THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION &

ILLUSTRATED GUIDELINES ON **SUSTAINABILITY** FOR REHABILITATING HISTORIC BUILDINGS

U.S. Department of the Interior
National Park Service
Technical Preservation Services

Cover Photo: Green roof at the U.S. Department of the Interior, Washington, D.C.

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Acknowledgements

The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings was produced by Anne E. Grimmer and Kay D. Weeks, first published in 1992 and reprinted in 1997. The *Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings*, which are presented in the same format, replace the chapter on "Energy Conservation" in the 1992 publication. They have been developed with the guidance and support of numerous public agencies, professional organizations and individuals.

All photographs and drawings included here not individually credited have been selected from National Park Service files.

Foreword

The *Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings* replaces the chapter on "Energy Conservation" in the *Illustrated Guidelines for Rehabilitating Historic Buildings* published in 1992. (This same guidance is presented in the chapter entitled "Energy Retrofitting" in the unillustrated *Guidelines for Rehabilitating Historic Buildings.*) The illustrated version of the *Guidelines for Rehabilitating Historic Buildings* was designed to further enhance overall understanding and interpretation of basic preservation principles. *The Illustrated Guidelines on Sustainability* begin with an overview focusing on the fact that historic buildings are themselves often inherently sustainable and that this should be used to advantage in any proposal to upgrade them. These guidelines offer specific guidance on how to make historic buildings more sustainable in a manner that will preserve their historic character and that will meet *The Secretary of the Interior's Standards for Rehabilitation.* The written guidance is illustrated with examples of appropriate or "recommended" treatments and some that are "not recommended" or could negatively impact the building's historic character. The National Park Service Branch of Technical Preservation Services has developed these illustrated guidelines in accordance with its directive to provide information concerning professional methods and techniques to ensure the preservation and rehabilitation of the historic properties that are an important part of the nation's heritage.

THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

1

[1] Stained glass skylight provides natural light in a historic train station.

Introduction to the Standards

The Secretary of the Interior is responsible for establishing standards for all programs under Departmental authority and for advising federal agencies on the preservation of historic properties listed in or eligible for listing in the National Register of Historic Places. In partial fulfillment of this responsibility *The Secretary of the Interior's Standards for the Treatment of Historic Properties* have been developed to guide work undertaken on historic properties; there are separate standards for preservation, rehabilitation, restoration and reconstruction. *The Standards for Rehabilitation* (codified in 36 CFR 67) comprise that section of the overall treatment standards and address the most prevalent treatment. "Rehabilitation" is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."

Initially developed by the Secretary of the Interior to determine the appropriateness of proposed project work on registered properties supported by the Historic Preservation Fund grant-in-aid program, the Standards have been widely used over the years—particularly to determine if a rehabilitation project qualifies as a Certified Rehabilitation for Federal Historic Preservation Tax Incentives. In addition, the Standards have guided federal agencies in carrying out their responsibilities for properties in federal ownership or control; and state and local officials in reviewing both federal and non-federal rehabilitation proposals. They have also been adopted by historic district and planning commissions across the country.

The intent of the Standards is to assist in the long-term preservation of historic materials and features. The Standards pertain to historic buildings of all materials, construction types, sizes and occupancy and include the exterior and the interior of the buildings. They also encompass the building's site and environment, including landscape features, as well as attached, adjacent or related new construction. To be certified for federal tax purposes, a rehabilitation project must be determined by the Secretary of the Interior to be consistent with the historic character of the structure(s) and, where applicable, the district in which it is located.

2

3

[2-3] Clerestory windows provide natural light in a historic industrial building: Before and after rehabilitation.

4

[4] Covered walkways and horizontal sun screens are distinctive and sustainable features in some mid-century modern office buildings.

As stated in the definition, the treatment "rehabilitation" assumes that at least some repair or alteration of the historic building will be needed in order to provide for an efficient contemporary use; however, these repairs and alterations must not damage or destroy materials, features or finishes that are important in defining the building's historic character. For example, certain treatments—if improperly applied—may cause or accelerate physical deterioration of the historic building. This can include using improper repointing or exterior masonry cleaning techniques, or introducing insulation that may damage historic fabric. Any of these treatments will likely result in a project that does not meet the Standards. Similarly, exterior additions that duplicate the form, material and detailing of the historic structure to the extent that they compromise its historic character also will fail to meet the Standards.

