terra-cotta tile and plaster.*

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.

Photo: Irving B. Haynes and Associates

In order to preserve this historic wood-frame building, new steel framing was inserted to reinforce the wood post and beam structure. Original wood framing members were notched to accommodate the new steel frame.



Iron and Steel Skeleton Frame, Unity Building, Chicago, Illinois, 1891-1892 (Clinton J. Warren, architect). *The development of the skeleton frame was pioneered by architects of the "Chicago School" in the late-19th century. With this method the weight of the building is carried on the frame, not the walls, allowing the construction of taller buildings without increasing the wall thickness.*

Recommended

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

Not Recommended

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

Repair

Repairing the structural system by augmenting or upgrading individual parts or features. For example, weakened structural members such as floor framing can be paired with a new member, braced, or otherwise supplemented and reinforced.

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

Not Recommended

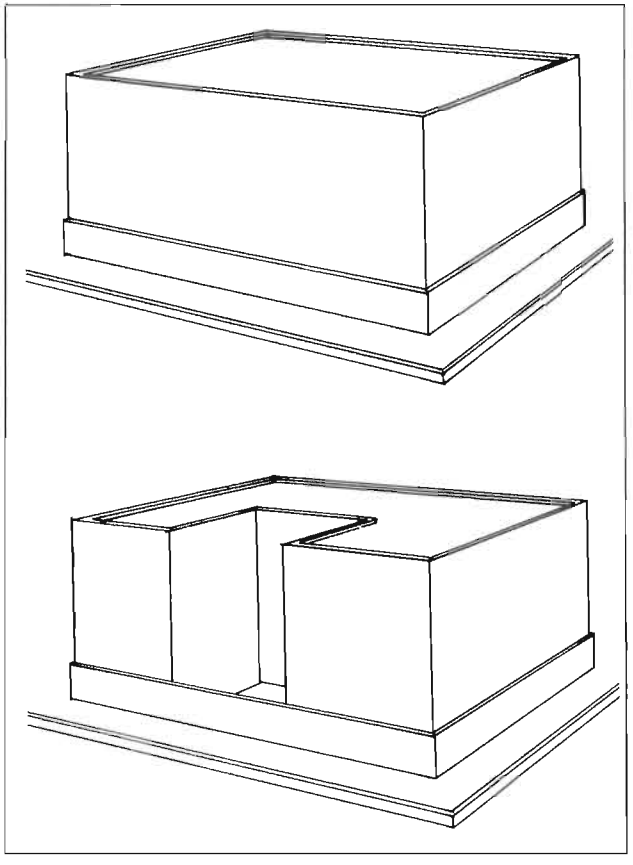
Replace

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, equal its loadbearing capabilities.

Installing a replacement feature that does not convey the same visual appearance, e.g., replacing an exposed wood summer beam with a steel beam.

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

These before and after rehabilitation photographs offer a good example of a project that took into account, and respected, the unique industrial structural character of this mill building in its conversion to a shopping mall.



A rehabilitation proposal to convert a historic waterfront warehouse into a residential apartment building called for cutting out a large section of the rectangular-shaped historic building. The new "U" shape would provide more apartments with a waterfront view. This schematic drawing shows the drastic change that would result to the structure and character of the historic building if a portion had been removed as proposed (the project was denied because it did not meet the Standards).

	Recommended	Not Recommended
The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.	***Alterations/Additions for the New Use***	
	Limiting any new excavations adjacent to historic foundations to avoid undermining the structural stability of the building or adjacent historic buildings. Studies should be done to ascertain potential damage to archeological resources.	Carrying out excavations or regrading adjacent to or within a historic building which could cause the historic foundation to settle, shift, or fail; could have a similar effect on adjacent historic buildings; or could destroy significant archeological resources.
	Correcting structural deficiencies in preparation for the new use in a manner that preserves the structural system and individual character-defining features.	Radically changing interior spaces or damaging or destroying features or finishes that are character-defining while trying to correct structural deficiencies in preparation for the new use.
	Designing and installing new mechanical or electrical systems when required for the new use which minimize the number of cutouts or holes in structural members.	Installing new mechanical and electrical systems or equipment in a manner which results in numerous cuts, splices, or alterations to the structural members.
	Adding a new floor when required for the new use if such an alteration does not damage or destroy the structural system or obscure, damage, or destroy character-defining spaces, features, or finishes.	Inserting a new floor when such a radical change damages a structural system or obscures or destroys interior spaces, features, or finishes. Inserting new floors or furred-down ceilings which cut across the glazed areas of windows so that the exterior form and appearance of the windows are radically changed.
	Creating an atrium or a light well to provide natural light when required for the new use in a manner that assures the preservation of the structural system as well as character-defining interior spaces, features, and finishes.	Damaging the structural system or individual features; or radically changing, damaging, or destroying character-defining interior spaces, features, or finishes in order to create an atrium or a light well.

Building Interior

Spaces, Features and Finishes

Building Interior

Spaces, Features and Finishes

An interior floor plan, the arrangement and sequence of spaces, and built-in features and applied finishes are individually and collectively important in defining the historic character of the building. Their identification, retention, protection, and repair should be given prime consideration in every rehabilitation project. In evaluating historic interiors prior to rehabilitation, it should be kept in mind that interiors are comprised of a series of primary and secondary spaces. This is applicable to all buildings, from courthouses to cathedrals, to cottages and office buildings. Primary spaces, including entrance halls, parlors, or living rooms, assembly rooms and lobbies, are defined not only by their features and finishes, but by the size and proportion of the rooms themselves—purposely created to be the visual attraction or functioning "core" of the building. Care should be taken to retain the essential proportions of primary interior spaces and not to damage, obscure, or destroy distinctive features and finishes.

Secondary spaces include areas and rooms that "service" the primary spaces and may include kitchens, bathrooms, mail rooms, utility spaces, hallways, firestairs and work spaces in a commercial or office building. Extensive changes can often be made in these less important areas without having a detrimental effect on the overall historic character.

Photo: Jack E. Boucher, HABS.

Photo: Jack E. Boucher, HABS.

These photographs suggest the richness and diversity of public building spaces, features, and finishes.

Recommended

Not Recommended

Interior Spaces

Identify, retain and preserve

Identifying, retaining, and preserving a floor plan or interior spaces that are important in defining the overall historic character of the building. 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 use spaces.

Radically changing a floor plan or interior spaces—including individual rooms—which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Altering the floor plan by demolishing principal walls and partitions to create a new appearance.

Altering or destroying interior spaces by inserting floors, cutting through floors, lowering ceilings, or adding or removing walls.

Relocating an interior feature such as a staircase so that the historic relationship between features and space is altered.

Interior Features and Finishes

Identify, retain and preserve

Identifying, retaining, and preserving interior features and finishes that are important in defining the overall historic character of the building, including columns, cornices, baseboards, fireplaces and mantels, panelling, light fixtures, hardware, and flooring; and wallpaper, plaster, paint, and finishes such as stenciling, marbling, and graining; and other decorative materials that accent interior features and provide color, texture, and patterning to walls, floors, and ceilings.

Removing or radically changing features and finishes which are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Installing new decorative material that obscures or damages character-defining interior features or finishes.

Removing paint, plaster, or other finishes from historically finished surfaces to create a new appearance (e.g., removing plaster to expose masonry surfaces such as brick walls or a chimney piece).

Applying paint, plaster, or other finishes to surfaces that have been historically unfinished to create a new appearance.

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

Radically changing the type of finish or its color, such as painting a previously varnished wood feature.

Photo: Jack E. Boucher, HABS.

This historic character of these 19th century residential interiors was protected and maintained during rehabilitation.

Recommended	Not Recommended
Protect and maintain Protecting and maintaining masonry, wood, and architectural metals which comprise interior features through appropriate surface treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coating systems.	Failing to provide adequate protection to materials on a cyclical basis so that deterioration of interior features results.
Protecting interior 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.	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 through vandalism. Stripping interiors of features such as woodwork, doors, windows, light fixtures, copper piping, radiators; or of decorative materials.
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.	Failing to provide proper protection of interior features and finishes during work so that they are gouged, scratched, dented, or otherwise damaged.
Installing protective coverings in areas of heavy pedestrian traffic to protect historic features such as wall coverings, parquet flooring and panelling.	Failing to take new use patterns into consideration so that interior features and finishes are damaged.
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.	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.
Repainting with colors that are appropriate to the historic building.	Using new paint colors that are inappropriate to the historic building.

Recommended

Limiting abrasive cleaning methods to certain industrial or 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.

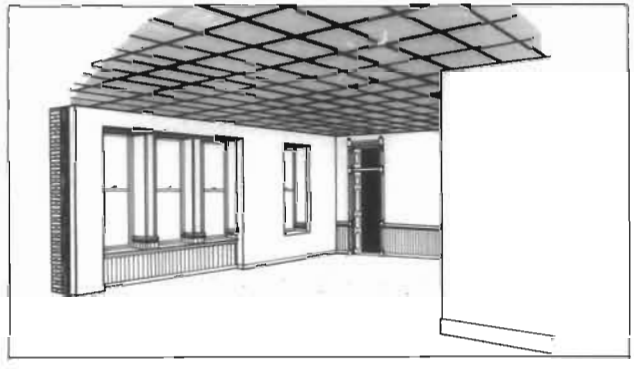
Not Recommended

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

Evaluating the overall 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.

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

Furring out exterior walls to add insulation and suspending new ceilings to hide ductwork and wiring can change a room's proportions and can also destroy or obscure significant decorative detailing.



Repair

Repairing interior features and finishes 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.

Replacing an entire interior feature 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.

Recommended

Replace

Replacing in kind an entire interior feature or finish 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.

Before and after: Prior to rehabilitation of this hotel, water intrusion and freeze-thaw cycles had caused extensive efflorescence and plaster failure. The ornamental plaster was almost fully re-manufactured, then gilded. Light fixtures and other detailing were also carefully replicated.

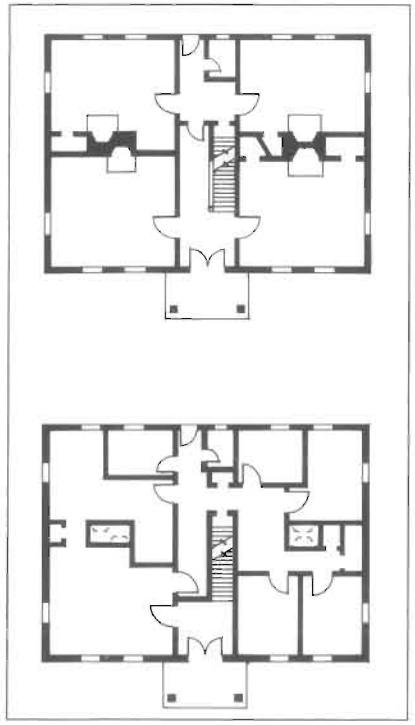
Not Recommended

Removing a character-defining feature or finish that is unrepairable and not replacing it; or replacing it with a new feature or finish that does not convey the same visual appearance.

During rehabilitation, the historic plaster was removed from perimeter walls, leaving the brick exposed; in addition historically painted wood trim was stripped. Removing finishes not only destroys historic materials that should be retained and preserved, but it also gives the interior an appearance it never had historically.

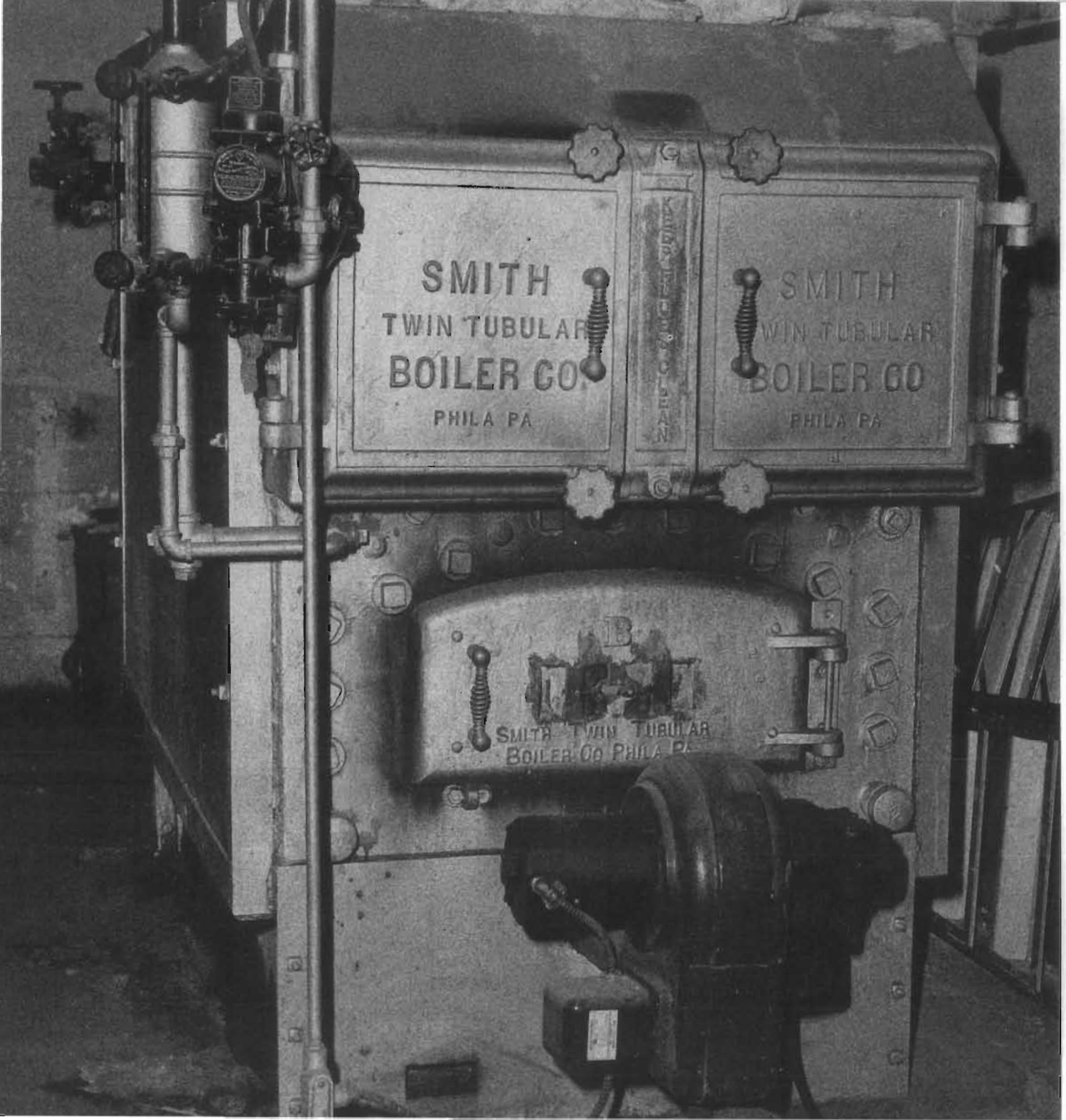
The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Recommended	Not Recommended
Design for Missing Historic Features	
Designing and installing a new interior feature or finish if the historic feature or finish is completely missing. This could include missing partitions, stairs, elevators, lighting fixtures, and wall coverings; or even entire rooms if all historic spaces, features, and finishes are missing or have been destroyed by inappropriate "renovations." The design may be a restoration based on historical, pictorial, and physical documentation; or be a new design that is compatible with the historic character of the building, district, or neighborhood.	Creating a false historical appearance because the replaced feature is based on insufficient physical, historical, and pictorial documentation or on information derived from another building. Introducing a new interior feature or finish that is incompatible with the scale, design, materials, color, and texture of the surviving interior features and finishes.
Alterations/Additions for the New Use	
Accommodating service functions such as bathrooms, mechanical equipment, and office machines required by the building's new use in secondary spaces such as first floor service areas or on upper floors.	Dividing rooms, lowering ceilings, and damaging or obscuring character-defining features such as fireplaces, niches, stairways or alcoves, so that a new use can be accommodated in the building.
Reusing decorative material or features that have had to be removed during the rehabilitation work including wall and baseboard trim, door molding, panelled doors, and simple wainscoting; and relocating such material or features in areas appropriate to their historic placement.	Discarding historic material when it can be reused within the rehabilitation project or relocating it in historically inappropriate areas.
Installing permanent partitions in secondary spaces; removable partitions that do not destroy the sense of space should be installed when the new use requires the subdivision of character-defining interior space.	Installing permanent partitions that damage or obscure character-defining spaces, features, or finishes.