The Secretary of the Interior's Standards for Rehabilitation

The Standards (Department of the Interior regulations 36 CFR 67) pertain to all historic properties listed in or eligible for listing in the National Register of Historic Places.

1) A property shall be used for its intended historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2) The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

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

4) Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5) Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

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

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[5-6] Large windows and a roof monitor provide natural illumination in a historic industrial building.

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[7-9] Porches and canvas awnings provide shade and keep interiors cool in historic residential and commercial buildings.

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7) Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8) Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

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

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

11

[11] A vestibule helps retain interior conditioned air in the living space in this historic row house.

10

[10] Wood shutters provide natural light when open and keep interiors cool when closed in historic residential buildings.

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14

[12-14] Roof monitors provide natural light in historic industrial buildings

GUIDELINES FOR REHABILITATING HISTORIC BUILDINGS

Introduction to the Guidelines

The *Guidelines for Rehabilitating Historic Buildings* were initially developed in 1977 to help property owners, developers and federal managers apply *The Secretary of the Interior's Standards for Rehabilitation* during the project planning stage by providing general design and technical recommendations. Unlike the Standards, the Guidelines are not codified as program requirements.

The Guidelines are general and intended to provide guidance to help in interpreting and applying the Standards to all rehabilitation projects. They are not meant to give case-specific advice. For instance, they cannot tell owners or developers which features in a historic building are important in defining the historic character and must be retained. This case-by-case determination is best accomplished by seeking assistance from qualified historic preservation professionals in the very early stages of project planning.

Like the Standards, the Guidelines pertain to historic buildings of all materials, construction types, sizes and occupancy; and apply to exterior and interior work, as well as new additions and the building's site and environment. The Guidelines are presented in a "Recommended" vs. "Not Recommended" format. Those approaches, treatments and techniques that are consistent with *The Secretary of the Interior's Standards for Rehabilitation* are listed in the "Recommended" column on the left; those approaches, treatments and techniques which could adversely affect a building's historic character are listed in the "Not Recommended" column on the right. To provide clear and consistent guidance for property owners, developers and federal agency managers, the "Recommended" courses of action are listed in order of historic preservation concerns so that a rehabilitation project may be successfully planned and completed—one that, first, assures the preservation of a building's important or "character-defining" architectural materials, features and spaces and, second, makes possible an efficient contemporary use. The guidance that follows begins with the most basic and least invasive approaches that will help the project achieve the desired goal, before considering work that may involve more change and potentially greater impact on the historic character of the building.

Sustainability

Before implementing any energy conservation measures to enhance the sustainability of a historic building, the existing energy-efficient characteristics of the building should be assessed. Buildings are more than their individual components. The design, materials, type of construction, size, shape, site orientation, surrounding landscape and climate all play a role in how buildings perform. Historic building construction methods and materials often maximized natural sources of heating, lighting and ventilation to respond to local climatic conditions. The key to a successful rehabilitation project is to identify and understand any lost original and existing energy-efficient aspects of the historic building, as well as to identify and understand its character-defining features to ensure they are preserved. The most sustainable building may be one that already exists. Thus, good preservation practice is often synonymous with sustainability. There are numerous treatments--traditional as well as new technological innovations--that may be used to upgrade a historic building to help it operate even more efficiently. Increasingly stricter energy standards and code requirements may dictate that at least some of these treatments be implemented as part of a rehabilitation project of any size or type of building. Whether a historic building is rehabilitated for a new or a continuing use, it is important to utilize the building's inherently-sustainable qualities as they were intended. It is equally important that they function effectively together with any new measures undertaken to further improve energy efficiency.

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[15] Glass skylight illuminates historic shopping arcade.

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[16-18] Inherently sustainable features of historic buildings: Shutters and a deep porch keep the interior cool in a historic house in a warm climate (top); a skylight provides natural light to the interior of this mid-20th century house (center); partially glazed partitions and doors allow natural light into the corridor of a historic office building (bottom).

18

PLANNING

RECOMMENDED	NOT RECOMMENDED
Forming an integrated sustainability team when working on a large project that includes a preservation professional to ensure that the character and integrity of the historic building is maintained during any upgrades.	Omitting preservation expertise from a sustainability project team.
Analyzing the condition of inherently-sustainable features of the historic building, such as shutters, storm windows, awnings, porches, vents, roof monitors, skylights, light wells, transoms and naturally-lit corridors, and including them in energy audits and energy modeling, before planning upgrades.	Ignoring inherently-sustainable features of the existing historic building when creating energy models and planning upgrades.
Identifying ways to reduce energy use, such as installing fixtures and appliances that conserve resources, including energy-efficient lighting or energy-efficient lamps in existing light fixtures, low-flow plumbing fixtures, sensors and timers that control water flow, lighting and temperature, before undertaking more invasive treatments that may negatively impact the historic building.	
Prioritizing sustainable improvements, beginning with minimally invasive treatments that are least likely to damage historic building material.	Beginning work with substantive or irreversible treatments without first considering and implementing less invasive measures.

MAINTENANCE

RECOMMENDED	NOT RECOMMENDED
Maintaining historic buildings regularly to preserve historic fabric and maximize operational efficiency.	Delaying maintenance treatments which may result in the loss of historic building fabric or decrease the performance of existing systems or features.
Retaining and repairing durable historic building materials	Removing durable historic building materials and replacing them with materials perceived as more sustainable; for instance, removing historic heart pine flooring and replacing it with new bamboo flooring.
Using environmentally-friendly cleaning products that are compatible with historic finishes.	Using cleaning products potentially harmful to both historic finishes and the environment.
Using sustainable products and treatments, such as low VOC paints and adhesives and lead-safe paint removal methods, as much as possible, when rehabilitating a historic building.	

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Recommended: [19] Caulking the gap between the aluminum storm window and wood window frame helps maximize thermal efficiency in this historic residence.

[20] Using sustainable cleaning products preserves both the environment and the historic building.

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Not Recommended: [21-22] The peeling paint on an exterior window sill and on the interior of a window indicates that these features have not received regular maintenance. The broken casement window hardware also needs to be repaired to make the window operable.

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Recommended: [23-25] Historic exterior storm windows have been well maintained and continue to perform as intended.

WINDOWS

RECOMMENDED	NOT RECOMMENDED
Maintaining windows on a regular basis to ensure that they function properly and are completely operable.	Neglecting to maintain historic windows and allowing them to deteriorate beyond repair with the result that they must be replaced.
Retaining and repairing historic windows when deteriorated.	Removing repairable historic windows and replacing them with new windows for perceived improvement in energy performance.
Weather stripping and caulking historic windows, when appropriate, to make them weather tight.	
Installing interior or exterior storm windows or panels that are compatible with existing historic windows.	Replacing repairable historic windows with new insulated windows.

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Recommended: [26] The new metal interior storm window was carefully matched to the exterior window as part of the rehabilitation of this historic armory building.

Not Recommended: [27] A broken sash cord can be repaired easily and does not justify replacement of the window.

27

WINDOWS

RECOMMENDED	NOT RECOMMENDED
Installing compatible and energy-efficient replacement windows that match the appearance, size, design, proportion and profile of the existing historic windows and that are also durable, repairable and recyclable, when existing windows are too deteriorated to repair.	Installing incompatible or inefficient replacement window units that are not durable, recyclable or repairable when existing windows are deteriorated beyond repair or missing.
Replacing missing windows with new, energy-efficient windows that are appropriate to the style of historic building and that are also durable, repairable and recyclable.	
Retrofitting historic windows with high-performance glazing or clear film, when possible, and only if the historic character can be maintained.	

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32

Not Recommended: [31-32] Ill-fitting exterior aluminum storm windows viewed from both inside and outside are clearly not energy efficient.

Not Recommended: [30] Not only have incompatible windows that do not fit the size and shape of the historic window openings been installed, but the original openings have also been shortened to install through-the-wall HVAC units.

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Recommended: [28-29] These exterior storm windows match the pane configuration of the historic interior windows in a residence and in a multi-story hotel building.

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Recommended: [33-35] Original metal windows were appropriately repaired as part of the rehabilitation of this historic industrial building.