Adding several new rooms to a distinctive interior space may radically change its historic character. Before (top): The original plan was a central hall with four large, equally-sized rooms around it. Each room had a fireplace with a mantel and decorative trim. After (bottom): During rehabilitation, numerous small rooms were added; the open stair was also replaced with a boxed-in stair and the original trim and fireplaces were removed.

Recommended	Not Recommended
Alterations/Additions for the New Use	
Enclosing an interior stairway where required by code so that its character is retained. In many cases, glazed fire-rated walls may be used.	Enclosing an interior stairway with fire-rated construction so that the stairwell space or any character-defining features are destroyed.
Placing new code-required stairways or elevators in secondary and service areas of the historic building.	Radically changing, damaging, or destroying character-defining spaces, features, or finishes when adding new code-required stairways and elevators.
Creating an atrium or a light well to provide natural light when required for the new use in a manner that preserves character-defining interior spaces, features, and finishes as well as the structural system.	Destroying character-defining interior, spaces, features, or finishes; or damaging the structural system in order to create an atrium or light well.
Adding a new floor if required for the new use in a manner that preserves character-defining structural features, and interior spaces, features, and finishes.	Inserting a new floor within a building that alters or destroys the fenestration; radically changes a character-defining interior space; or obscures, damages, or destroys decorative detailing.



Building Interior

Mechanical Systems

HEATING

AIR CONDITIONING

ELECTRICAL

AND PLUMBING

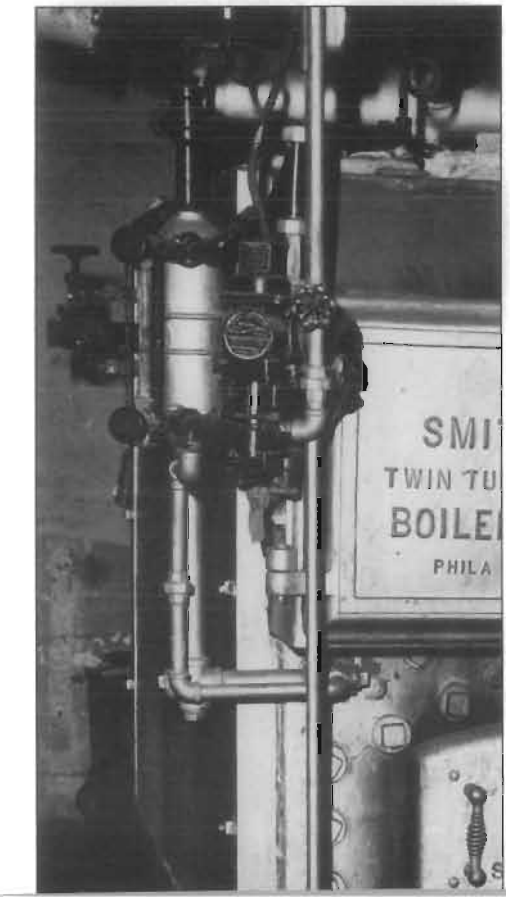
Building Interior

Mechanical Systems

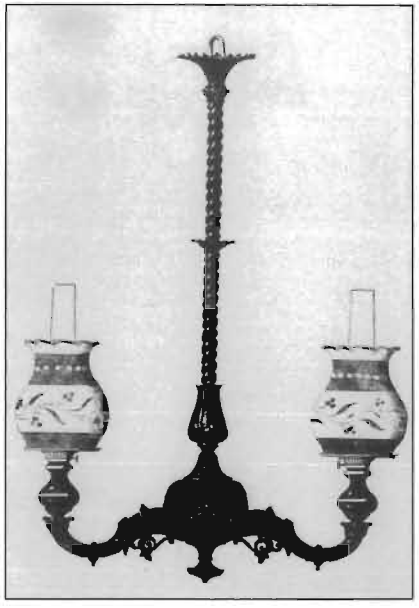
Mechanical, lighting and plumbing systems improved significantly with the coming of the Industrial Revolution. The 19th century interest in hygiene, personal comfort, and the reduction of the spread of disease was met with the development of central heating, piped water, piped gas, and networks of underground cast iron sewers. Vitreous tiles in kitchens, baths and hospitals could be cleaned easily and regularly. The mass production of cast iron radiators made central heating affordable to many; some radiators were elaborate and included special warming chambers for plates or linens. Ornamental grilles and registers provided decorative covers for functional heaters in public spaces. By the turn of the 20th century, it was common to have all of these modern amenities in a building.

The greatest impact of the 20th century on mechanical systems was the use of electricity for interior lighting, forced air ventilation, elevators for tall buildings, exterior lighting and electric heat. The new age of technology brought an increasingly high level of design and decorative art to the functional elements of mechanical, electrical and plumbing systems.

The visible decorative features of historic mechanical systems such as grilles, lighting fixtures, and ornamental switchplates may contribute to the overall historic character of the building and should thus be retained and repaired, whenever possible. Their identification needs to take place together with an evaluation of their physical condition early in project planning. On the other hand, the functioning parts of many older systems, such as compressors and their ductwork, and wiring and pipes may often need to be upgraded or entirely replaced in order to accommodate the new use and to meet code requirements.



The visible features of historic mechanical systems, such as heating, lighting, and plumbing, may sometimes help define the overall character of an interior.



A gaslight may be converted for electrical use to extend its functional and decorative life.

Recommended	Not Recommended
Identify, retain and preserve	
Identifying, retaining, and preserving visible features of early mechanical systems that are important in defining the overall historic character of the building, such as radiators, vents, fans, grilles, plumbing fixtures, switchplates, and lights.	Removing or radically changing features of mechanical systems that are important in defining the overall historic character of the building so that, as a result, the character is diminished.

Photo: Brooks Photographers, HABS Collection.

The bronze elevator doors and light coffers play an important decorative role in this early-20th century administrative building.

Protect and maintain	
Protecting and maintaining mechanical, plumbing, and electrical systems and their features through cyclical cleaning and other appropriate measures.	Failing to provide adequate protection of materials on a cyclical basis so that deterioration of mechanical systems and their visible features results.
Preventing accelerated deterioration of mechanical systems by providing adequate ventilation of attics, crawlspaces, and cellars so that moisture problems are avoided.	Enclosing mechanical systems in areas that are not adequately ventilated so that deterioration of the systems results.

Photo: Richard Nickel

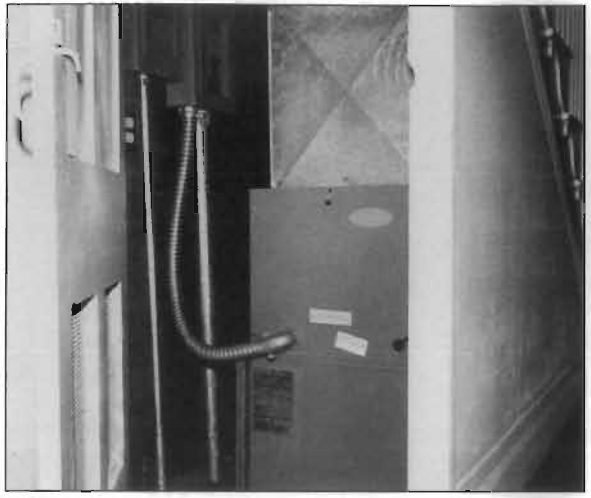
Both function and design elegance are evident in this row of cast iron elevator cages and light fixtures adorning an early-20th century commercial building.

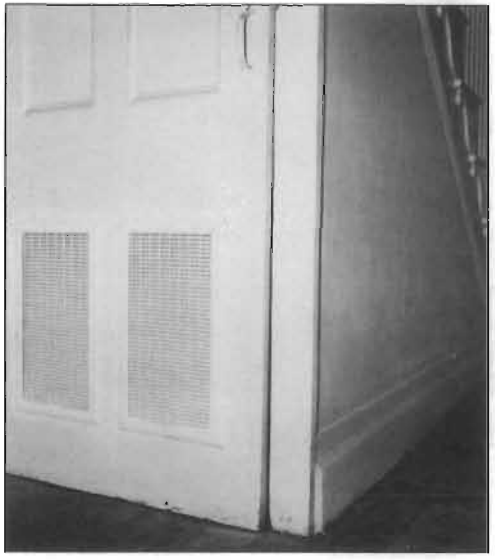
Recommended	Not Recommended
Improving the energy efficiency of existing mechanical systems to help reduce the need for elaborate new equipment. Consideration should be given to installing storm windows, insulating attic crawl space, or adding awnings, if appropriate.	Installing unnecessary air conditioning 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.

Repair

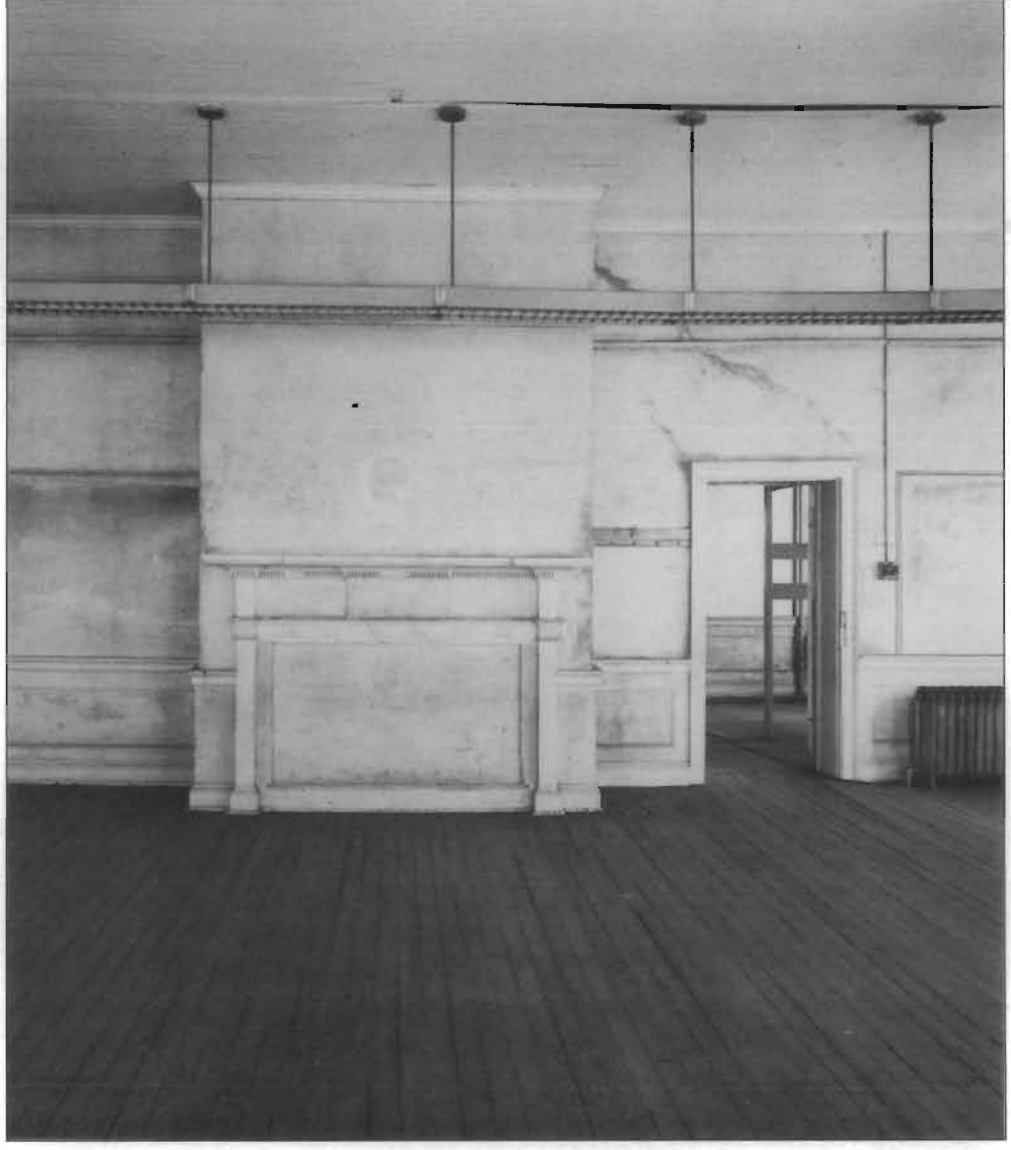
Repairing mechanical systems by augmenting or upgrading system parts, such as installing new pipes and ducts; rewiring; or adding new compressors or boilers.	Replacing a mechanical system or its functional parts when it could be upgraded and retained.

The historic window on a primary facade has been shortened and the area below it filled in with brick in order to install a through-the-wall air conditioning unit. In addition to changing the window size and destroying the sill, the unit itself is visually obtrusive.





When a late-19th century single-family house was converted to four rental units, the new HVAC system was installed under the central stair. When the door is closed, only the vents indicate its presence.



This row of hanging fluorescent lights installed in an earlier renovation mars an otherwise classically detailed interior. They have also caused the historic beaded ceiling to pull away from the joists.

Recommended

Replace

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

Not Recommended

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

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns listed above have been addressed.

Recommended	Not Recommended
Alterations/Additions for the New Use	
Installing a completely new mechanical system if required for the new use so that it causes the least alteration possible to the building's floor plan, the exterior elevations, and the least damage to the historic building material.	Installing a new mechanical system so that character-defining structural or interior features are radically changed, damaged, or destroyed.
Providing adequate structural support for new mechanical equipment.	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 the vertical runs of ducts, pipes, and cables in closets, service rooms, and wall cavities.	Installing vertical runs of ducts, pipes, and cables in places where they will obscure character-defining features.
	Concealing mechanical equipment in walls or ceilings in a manner that requires the removal of historic building material.
	Installing "dropped" acoustical ceiling to hide mechanical equipment when this destroys the proportions of character-defining interior spaces.
Installing air conditioning units if required by the new use in such a manner that historic features are not damaged or obscured and excessive moisture is not generated that will accelerate deterioration of historic materials.	Cutting through features such as masonry walls in order to install air conditioning units.
Installing heating/air conditioning units in the window frames in such a manner that the sash and frames are protected. Window installations should be considered only when all other viable heating/cooling systems would result in significant damage to historic materials.	Radically changing the appearance of the historic building or damaging or destroying windows by installing heating/air conditioning units in historic window frames.

Building Site

Building Site

The landscape surrounding a historic building and contained within an individual parcel of land is considered the building site. The site, including its associated features, contributes to the overall character of the historic property. As a result, the relationship between the buildings and landscape features within the site's boundaries should be considered in the overall planning for rehabilitation project work.

Landscapes which contain historic buildings are found in rural, suburban, and urban communities and reflect environmental influences such as climate as well as the historic period in which they were created. Landscapes created for functional purposes as well as aesthetic enjoyment have been a part of American history since European settlement. Historic American styles in landscape design developed from 17th-18th century Spanish and Colonial gardens, evolving into the pastoral and picturesque design of the 19th century. Victorian carpet bedding, popular during the late 19th century, produced profuse plantings of annuals and perennials. Later, the early 20th century yielded a return to classical traditions, with revival gardens reflecting European renaissance design.

The building site may be significant in its own right, or derive its significance simply from its association with the historic structure. The level of significance, association, integrity, and condition of the building site may influence the degree to which the existing landscape features should be retained during the rehabilitation project. In an industrial property, the site may be defined simply as the relationship between buildings or between the ground plane and open space and its associated buildings. Designed historic landscapes significant in the field of landscape architecture require a more detailed analysis of their character-defining features which may include lawns, hedges, walks, drives, fences, walls, terraces, water features, topography (grading) and furnishings. Vegetation is an important feature in landscapes; this material, including both native species and cultivated plants, creates an appearance that is constantly changing, both seasonally and annually. Since most plant material is adapted to specific environments, the character of landscapes varies dramatically in different climates, elevations and regions.

Recommended

Identify, retain and preserve

Identifying, retaining, and preserving buildings and their features as well as features of the site that are important in defining its overall historic character. 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 history of the site.

Retaining the historic relationship between buildings and the landscape.

The stream and circular wagon approach are important features of this historic mill site.

Not Recommended

Removing or radically changing buildings and their features or site features which are important in defining the overall historic character of the property so that, as a result, the character is diminished.

Photo: Courtesy, Whitman County Historical Society, Inc., Pullman, Washington.

Landscape features that are important in defining the historic character of a building site may include fences, walks, and small outbuildings, as well as trees, bushes and topography that may be unique, such as the hill behind the house.

Removing or relocating buildings or landscape features thus destroying the historic relationship between buildings and the landscape.

Removing or relocating historic buildings on a site or in a complex of related historic structures—such as a mill complex or farm—thus diminishing its historic character.

Moving buildings onto the site, thus creating a false historical appearance.

Radically changing the grade level of the site. For example, changing the grade adjacent to a building to permit development of a formerly below-grade area that would drastically change the historic relationship of the building to its site.

Recommended	Not Recommended
Providing proper drainage to assure that water does not erode foundation walls; drain toward the building; or damage or erode the landscape.	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.
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.	Introducing heavy machinery into areas where it may disturb or damage important landscape features or archeological resources.
Surveying and documenting areas where the terrain will be altered to determine the potential impact to important landscape features or archeological resources.	Failing to survey the building site prior to the beginning of rehabilitation work which results in damage to, or destruction of, important landscape features or archeological resources.

Whenever possible, non-destructive techniques should be used to inventory and evaluate archeological resources to ensure their protection.

Recommended	Not Recommended
Protect and maintain	
Protecting, e.g., preserving in place important archeological resources.	Leaving known archeological material unprotected so that it is damaged during rehabilitation work.
Planning and carrying out any necessary investigation using professional archeologists and modern archeological methods when preservation in place is not feasible.	Permitting unqualified personnel to perform data recovery on archeological resources so that improper methodology results in the loss of important archeological material.
Preserving important landscape features, including ongoing maintenance of historic plant material.	Allowing important landscape features to be lost or damaged due to a lack of maintenance.
Protecting building and landscape features against arson and vandalism before rehabilitation work begins, i.e., erecting protective fencing and installing alarm systems that are keyed into local protection agencies.	Permitting the property to remain unprotected so that the building and landscape features or archeological resources are damaged or destroyed. Removing or destroying features from the building or site such as wood siding, iron fencing, masonry balustrades, or plant material.

▲ ▶ *The roof and stained glass windows of this historic church have been appropriately covered with plywood as a protective measure during construction of a new building on an adjacent lot.*

Recommended	Not Recommended
Providing continued protection of masonry, wood, and architectural metals which comprise the building and site features through appropriate cleaning, rust removal, limited paint removal, and re-application of protective coating systems.	Failing to provide adequate protection of materials on a cyclical basis so that deterioration of building and site features results.
Evaluating the overall 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.	Failing to undertake adequate measures to assure the protection of building and site features.

Repair

Repairing features of the building and site by reinforcing historic materials.	Replacing an entire 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.

Park-like settings surrounding many historic mansions are important in defining their historic character. However, the relationship between building and site was destroyed by an inappropriate rehabilitation when this house was converted into offices, and the formally landscaped grounds in front of the house were bulldozed to provide a parking lot.

Recommended

Not Recommended

Replace

Replacing in kind an entire 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.

Removing a feature of the building or site that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Replacing deteriorated or damaged landscape features in kind.

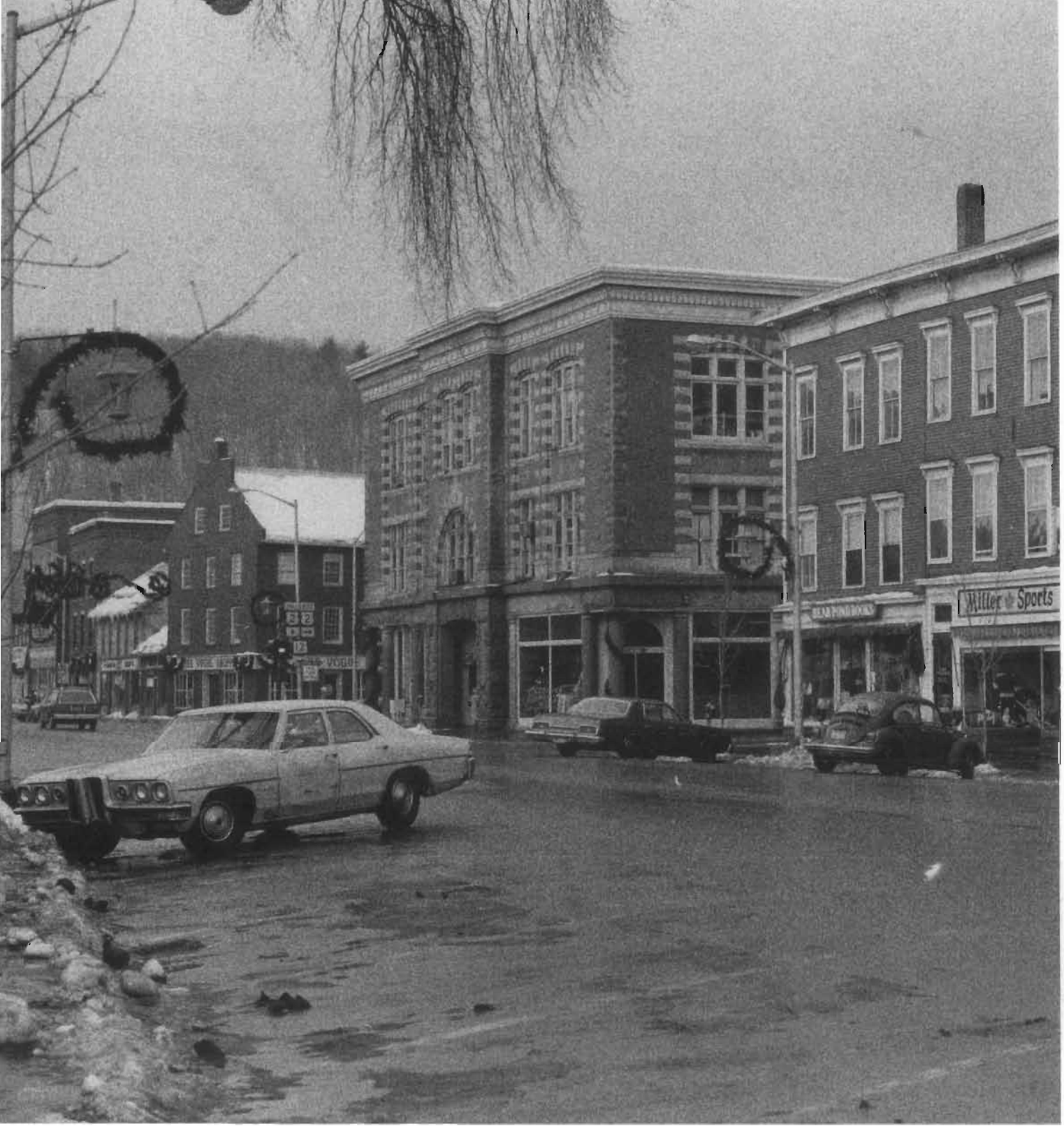
Adding conjectural landscape features to the site such as period reproduction lamps, fences, fountains, or vegetation that is historically inappropriate, thus creating a false sense of historic development.

Photo: Library, The State Historical Society of Colorado

This wood picket fence is as important to the site as the shutters, porch detailing, and clapboards are to the house. As such, the fence was carefully repaired and painted as part of an overall project to preserve the historic residence.

The following work is highlighted to indicate that it represents the particularly complex technical or design aspects of rehabilitation project work and should only be considered after the preservation concerns listed above have been addressed.

Recommended	Not Recommended
Design for Missing Historic Features	
Designing and constructing a new feature of a building or site when the historic feature is completely missing, such as an outbuilding, terrace or driveway. It may be based on historical, pictorial, and physical documentation; or be a new design that is compatible with the historic character of the building and site.	Creating a false historical appearance because the replaced feature is based on insufficient historical, pictorial, and physical documentation. Introducing a new building or site feature that is out of scale or of an otherwise inappropriate design. Introducing a new landscape feature, including plant material, that is visually incompatible with the site, or that alters or destroys the historic site patterns or vistas.
Alterations/Additions for the New Use	
Designing new onsite parking, loading docks, or ramps when required by the new use so that they are as unobtrusive as possible and assure the preservation of the historic relationship between the building or buildings and the landscape.	Locating any new construction on the building where important landscape features will be damaged or destroyed, for example removing a lawn and walkway and installing a parking lot.
Designing new exterior additions to historic buildings or adjacent new construction which is compatible with the historic character of the site and which preserves the historic relationship between the building or buildings and the landscape.	Placing parking facilities directly adjacent to historic buildings where automobiles may cause damage to the buildings or to important landscape features. Introducing new construction onto the building site which is visually incompatible in terms of size, scale, design, materials, color, and texture; which destroys historic relationships on the site; or which damages or destroys important landscape features.
Removing nonsignificant buildings, additions, or site features which detract from the historic character of the site.	Removing a historic building in a complex of buildings; or removing a building feature, or a landscape feature which is important in defining the historic character of the site.



Setting

District or Neighborhood

Setting

District or Neighborhood

The setting is the area or environment in which a historic property is found. It may be an urban or suburban neighborhood or a natural landscape in which a building has been constructed. The elements of setting, such as the relationship of buildings to each other, setbacks, fence patterns, views, driveways and walkways, and street trees together create the character of a district or neighborhood. In some instances, many individual building sites may form a neighborhood or setting. In rural environments, agricultural or natural landscapes may form the setting for an individual property.

In an urban historic district, the alignment and width of roads, the relationship between buildings and yards, and the repetition of trees lining the streets help define its historic character.

Photo: Agency of Development and Community Affairs, Montpelier, Vermont.

The setting is an important aspect of a historic district. In a rural historic district, the natural topography and landscape features, agricultural field patterns, roads, and the organization of buildings and structures all contribute to its character.

Recommended	Not Recommended
Identify, retain and preserve	
Identifying, retaining, and preserving building and landscape features which are important in defining the historic character 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.	Removing or radically changing those features of the setting which are important in defining the historic character.
Retaining the historic relationship between buildings and landscape features of the setting. For example, preserving the relationship between a town common and its adjacent historic houses, municipal buildings, historic roads, and landscape features.	Destroying the relationship between the buildings and landscape features within the setting by widening existing streets, changing landscape materials or constructing inappropriately located new streets or parking. Removing or relocating historic buildings or landscape features, thus destroying their historic relationship within the setting.
Protect and maintain	
Protecting and maintaining historic building materials and plant features through appropriate treatments such as cleaning, rust removal, limited paint removal, and reapplication of protective coating systems; and pruning and vegetation management.	Failing to provide adequate protection of materials on a cyclical basis which results in the deterioration of building and landscape features.
Protecting buildings and landscape features against arson and vandalism before rehabilitation work begins by erecting protective fencing and installing alarm systems that are keyed into local protection agencies.	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.

Recommended

Evaluating the overall 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.

Street furniture such as this historic clock helps define an urban district's character and thus should be retained in a rehabilitation.

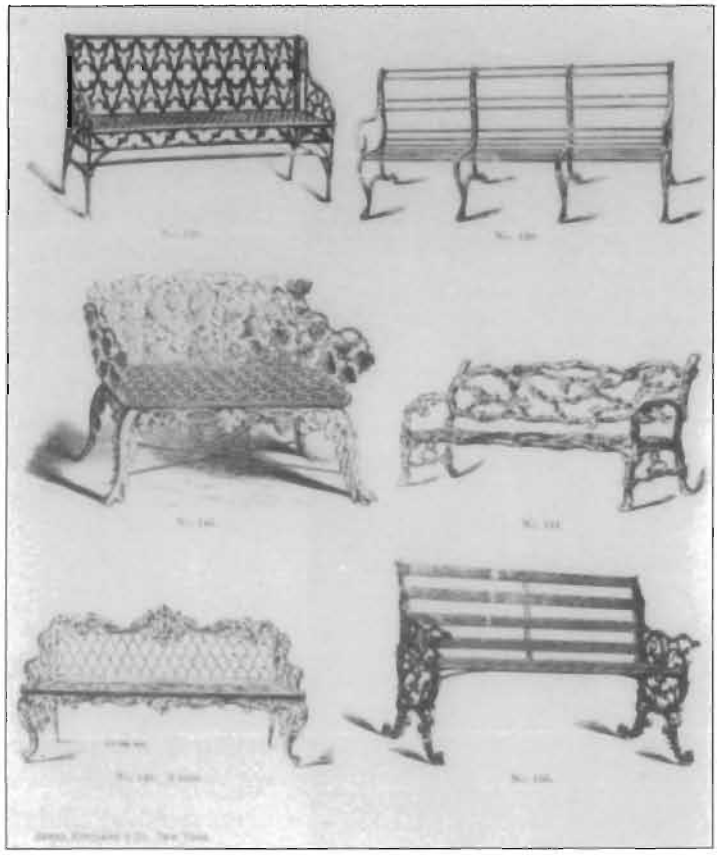
Photo: Jack E. Boucher, HABS.

Repair

Repairing features of the building and landscape by reinforcing the historic materials. Repair will also generally include the replacement in kind—or with a compatible substitute materia—of those extensively deteriorated or missing parts of features where there are surviving prototypes such as porch balustrades or paving materials.

Not Recommended

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



Cast Iron Benches, Illustrated Catalogue of Ornamental Iron Works, Janes, Kirtland & Co., 1870. *Benches can be important features both in defining an urban streetscape as well as a more rural landscape.*

Replacing an entire feature of the building or landscape 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.

This late-19th century residential historic district is characterized by brick row-houses with two-storied bays. A street-scape's visual continuity can be marred by an insensitive rehabilitation such as the one shown here. The original two-story brick bay of one of the houses was removed and replaced with a three-story bay that is incompatible in size, materials, and detailing.

Recommended

Not Recommended

Replace

Replacing in kind an entire 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.

Removing a feature of the building or landscape that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

The following work is highlighted because it represents the particularly complex technical or design aspects of rehabilitation projects and should only be considered after the preservation concerns above have been addressed.

Recommended	Not Recommended
Design for Missing Historic Features	
Designing and constructing a new feature of the building or landscape when the historic feature is completely missing, such as rowhouse steps, a porch, a streetlight, or terrace. It may be a restoration based on documentary or physical evidence; or be a new design that is compatible with the historic character of the setting.	Creating a false historical appearance because the replaced feature is based on insufficient documentary or physical evidence. Introducing a new building or landscape feature that is out of scale or otherwise inappropriate to the setting's historic character, e.g., replacing picket fencing with chain link fencing.
Alterations/Additions for the New Use	
Designing required new parking so that it is as unobtrusive as possible, thus minimizing the effect on the historic character of the setting. "Shared" parking should also be planned so that several businesses can utilize one parking area as opposed to introducing random, multiple lots.	Placing parking facilities directly adjacent to historic buildings which cause damage to historic landscape features, including removal of plant material, relocation of paths and walkways, or blocking of alleys.
Designing and constructing new additions to historic buildings when required by the new use. New work should be compatible with the historic character of the setting in terms of size, scale, design, material, color, and texture.	Introducing new construction into historic districts that is visually incompatible or that destroys historic relationships within the setting.
Removing nonsignificant buildings, additions or landscape features which detract from the historic character of the setting.	Removing a historic building, building feature, or landscape feature that is important in defining the historic character of the setting.

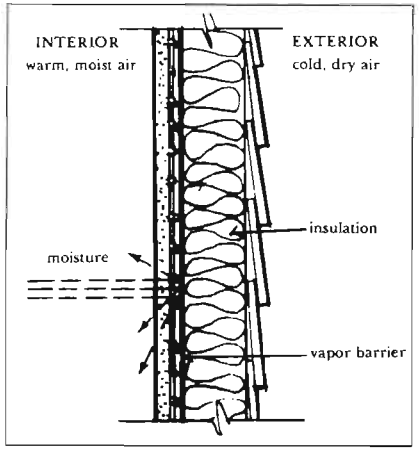
Although the work in the following sections is quite often an important aspect of rehabilitation projects, it is usually *not* part of the overall process of preserving character-defining features (maintenance, repair, replacement); rather, such work is assessed for its potential negative impact on the building's historic character. For this reason, particular care must be taken not to obscure, radically change, damage, or destroy character-defining features in the process of rehabilitation work.

Energy Conservation

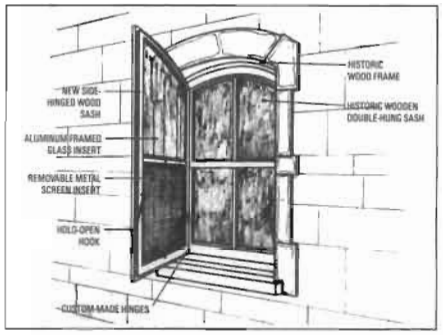
Energy Conservation

Some character-defining features of a historic building or site such as cupolas, shutters, transoms, skylights, sun rooms, porches, and plantings also play a secondary, energy-conserving role. Therefore, prior to retrofitting historic buildings to make them more energy efficient, the first step should always be to identify and evaluate the existing historic features to assess their inherent energy-conserving potential. If it is determined that retrofitting measures are necessary, then such work needs to be carried out with particular care to insure that the building's historic character is preserved in the process of rehabilitation.

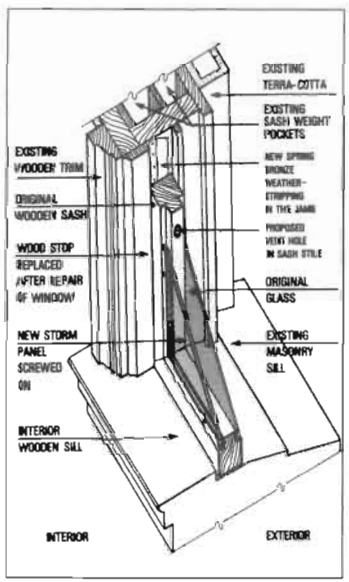
Recommended	Not Recommended
District/Neighborhood	
Maintaining those existing landscape features which moderate the effects of the climate on the setting such as deciduous trees, evergreen windblocks, and lakes or ponds.	Stripping the setting of landscape features and landforms so that the effects of the wind, rain, and the sun results in accelerated deterioration of historic materials.
Building Site	
Retaining plant materials, trees, and landscape features, especially those which perform passive solar energy functions such as sun shading and wind breaks.	Removing plant materials, trees, and landscape features, so that they no longer perform passive solar energy functions.
Installing freestanding solar collectors in a manner that preserves the historic property's character-defining features.	Installing freestanding solar collectors that obscure, damage, or destroy historic landscape or archeological features.
Designing attached solar collectors, including solar greenhouses, so that the character-defining features of the property are preserved.	Locating solar collectors where they radically change the property's appearance; or damage or destroy character-defining features.
Masonry/Wood/Architectural Metals	
Installing thermal insulation in attics and in unheated cellars and crawlspaces to increase the efficiency of the existing mechanical systems.	Applying thermal insulation with a high moisture content into wall cavities in an attempt to reduce energy consumption.
Installing insulating material on the inside of masonry walls to increase energy efficiency where there is no character-defining interior molding around the window or other interior architectural detailing.	Resurfacing historic building materials with more energy efficient but incompatible materials, such as covering historic masonry with exterior insulation.



When installing insulation in the wall cavity of a historic wood-frame building, a vapor barrier must be placed facing-in toward the heated side of the wall. The vapor barrier prevents moisture from passing from the warm interior to the cold exterior, thus keeping the insulation and adjacent building materials dry.



Historic residential window—*appropriate storm window retrofit. The single casement, wooden storm window has two removable panels for screen and glass inserts. It is designed to minimize visual changes to the historic building.*

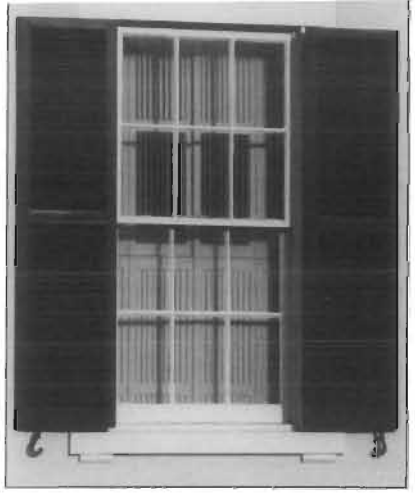


Historic commercial window—*appropriate storm window retrofit. This cutaway view shows how the historic sash would receive a recessed storm panel through routing or cutting an inside rabbet.*

Recommended	Not Recommended
Installing passive solar devices such as a glazed "trombe" wall on a rear or inconspicuous side of the historic building.	Installing passive solar devices such an attached glazed "trombe" wall on primary or other highly visible elevations; or where historic material must be removed or obscured.
Roofs	
Placing solar collectors on non-character-defining roofs or roofs of nonhistoric adjacent buildings.	Placing solar collectors on roofs when such collectors change the historic roofline or obscure the relationship of the roof features such as dormers, skylights, and chimneys.
Windows	
Utilizing the inherent energy conserving features of a building by maintaining windows and louvered blinds in good operable condition for natural ventilation.	Removing historic shading devices rather than keeping them in an operable condition.
Improving thermal efficiency with weatherstripping, storm windows, caulking, interior shades, and if historically appropriate, blinds and awnings.	Replacing historic multi-paned sash with new thermal sash utilizing false muntins.
Installing interior storm windows with air-tight gaskets, ventilating holes, and/or removable clips to insure proper maintenance and to avoid condensation damage to historic windows.	Installing interior storm windows that allow moisture to accumulate and damage the window.
Installing exterior storm windows which do not damage or obscure the windows and frames.	Installing new exterior storm windows which are inappropriate in size or color. Replacing windows or transoms with fixed thermal glazing or permitting windows and transoms to remain inoperable rather than utilizing them for their energy conserving potential.

Recommended	Not Recommended
Considering the use of lightly tinted glazing on non-character-defining elevations if other energy retrofitting alternatives are not possible.	Using tinted or reflective glazing on character-defining or other conspicuous elevations.
Entrances and Porches	
Utilizing the inherent energy conserving features of a building by maintaining porches and double vestibule entrances in good condition so that they can retain heat or block the sun and provide natural ventilation.	Enclosing porches located on character-defining elevations to create passive solar collectors or airlock vestibules. Such enclosures can destroy the historic appearance of the building.

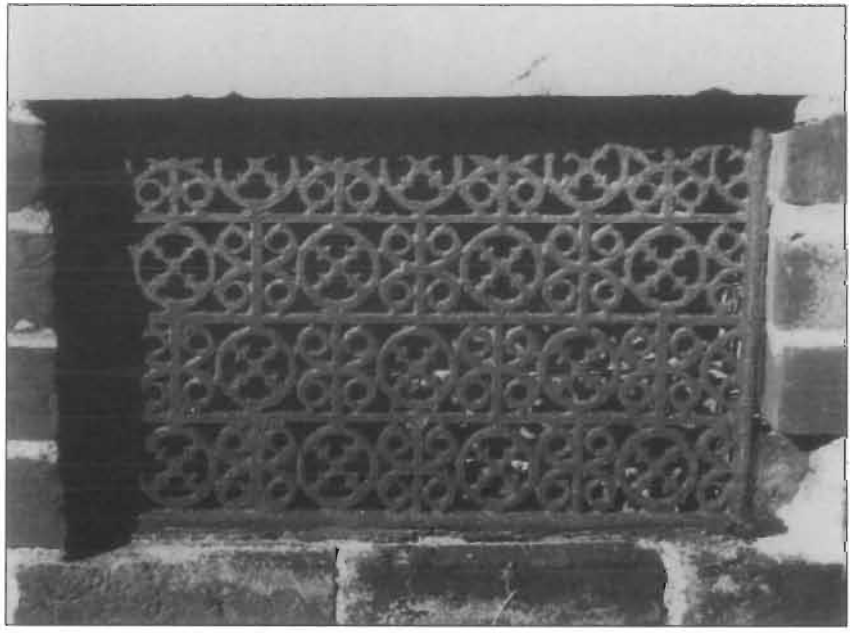
In hot climates, buildings were historically designed to minimize the heat gain from the summer sun. The wide roof overhangs, exterior porches, shutters, shade trees, and heavy masonry walls (painted white) are all energy saving characteristics.



Shutters were used to minimize temperature extremes. If interior or exterior shutters are present, they should be retained, preserved, and used as they were historically.

Recommended	Not Recommended
Interior Features	
Retaining historic interior shutters and transoms for their inherent energy conserving features.	Removing historic interior features which play a secondary energy conserving role.
New Additions to Historic Buildings	
Placing new additions that have an energy conserving function such as a solar greenhouse on non-character-defining elevations.	Installing new additions such as multi-story solar greenhouse additions which obscure, damage, or destroy character-defining features.
Mechanical Systems	
Improving energy efficiency of existing mechanical systems by installing insulation in attics and basements.	Replacing existing mechanical systems that could be repaired for continued use.

This decorative cast-iron vent serves a useful passive energy conservation function by allowing air to circulate at basement level.



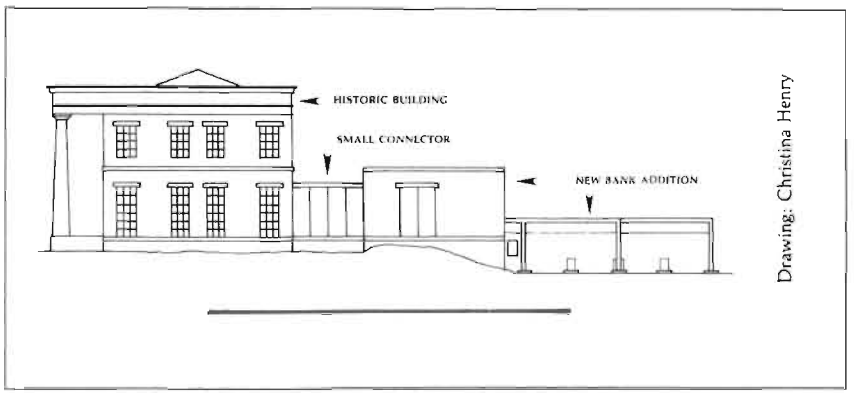
New Additions to Historic Buildings

New Additions to Historic Buildings

An attached exterior addition to a historic building expands its "outer limits" to create a new profile. Because such expansion has the capability to radically change the historic appearance, an exterior addition should be considered only after it has been determined that the new use cannot be successfully met by altering non-character-defining interior spaces. If the new use cannot be met in this way, then an attached exterior addition is usually an acceptable alternative. New additions should be designed and constructed so that the character-defining features of the historic building are not radically changed, obscured, damaged, or destroyed in the process of rehabilitation. New design should always be clearly differentiated so that the addition does not appear to be part of the historic resource.

An 1847 residence was successfully converted into a bank, with the construction of a low-scale addition. The drawing shows how the three-unit addition has been stepped down the hill, each unit set further back from the historic structure as it extends horizontally. As a result, the new addition is only partially visible from the historic "approach." The small connector was sensitively designed to minimize loss of historic building materials.

Recommended	Not Recommended
Placing functions and services required for the new use in non-character-defining interior spaces rather than constructing a new addition.	Expanding the size of the historic building by constructing a new addition when the new use could be met by altering non-character-defining interior spaces.
Constructing a new addition so that there is the least possible loss of historic materials and so that character-defining features are not obscured, damaged, or destroyed.	Attaching a new addition so that the character-defining features of the historic building are obscured, damaged, or destroyed.
Locating the attached exterior addition at the rear or on an inconspicuous side of a historic building; and limiting its size and scale in relationship to the historic building.	Designing a new addition so that its size and scale in relation to the historic building are out of proportion, thus diminishing the historic character.
Designing new additions in a manner that makes clear what is historic and what is new.	Duplicating the exact form, material, style, and detailing of the historic building in the new addition so that the new work appears to be part of the historic building. Imitating a historic style or period of architecture in new additions, especially for contemporary uses such as drive-in banks or garages.



A new 10-story wing added to the back of a historic library constitutes major expansion, yet is compatible because it reads as a subsidiary unit to the much larger historic building.

Left:This rooftop addition has substantially altered the historic profile and proportions of a three-story row house; more important, it has interrupted the uniform roof height of the block. The greenhouse is also a jarring element in an otherwise intact 19th century streetscape. Below: A sizeable employee lounge was added atop this four-story historic commercial building. Because the rooftop addition has been set back from both the front and side roof edges against a party wall, the historic character of the building and the district have been preserved.

Recommended

Considering the attached exterior addition both in terms of the new use and the appearance of other buildings in the historic district or neighborhood. Design for the new work may be contemporary or may reference design motifs from the historic building. In either case, it should always be clearly differentiated from the historic building and be compatible in terms of mass, materials, relationship of solids to voids, and color.

Not Recommended

Designing and constructing new additions that result in the diminution or loss of the historic character of the resource, including its design, materials, workmanship, location, or setting.

Using the same wall plane, roof line, cornice height, materials, siding lap or window type to make additions appear to be a part of the historic building.

The historic residence is on the right. By copying the decorative gable and three-part window in the new addition, the old and new portions are virtually indistinguishable. This approach violates the Standards for Rehabilitation.

Recommended

Placing new additions such as balconies and greenhouses on non-character-defining elevations and limiting the size and scale in relationship to the historic building.

Designing additional stories, when required for the new use, that are set back from the wall plane and are as inconspicuous as possible when viewed from the street.

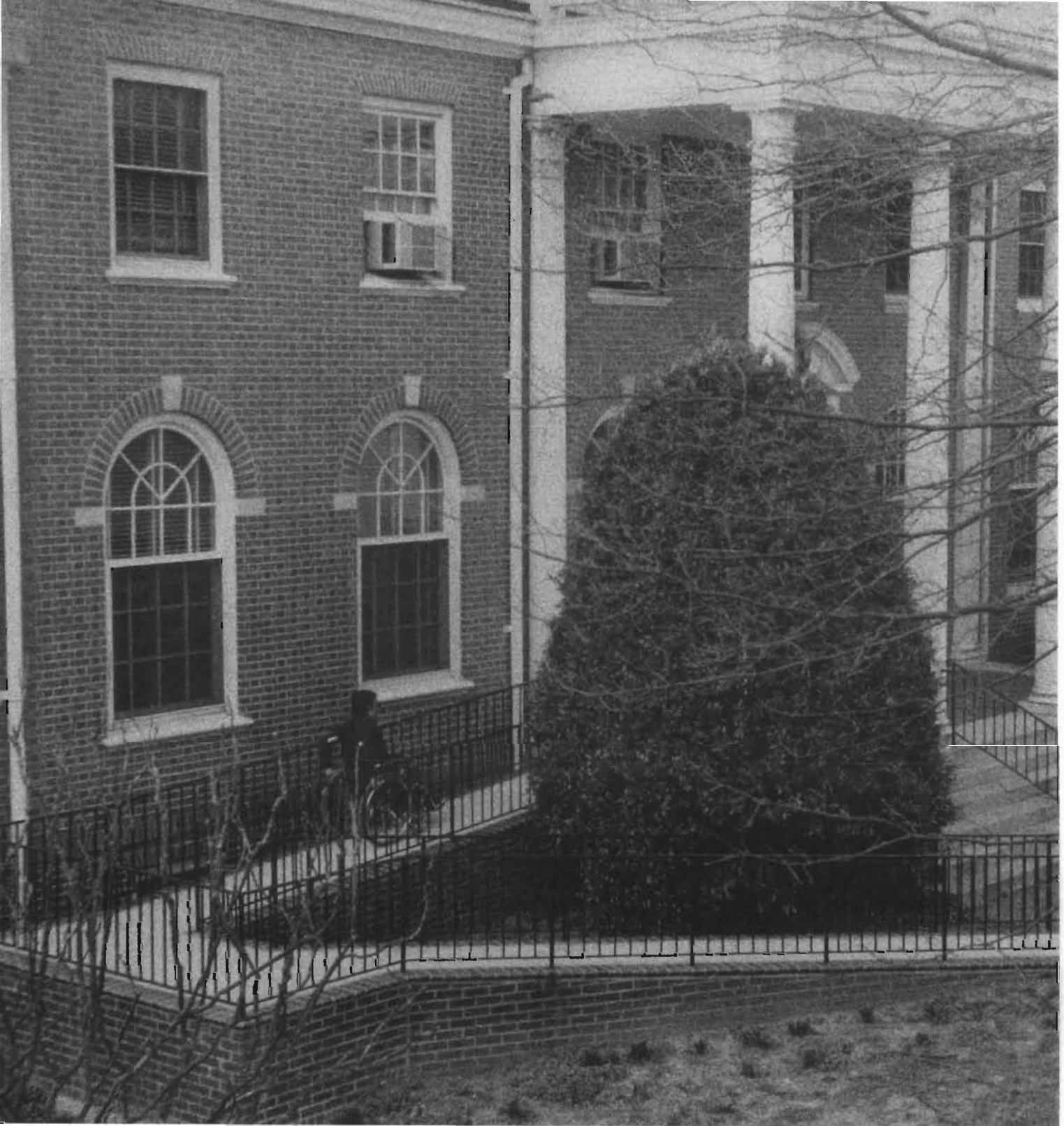
In rehabilitating a historic bank for a new use, a small restaurant addition was built on the rear. The new addition is compatible with the historic building primarily because of its scale and location.

Not Recommended

Designing new additions such as multi-story greenhouse additions that obscure, damage, or destroy character-defining features of the historic building.

Constructing additional stories so that the historic appearance of the building is radically changed.

Two small Victorian cottages, above, were connected to provide additional floor space in a commercial rehabilitation. The inappropriate infill connector, below, is on the same plane as the historic facades, essentially making the two cottages appear as one building. If the new infill had been substantially set back from the facade, the distinct form of each cottage would have been retained.



Accessibility Considerations

Accessibility Considerations

It is often necessary to make modifications to a historic property so that it can comply with current accessibility code requirements. Accessibility to certain historic buildings and sites is required by three specific federal laws: the Architectural Barriers Act of 1968, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990. Federal rules, regulations, and standards have been developed which provide guidance on how to accomplish access in historic areas. The question is not *if* access should be provided; the question is *how* to provide it to meet both accessibility *and* historic preservation requirements. Thus, work must be carefully planned and undertaken so that it does not result in a loss of character-defining spaces, features, and finishes. The goal is to provide the highest level of access with the lowest level of impact.

Recommended	Not Recommended
Identifying the historic building's character defining spaces, features, and finishes so that accessibility code-required work will not result in their damage or loss.	Undertaking code-required alterations before identifying those spaces, features or finishes which are character-defining and must therefore be preserved.
Complying with barrier-free access requirements, in such a manner that character-defining spaces, features, and finishes are preserved.	Altering, damaging, or destroying character-defining features in attempting to comply with accessibility requirements.

The historic cast iron railing was preserved when a permanent ramp was designed for this museum's main entrance.

Access to this rural historic site has been improved to include designated parking areas, properly graded ramps and walkways around the site, and access within the building to all services.

Photo: Cuyahoga Valley National Recreation Area, NPS.

An accordion-type platform lift that retracts to ground level when not in use has been installed to make this historic house accessible.

Recommended

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 the disabled person to the highest degree practicable, while preserving significant historic features.

Designing new or additional means of access that are compatible with the historic property and its setting.

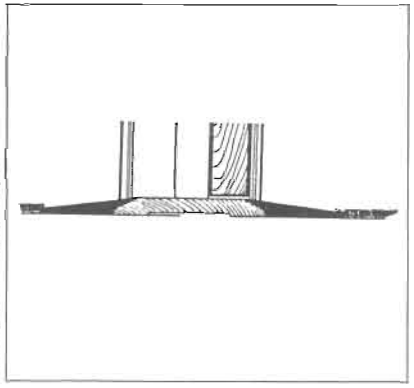
Not Recommended

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

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

Designing new or additional means of access without considering the impact on the historic property and its setting.

A relatively simple way to increase accessibility inside a historic building may be to add bevels to the sides of a threshold.



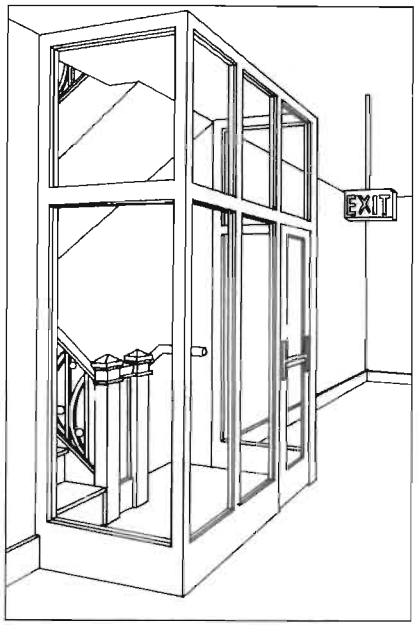
Drawing: Duncan S. Ballantyne.

Health and Safety Considerations

Health and Safety Considerations

In undertaking rehabilitation work on historic buildings, it is necessary to consider the impact that meeting current health and safety codes (public health, occupational health, life safety, fire safety, electrical, structural and building codes) will have on character-defining spaces, features, and finishes. Special coordination with the responsible code officials at the state, county or municipal level may be required. Securing required building permits and occupancy licenses is best accomplished early in rehabilitation planning.

In the area of occupational health, research on older, more commonly used building materials (insulation, floor and wall coverings and lead paints) indicates that the presence of toxic substances in them is potentially hazardous to building occupants. Following careful investigation and analysis, some form of abatement may be required such as encapsulation, or partial or total removal. All workers involved in the encapsulation, repair, or removal of known toxic materials should be adequately trained and should wear proper personal protective equipment. Finally, preventive and routine maintenance programs for historic structures known to contain such materials should also be developed to include proper warnings and precautions.



Existing decorative staircases in historic buildings may meet safety requirements if enclosed with safety glass. This enclosure preserves the stairs while providing a secure means of egress.

Recommended	Not Recommended
Identifying the historic building's character-defining spaces, features, and finishes so that code-required work will not result in their damage or loss.	Undertaking code-required alterations to a building or site before identifying those spaces, features, or finishes which are character-defining and must therefore be preserved.
Complying with health and safety codes, including seismic code requirements, in such a manner that character-defining spaces, features, and finishes are preserved.	Altering, damaging, or destroying character-defining spaces, features, and finishes while making modifications to a building or site to comply with safety codes.
Removing toxic building materials only after thorough testing has been conducted and only after less invasive abatement methods have been shown to be inadequate.	Destroying historic interior features and finishes without careful testing and without considering less invasive abatement methods.
Providing workers with appropriate personal protective equipment for hazards found in the worksite.	Removing unhealthful building materials without regard to personal and environmental safety.
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.	Making changes to historic buildings without first exploring equivalent health and safety systems, methods, or devices that may be less damaging to historic spaces, features, and finishes.
Upgrading historic stairways and elevators to meet health and safety codes in a manner that assures their preservation, i.e., so that they are not damaged or obscured.	Damaging or obscuring historic stairways and elevators or altering adjacent spaces in the process of doing work to meet code requirements.

A sprinkler system has been sensitively installed in this highly ornamental plaster ceiling during the building's rehabilitation. Sprinkler heads have been unobtrusively located in the center of the decorative plaster relief.

Recommended	Not Recommended
Installing sensitively designed fire suppression systems, such as sprinkler systems that result in retention of historic features and finishes.	Covering character-defining wood features with fire-resistant sheathing which results in altering their visual appearance.
Applying fire-retardant coatings, such as intumescent paints, which expand during fire to add thermal protection to steel.	Using fire-retardant coatings if they damage or obscure character-defining features.

Recommended

Adding a new stairway or elevator to meet health and safety codes in a manner that preserves adjacent character-defining features and spaces.

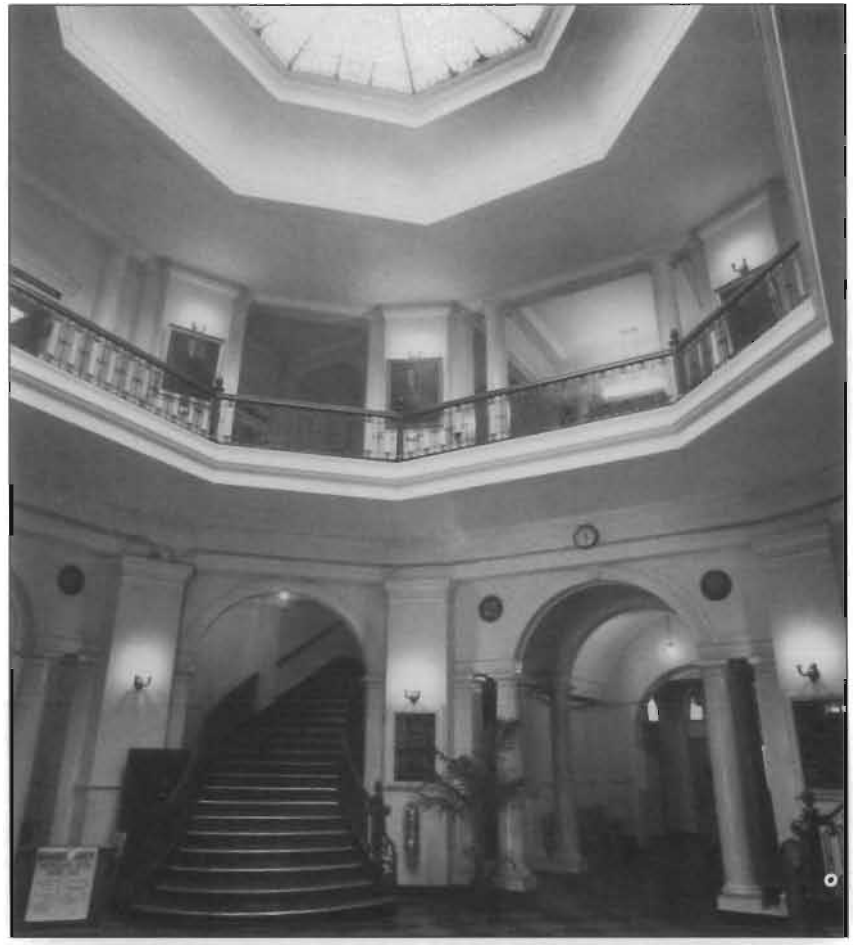
Placing a code-required stairway or elevator that cannot be accommodated within the historic building in a new exterior addition. Such an addition should be on an inconspicuous elevation.

In order to comply with safety codes, it may be necessary to add an exterior fire stair to a historic building as part of a rehabilitation project. The brick stairtower shown on the top is compatible in materials and scale, and inconspicuously attached to the rear elevation of the historic rowhouse. The example on the bottom shows a large-scale concrete and glass stairtower that is incompatible in materials and scale, located as it is on a highly visible elevation of the historic brick building.

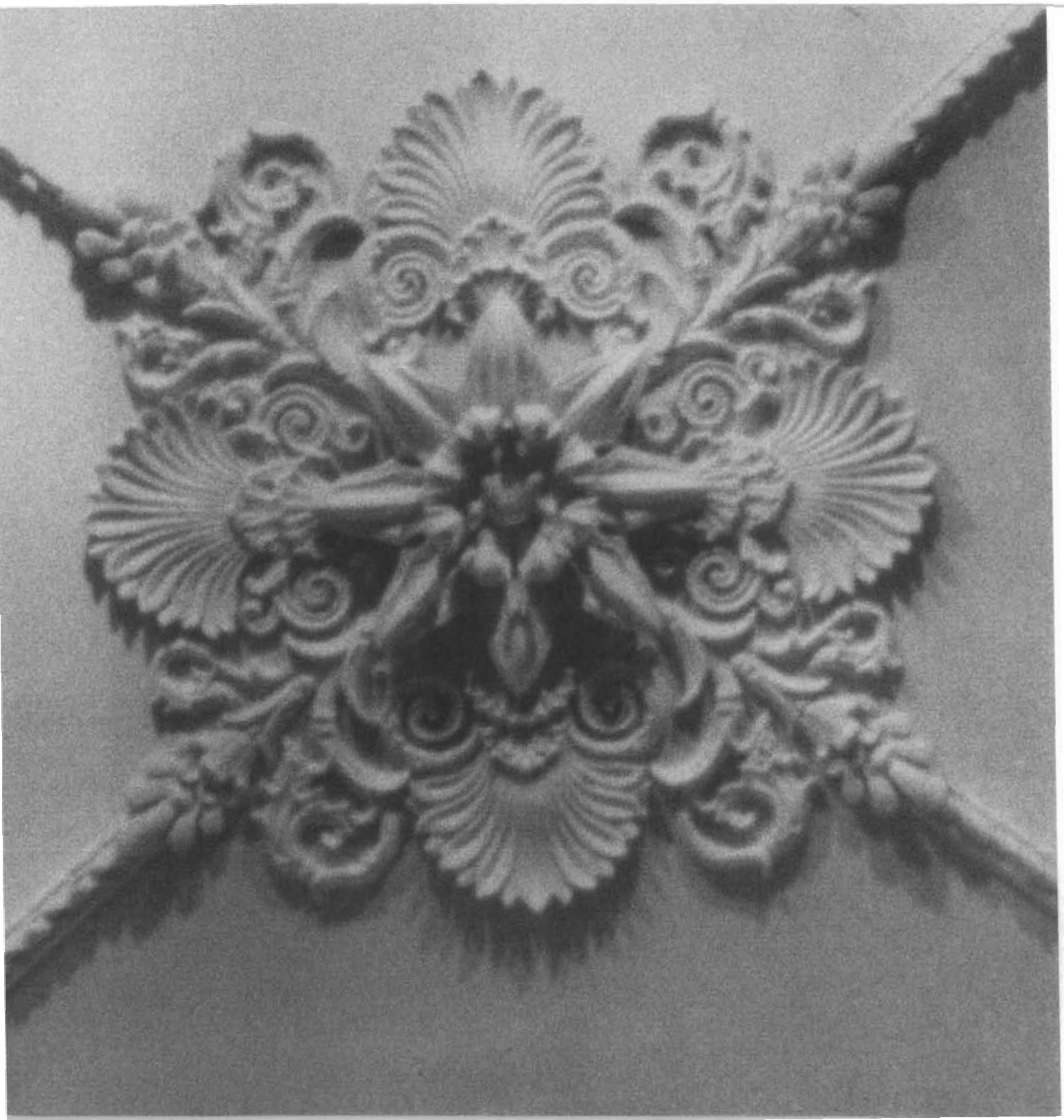
Not Recommended

Radically changing, damaging, or destroying character-defining spaces, features, or finishes when adding a new code-required stairway or elevator.

Constructing a new addition to accommodate code-required stairs and elevators on character-defining elevations highly visible from the street; or where it obscures, damages, or destroys character-defining features.



In buildings such as this historic courthouse, where old lead-based paint is essentially intact and covered with a lead-free topcoat, removing the historic paint because of potential toxicity may not be necessary. Historic paint can provide valuable documentation about the evolution of a building and should be retained, whenever possible.

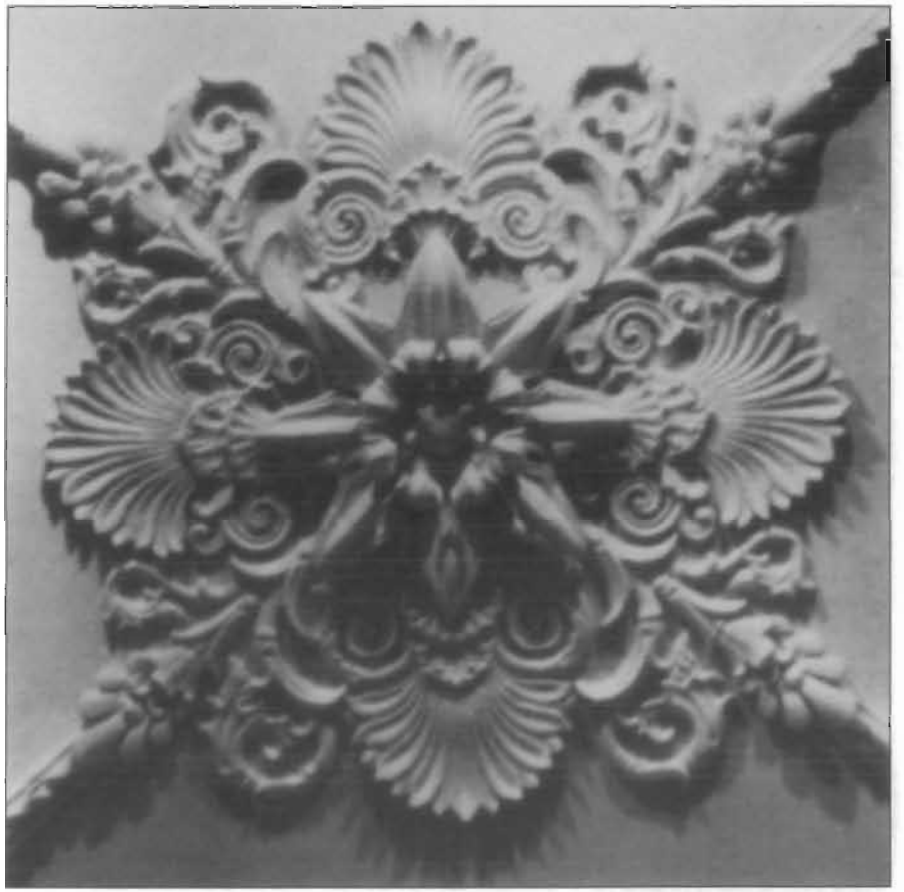


Technical Guidance Publications

Technical Guidance Publications

For a free copy of the TPS catalog of historic preservation publications, write:

Heritage Preservation Services (2255)
Technical Preservation Services
National Park Service
1849 C Street NW,
Washington, D.C. 20240.



Program/Training Information

Federal Historic Preservation Laws. Sara K. Blumenthal, Ed. Lists the major historic preservation laws that govern a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. 59 pages. 1990.

Interpreting the Secretary of the Interior's Standards for Rehabilitation. Michael J. Auer, Ed. Explains how the National Park Service applies the Standards in its administration of the historic preservation tax incentives program. 33 project bulletins. 150 illustrations. 1988.

Preservation Tax Incentives for Historic Buildings. Explains Federal tax incentives available to owners who rehabilitate commercial historic structures. Includes an outline of the certification process, program regulations, and a list of State Historic Preservation Officers. 24 pages. Revised 1990.

Preservation Briefs

Preservation Briefs assist owners and developers of historic buildings in recognizing and resolving common preservation and repair problems prior to work. The briefs are especially useful to preservation tax incentive program applicants because they recommend those methods and approaches for rehabilitating historic buildings that are consistent with their historic character.

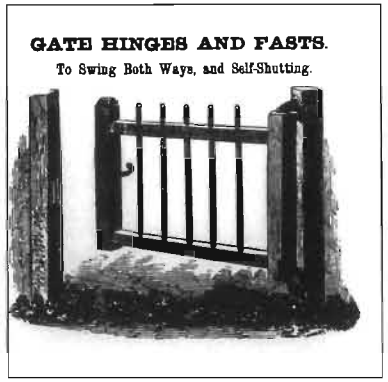
Preservation Briefs 1: The Cleaning and Waterproof Coating of Masonry Buildings. Robert C. Mack, AIA. Provides guidance on cleaning and waterproofing techniques and explains the consequences of their inappropriate use. 4 pages. 5 illustrations. 1975.

Preservation Briefs 2: Repointing Mortar Joints in Historic Brick Buildings. Robert C. Mack, AIA, de Teel Paterson Tiller, and James S. Askins. Provides information on appropriate materials and methods for repointing historic brick buildings. 8 pages. 12 illustrations. 1980.

Preservation Briefs 3: Conserving Energy in Historic Buildings. Baird M. Smith, AIA. Provides information on materials and techniques to consider or avoid when undertaking weatherization and energy conservation measures in historic buildings. 8 pages. 8 illustrations. 1978.

Preservation Briefs 4: Roofing for Historic Buildings. Sarah M. Sweetser. Provides a brief history of the most commonly used roofing materials in America. Presents a sound preservation approach to roof repair, roof replacement, and the use of alternative roofing materials. 8 pages. 16 illustrations. 1978.

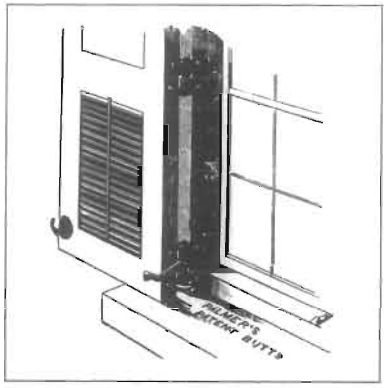
Preservation Briefs 5: The Preservation of Historic Adobe Buildings. Provides information on the traditional materials and construc-



tion of adobe buildings, and the causes of adobe deterioration. Makes recommendations for preserving historic adobe buildings. 8 pages. 15 illustrations. 1978.

Preservation Briefs 6: Dangers of Abrasive Cleaning to Historic Buildings. Anne E. Grimmer. Cautions against the use of sandblasting to clean various building materials and suggests measures to mitigate the effects of improper cleaning. Explains the limited circumstances under which abrasive cleaning may be appropriate. 8 pages. 10 illustrations. 1979.

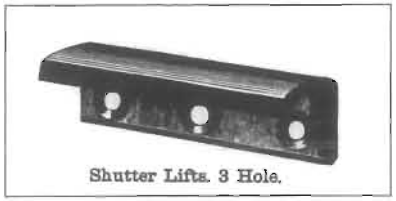
Preservation Briefs 7: The Preservation of Historic Glazed Architectural Terra-Cotta. de Teel Patterson Tiller. Discusses deterioration problems that commonly occur with terra-cotta and provides methods for determining the extent of such deterioration. Makes recommendations for maintenance and repair, and suggests appropriate replacement materials. 8 pages. 11 illustrations. 1979.



Preservation Briefs 8: Aluminum and Vinyl Siding on Historic Buildings: The Appropriateness of Substitute Materials for Resurfacing Historic Wood Frame Buildings. John H. Myers, revised by Gary L. Hume. Discusses various types of historic wood siding and repair and replacement in kind. Outlines the instances under which substitute siding may be an acceptable alternative. 7 pages. 5 illustrations. Rev, 1984.

Preservation Briefs 9: The Repair of Historic Wooden Windows. John H. Myers. Provides useful information on evaluating and repairing historic wooden windows found in typical rehabilitation projects. Emphasizes practical methods for homeowners or developers. 8 pages. 10 illustrations. 1981.

Preservation Briefs 10. Exterior Paint Problems on Historic Woodwork. Kay D. Weeks and David W. Look, AIA. Identifies and describes common types of paint surface conditions and failures. Provides guidance on preparing historic woodwork for repainting, including limited and total paint removal. 12 pages. 14 illustrations. 1982.



Shutter Lifts. 3 Hole.

Preservation Briefs 11. Rehabilitating Historic Storefronts. H. Ward Jandl. Explores the role of the storefront in historic buildings and provides guidance on rehabilitation techniques for historic storefronts as well as compatible new storefront designs. 12 pages. 12 illustrations. 1982.

Preservation Briefs 12. The Preservation of Historic Pigmented Structural Glass (Vitrolite and Carrara Glass). Provides information on the early manufacture, installation, and use of this decorative building product commonly found in 20th century buildings; reasons for its damage; and a general approach for its maintenance, repair, and replacement. 8 pages. 16 illustrations. 1984.

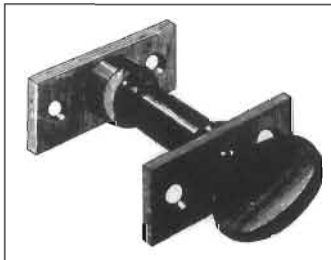
Preservation Briefs 13. The Repair and Thermal Upgrading of Historic Steel Windows. Sharon C. Park, AIA. Presents brief historical background on the development, use, and styles of rolled steel windows popular in the first half

of the 20th century. Explains steps for cleaning and repairing damaged steel windows; also provides information on appropriate methods of weatherstripping and options for storm panels or the installation of thermal glass. 12 pages. 10 illustrations. 1984.

Preservation Briefs 14: New Exterior Additions to Historic Buildings: Preservation Concerns. Kay D. Weeks. Uses a series of examples to suggest ways that attached new additions can successfully serve contemporary uses as part of a rehabilitation project while preserving significant historic materials and features and the building's historic character. 12 pages. 30 illustrations. 1986.

Preservation Briefs 15: Preservation of Historic Concrete: Problems and General Approaches. William B. Coney, AIA. Focuses on cast-in-place and reinforced concrete. The guidance addresses the causes of concrete deterioration, the signs of deterioration, and actual concrete repair. 12 pages. 27 illustrations. 1987.

Preservation Briefs 16: The Use of Substitute Materials on Historic Building Exteriors. Sharon C. Park, AIA. Includes a discussion of when to use substitute materials, cautions regarding their expected performance, and descriptions of several substitute materials together with their advantages and disadvantages. Summary charts are included. 14 pages. 34 illustrations. 1988.



Shutter Screws.

Preservation Briefs 17: Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character. Lee H. Nelson, FAIA. Essential guidance to help property owners and architects identify those features of historic buildings that give the building its visual character so that their preservation can be maximized in rehabilitation. 12 pages. 27 illustrations. 1988.

Preservation Briefs 18: Rehabilitating Interiors in Historic Buildings—Identifying Character-Defining Elements. H. Ward Jandl. Assists building owners in identifying significant interior spaces, features, and finishes so they may be preserved in rehabilitation work. The guidance applies to all building types and styles, from 18th century churches to 20th century office buildings. 8 pages. 11 illustrations. 1988.

Preservation Briefs 19: The Repair and Replacement of Historic Wooden Shingle Roofs. Sharon C. Park, AIA. Discusses historic wooden roofing, expectations for longevity, and repair and replacement options. Identifies roofing material that duplicates the appearance of a historic roof, offers guidance on proper installation, and provides information on coatings and maintenance procedures to help preserve the new roof. 12 pages. 16 illustrations. 1989.

Preservation Briefs 20: The Preservation of Historic Barns. Michael J. Auer. Identifies historic barn types, helps owners understand the historic character of their barns, and offers advice on the maintenance, repair, and rehabilitation of old and historic barns. 12 pages. 30 illustrations. 1989.

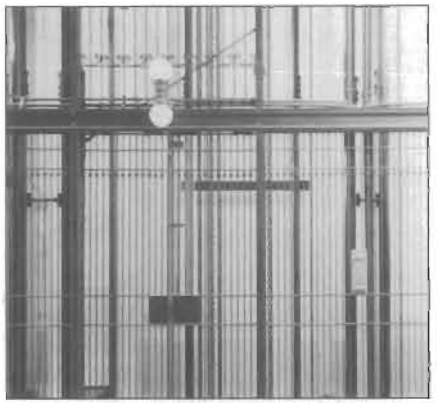
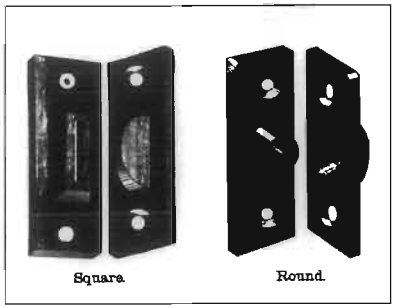


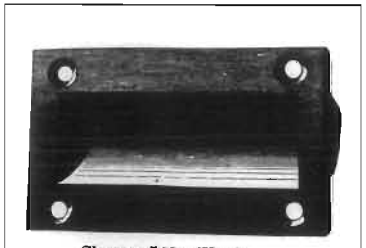
Photo: Richard Nickel, HABS



Preservation Briefs 21: Repairing Historic Flat Plaster—Walls and Ceilings. Marylee MacDonald. Guides building owners on repairing historic plaster using traditional materials and techniques. Suggests replacement options if the historic plaster is severely deteriorated. Useful chart on various plaster bases and compatible basecoats and finish coats. 14 pages. 17 illustrations. 1989.

Preservation Briefs 22: The Preservation and Repair of Historic Stucco. Anne E. Grimmer. Describes the evolution of stucco as a popular building material, beginning with a brief history of how stucco is applied, and how its composition, texture, and surface patterns have changed. Includes guidelines for the historic property owner or manager on repairing historic stucco, with sample mixes for 18th, 19th, and 20th century stucco types. 16 pages. 33 illustrations. 1990.

Preservation Briefs 23: Preserving Historic Ornamental Plaster. David Flaharty. Explains the processes of run-in-place and cast ornamentation by using three common decorative forms as examples: the cornice, ceiling medallion, and coffered ceiling. Illustrates common causes of plaster deteroriation and repair techniques. Useful advice on selecting and evaluating a restoration contractor is included. 14 pages. 34 illustrations. 1990.

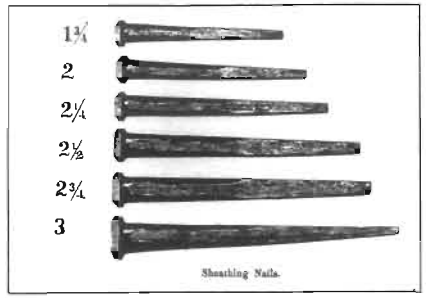

Shutter Lifts, Flush.

Preservation Briefs 24: Heating, Ventilating, and Cooling Historic Buildings: Problems and Recommended Approaches. Sharon C. Park, AIA. Outlines the history of mechanical systems from the 18th c. to the early 20th c. Discusses issues involving occupant comfort and climate control. Underscores the importance of careful planning in order to balance preservation objectives with the interior climate needs of historic buildings. Useful chart included that gives an overview of contemporary HVAC systmes together with advantages and disadvantages. 12 pages. 17 illustrations. September, 1991.

Preservation Briefs 25: The Preservation of Historic Signs. Michael J. Auer. Reviews sign types and practices from the 18th c. to the 1960's. Discusses the complex issues involved in repairing and re-using historic signs for contemporary businesses. 12 pages. 30 illustrations. September, 1991.

Preservation Briefs 26: The preservation and Repair of Historic Log Buildings. Bruce D. Bomberger. Reviews and illustrates historic log construction from the 18th c. to the early 20th c., focusing on horizontally-laid logs. Disucesses traditional splicing-in techniques, the use of epoxies, and log replacement, as well as guidance on the repair and replacement of chinking and daubing. 16 pages. 25 illustrations. September, 1991.

Preservation Briefs 27: The Maintenance and Repair of Architectural Cast Iron. John G. Waite, AIA. Historical Overview by Margot Gayle. Discusses cast iron in terms of 19th century industrial development. Emphasizes the importance of this versatile material in architectural building design, technology, and ornamentation. Provides essential guidance on maintain-



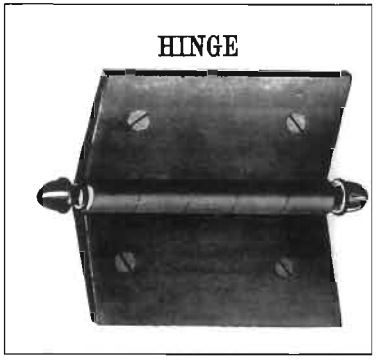
ing and repairing architectural cast iron within rehabilitiation projects. 14 pages. 25 illustrations. September, 1991.

Technical Reports

Technical Reports address in detail problems confronted by architects, engineers, government officials, and other technicians involved in the preservation of historic buildings.

A Glossary of Historic Masonry Deterioration Problems and Preservation Treatments. Anne E. Grimmer. Generously illustrated, provides information on 22 common masonry deterioration problems and their known treatments. Intended for use both as a general reference tool and an on-site interpretive guide in the maintenance and preservation of historic structures. 68 pages. 41 illustrations. 1984. Bibliography.

Access to Historic Buildings for the Disabled: Suggestions for Planning and Implementation. Charles Parrott. Describes methods to achieve barrier-free access to historic buildings that conform with the Department of the Interior's historic preservation standards. Addresses a variety of specific needs for the disabled, including ramps, vertical wheelchair lifts, curb cuts, railings, restrooms, miscellaneous fixtures, and signs. Also examines techniques to make programs and services housed in historic buildings accessible in lieu of architectural changes. 92 pages. 42 illustrations. 1980. Bibliography.



Cyclical Maintenance for Historic Buildings. J. Henry Chambers, AIA. Provides a step-by-step process for building managers, architects, and others involved in the routine maintenance of historic properties. 125 pages. 1976. Bibliography.

Epoxies for Wood Repairs in Historic Buildings. Morgan W. Phillips and Dr. Judith E. Selwyn. Presents research findings on the use of epoxies to preserve historic wood features rather than replacing them. Discusses low-viscosity epoxy consolidants that can be soaked into rotted wood in order to restore its solidity; and epoxy pastes for filling holes and cracks in historic woodwork. Includes useful case-study applications, suggested formulations, and lists of suppliers. 72 pages. 43 illustrations. Appendix. 1978.

Gaslighting in America: A Pictorial Survey, 1815-1910. Denys Peter Myers. Surveys the types and style of gas fixtures that appeared in the rooms and on the streets of 19th and early 20th century America. 279 pages. 120 illustrations. Originally published by the National Park Service in 1978, re-issued by Dover Press, New York, in 1990.

Keeping it Clean: Removing Dirt, Paint, Stains, and Graffiti from Historic Exterior Masonry. Anne E. Grimmer. Covers virtually every aspect of a cleaning project—identifying building materials to be cleaned and ones that might be affected by cleaning; scheduling cleaning around other work; what to ask for in cleaning "specs;" and what kind of test cleaning procedures to use. Useful chart summarizes

Patent Fire Hydrant

cleaners and removal techniques. 45 pages. 35 illustrations. Bibliography.

Metals in America's Historic Buildings: Uses and Preservation Treatments. Margot Gayle and David W. Look, AIA. One of the most complete sourcebooks available on historic architectural metals, such as lead, tin, zinc, bronze, copper, iron, nickel, steel and aluminum. Part 1 focuses on the identification and historic uses of architectural metals; Part 2 provides in-depth information on repair and preservation methods, discussing each metal individually. 168 pages. 180 illustrations. Bibliography. 1980.

Moisture Problems in Historic Masonry Walls: Diagnosis and Treatment. Baird M. Smith, AIA. Intended for architects, building owners, property managers, and others responsible for the care and maintenance of historic buildings. Discusses problems caused by excessive moisture in historic masonry walls and outlines a methodology for diagnosing such problems and selecting appropriate treatments. 48 pages. 32 illustrations. 1984. Bibliography.

Moving Historic Buildings. John Obed Curtis. Discusses the limited circumstances under which a historic masonry or frame building should be moved. Establishes a methodology for planning, research, and recording prior to the move; and addresses the siting, foundation construction, building reassembly, and restoration work after a successful move has taken place. 50 pages. 47 illustrations. Bibliography.

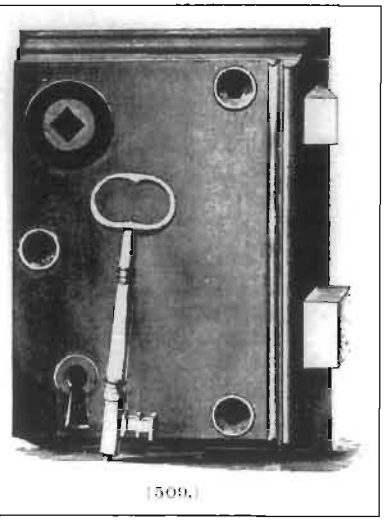
Photogrammetric Recording of Cultural Resources. Perry E. Borchers. Describes the basic principles of photogrammetry and their application to the recording of cultural resources. Includes several case study applications. 38 pages. 27 illustrations. Bibliography. 1977.

Rectified Photography and Photo Drawings for Historic Preservation. J. Henry Chambers, AIA. Explains the process of making photographic negatives of a predetermined size or scale which can be enlarged to a convenient architectural scale, then printed on photosensitive drafting film for working drawings, surveys, and feasibility studies. 38 pages. 13 illustrations. 1973.

Using Photogrammetry to Monitor Materials Deterioration and Structural Problems on Historic Buildings: Dorchester Heights Monument, A Case Study. J. Henry Chambers, AIA. Details the cost-effectiveness of close-range photogrammetry in monitoring the condition of historic masonry structures, particularly when more conventional methods of inspection are impracticable. 16 pages. 6 illustrations. Bibliography. 1985.

X-Ray Examination of Historic Structures. David M. Hart. Explains a method for nondestructive probing of historic buildings that permits investigation of components normally hidden from view. Intended for architects, conservators, and other professionals. 24 pages. 19 illustrations. Bibliography. 1975.

Photo: Jack E. Boucher, HABS



Preservation Case Studies

Preservation Case Studies provide practical, solution-oriented information for developers, planners, and owners by presenting and illustrating a specific course of action taken to preserve one building or an entire block of buildings. Individual case studies may highlight an innovative rehabilitation technique, financing strategies, or an overall planning methodology.

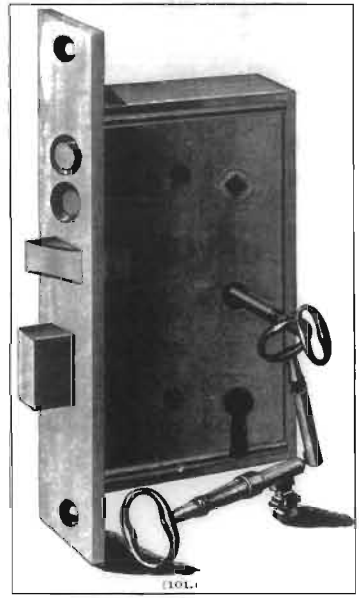
Abbeville, South Carolina: Rehabilitation Planning and Project Work the Commercial Town Square. John M. Bryan and the Triad Architectural Associates. Excellent planning guide for historic building owners interested in rehabilitating an entire block to enhance local commercial trade. Uses a series of architectural drawings and sketches, recommends preservation work for each building inventoried as well as the urban setting. 55 pages. 24 illustrations. 1979.

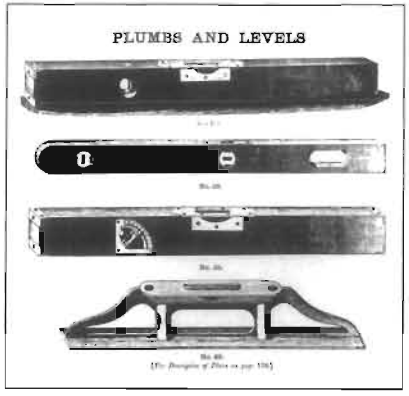
Fort Johnson, Amsterdam, New York: A Historic Structure Report. Mendel-Mesick-Cohen. From an on-site inspection conducted in 1974-1975, shows steps to take prior to undertaking preservation or restoration work on a historic building. Documents the current state of the building's exterior and interior materials and overall structural stability. Recommends work that meets the Department of Interior's historic preservation standards. Archeological report included. 54 pages. 89 illustrations. Appendices. 1978.

Main Street Historic District, Van Buren, Arkansas: Storefront Rehabilitation/Restoration Within a Districtwide Plan. Susan Guthrie. Illustrates in detail how storefronts in a small town's commercial center were successfully rehabilitated. Emphasizes both planning and rehabilitation by inclusion of working drawings, and before, during and after photographs. 31 pages. 30 illustrations. 1980.

Maymont Park-The Italian Garden, Richmond, Virginia: Landscape Restoration. Barry W. Starke, ASLA. Outlines step-by-step process of conducting historical research on a National Register-listed park, preparing existing conditions documentation, and recommending project work. Includes the landscape architect's drawings and specifications to restore stone walls, garden walkways, and domed pergola according to Department of the Interior historic preservation standards. 39 pages. 29 illustrations. 1980.

Planning for exterior Work on the First Parish Church, Portland, Maine, Using Photographs as Project Documentation. John C. Hecker, AIA, and Sylvanus W. Doughty. Using annotated photographs detailing physical damage and deterioration of a specific church building, shows how project work recommendations were made. Useful methodology for owners and developers planning rehabilitation work on any building. Includes architectural specifications for several work areas, such as site improvements, mortar, brick masonry, rough carpentry, slate roofing, dampproofing,





flashing, and painting. 58 pages. 15 illustrations. Secretary of the Interior's Standards as Appendix. 1979.

Olmsted Park System, Jamaica Pond Boathouse, Jamaica Plain, Massachusetts: Planning for the Preservation of the Boathouse Roof. Richard White. Focuses on planning the preservation of a specific public park building, but useful for planning an entire project to meet Department of Interior historic preservation standards. Presents a responsible process of documenting proposed work, including a brief history of the site and building, evaluation of deterioration, architectural drawings, and a summary of successful completed work. 58 pages. 25 illustrations. Appendix. 1979.

Rehabilitating Historic Hotels: Peabody Hotel, Memphis, Tennessee. Floy A. Brown. Explains use of the preservation tax credit to rehabilitate an important downtown hotel. Outlines the success of other hotel rehabilitations across the United States, then focuses on the Peabody Hotel in Memphis. The case study describes the Peabody's architectural importance, the scope of rehabilitation work, and the funding initiative. 44 pages. 21 illustrations. Appendix. 1979.

The Morse-Libby Mansion: A Report on Restoration Work, 1973-1977. Morgan W. Phillips. Describes and illustrates preservation methods and techniques used in the exterior restoration of an Italianate mansion. 55 pages. 84 illustrations. Appendices. 1977.

Preservation Tech Notes

Preservation Tech Notes (PTN) provide innovative solutions to specific problems in preserving cultural resources—buildings, structures, and objects. Tech Notes are intended for practitioners in the preservation field, including architects, contractors, and maintenance personnel, as well as for owners and developers seeking the preservation tax investment credit for rehabilitation. Topic categories for this series to date include doors, windows, finishes, interior spaces, mechanical systems, museum collection storage, temporary protection, exterior woodwork, masonry, and metals.

PTN 1 Windows(1): Planning Approaches to Window Preservation by Charles E. Fisher. January, 1984.

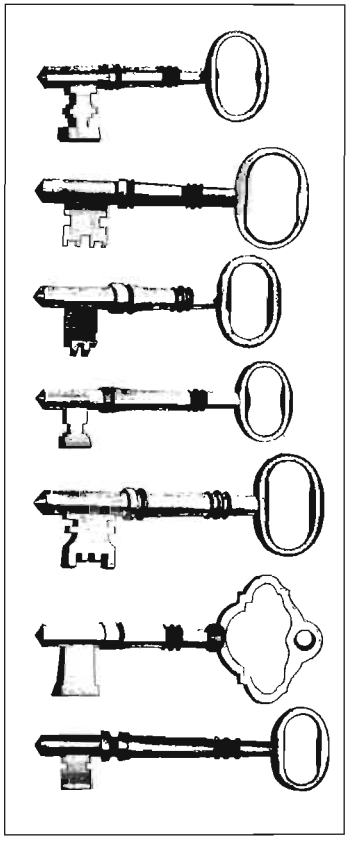
PTN 2 Windows(2): Installing Insulating Glass in Existing Steel Windows by Charles E. Fisher. January, 1984.

PTN 3 Windows(3): Exterior Storm Windows: Casement Design Wooden Storm Sash by Wayne Trissler and Charles E. Fisher. January, 1984.

PTN 4 Windows(4): Replacement Wooden Frames and Sash: Protecting Woodwork Against Decay by William C. Feist. January, 1984.

PTN 5 Windows(5): Interior Metal Storm Windows by Laura A. Muckenfuss and Charles E. Fisher. January, 1984.

Photo: Jack E. Boucher, HABS



PTN 6 Windows(6): Replacement Wooden Sash and Frames with Insulating Glass and Integral Muntins by Charles Parrott. January, 1984.

PTN 7 Windows(7): Window Awnings by Laura A. Muckenfuss and Charles E. Fisher. September, 1984.

PTN 8 Windows(8): Thermal Retrofit of Historic Wooden Sash Using Interior Piggy-back Storm Panels by Sharon C. Park, AIA. September, 1984.

PTN 9 Windows(9): Interior Storm Windows: Magnetic Seal by Charles E. Fisher. September, 1984.

PTN 10 Temporary Protection(1): Temporary Protection of Historic Stairways During Rehabilitation Work by Charles E. Fisher. March, 1985.

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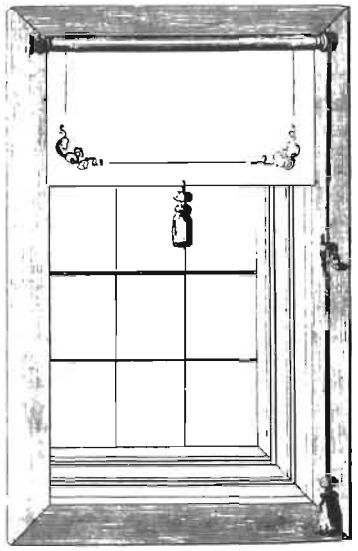

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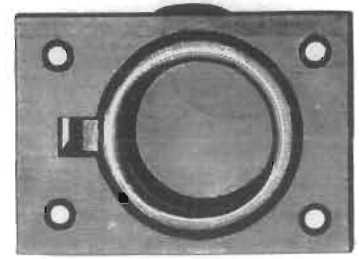
FLUSH RINGS



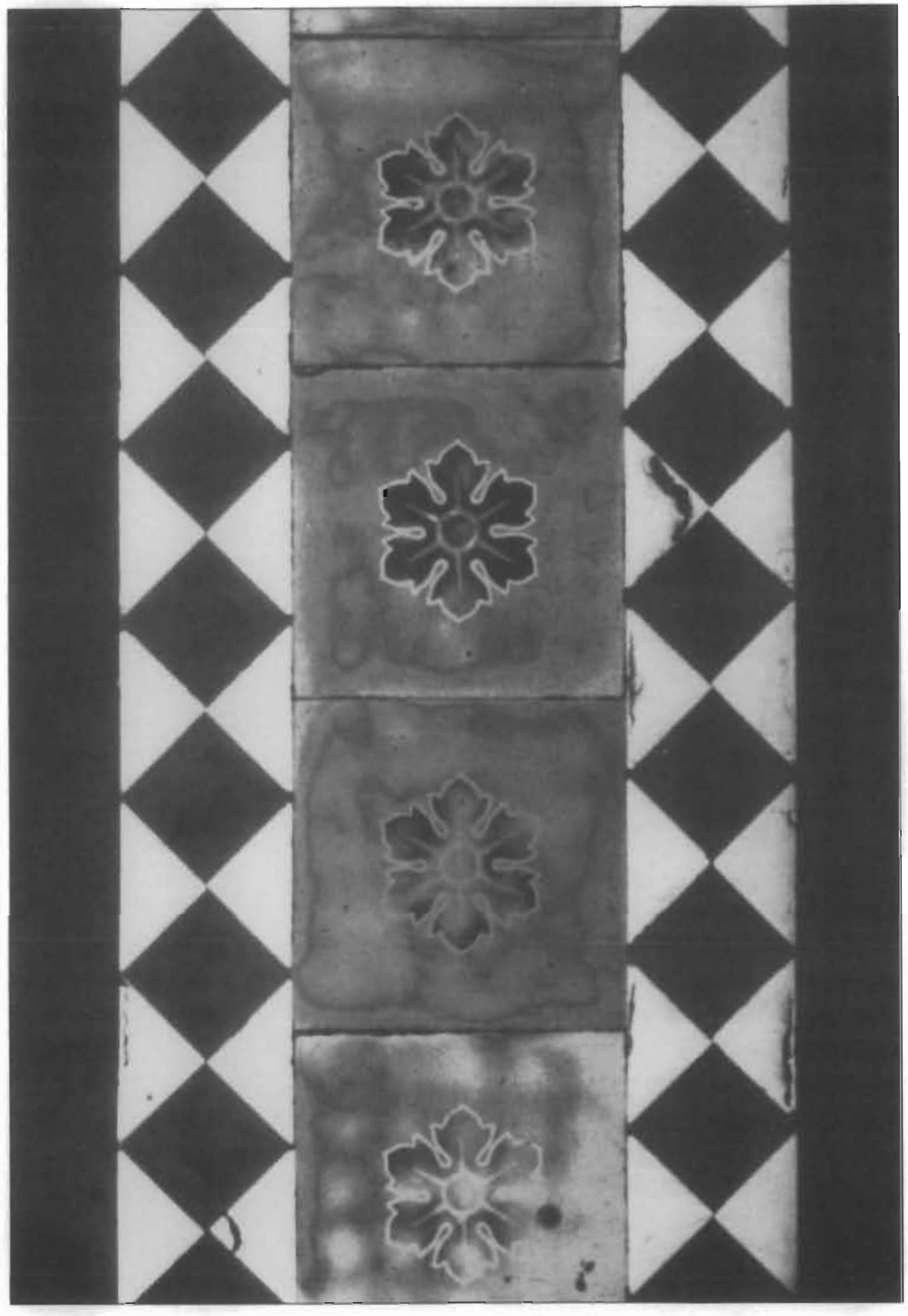
Flush Rings, for Sliding Barn and Trap Doors

Co-Published Books

Interiors Handbook for Historic Buildings. National Park Service and the Historic Preservation Education Foundation (HPEF). Charles E. Fisher, Ed. Prepared for a national conference on appropriate interior treatments for historic buildings, includes nearly 400 pages of technical papers as well as guidance for architects, developers, building managers, curators, and property owners. Addresses both rehabilitation and restoration issues, including inspection, evaluation and planning, architectural features and materials, systems and fixtures, space utilization and adaptive reuse, finishes and decorative accessories, and fire protection and building codes. 550 pages. Illustrated. 1988.

Respectful Rehabilitation: Answers to Your Questions on Historic Buildings. National Park Service and National Trust for Historic Preservation. Kay D. Weeks and Diane Maddex, Eds. Provides answers to 150 questions often asked in rehabilitating historic buildings for new uses. 185 pages. 150 illustrations. Bibliography. 1982.

The Window Handbook: Successful Strategies for Rehabilitating Windows in Historic Buildings. National Park Service and the Center for Architectural Conservation, Georgia Institute of Technology. Charles E. Fisher, Ed. 16 Preservation Tech Notes on windows. 262 pages. Illustrated. Appendices. 1986.



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