WINDOWS

RECOMMENDED	NOT RECOMMENDED
Retrofitting historic steel windows and curtain-wall systems to improve thermal performance without compromising their character.	
Installing clear, low-emissivity (low-e) glass or film without noticeable color in historically-clear windows to reduce solar heat gain.	Retrofitting historically-clear windows with tinted glass or reflective coatings that will negatively impact the historic character of the building.
Installing film in a slightly lighter shade of the same color tint when replacing glazing panels on historically-dark-tinted windows to improve daylighting.	Introducing clear glazing or a significantly lighter colored film or tint than the original to improve daylighting when replacing historically dark-tinted windows.

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Recommended: [36-38] Original metal windows were retained and made operable during the rehabilitation of this historic mill complex. Installing patio slider doors as interior storm windows was a creative and successful solution to improve the energy efficiency of the existing windows.

WINDOWS

RECOMMENDED	NOT RECOMMENDED
Maintaining existing, reinstalling or installing new, historically-appropriate shutters and awnings.	Removing historic shutters and awnings or installing inappropriate ones.
Repairing or reopening historically-operable interior transoms, when possible, to improve air flow and cross ventilation.	Covering or removing existing transoms.

39

Recommended: [39-40] The original windows, which were deteriorated beyond repair, featured a dark tint. They were replaced with a slightly lighter-tinted glazing to improve daylighting in this mid-century modern office building.

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41

Recommended: [41] Traditional canvas awnings should be retained when they exist on historic buildings.

42

Recommended: [42] Transoms and screen doors are distinctive and practical features that provided cross ventilation in this historic hotel.

43

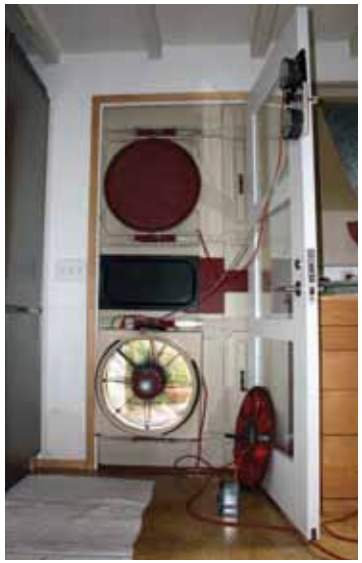
Recommended: [43] The wall and door glazing ensures that the corridor receives natural daylight and the operable transom helps air to circulate in this historic office building.

WEATHERIZATION AND INSULATION

RECOMMENDED	NOT RECOMMENDED
Using a variety of analytical tools, such as a comprehensive energy audit, blower door tests, infrared thermography, energy modeling or daylight modeling, to gain an understanding of the building's performance and potential before implementing any weatherization or retrofit treatments.	Implementing energy-retrofit measures without first diagnosing the building's performance and energy needs.
Developing a weatherization plan based on the results of the energy analysis of the building's performance and potential.	
Eliminating infiltration first, beginning with the least invasive and most cost-effective weatherization measures, such as caulking and weather stripping, before undertaking more invasive weatherization measures.	Undertaking treatments that result in loss of historic fabric, for example, installing wall insulation that requires removing plaster, before carrying out simple and less damaging weatherization measures.
Understanding the inherent thermal properties of the historic building materials and the actual insulating needs for the specific climate and building type before adding or changing insulation.	
Insulating unfinished spaces, such as attics, basements and crawl spaces, first.	Insulating a finished space, which requires removing historic plaster and trim, before insulating unfinished spaces.

Recommended: [44-45] A blower door test is a useful tool to help identify air infiltration in a historic building before undertaking weatherization or retrofit treatments. *Top Photo: Robert J. Cagnetta, Heritage Restoration, Inc.*

44



45

Recommended: [46] A hand-held infrared scanner reveals areas that are not well insulated and that allow heat transfer through the walls of a building.

46

Recommended: [47-48] Insulation should be installed first in unfinished areas such as attics, crawl spaces and basements of residential buildings.

47

48

WEATHERIZATION AND INSULATION

RECOMMENDED	NOT RECOMMENDED
Using the appropriate type of insulation in unfinished spaces and ensuring the space is adequately ventilated.	Using wet-spray or other spray-in insulation that is not reversible or may damage historic materials.
	Adding insulation in cavities that are susceptible to water infiltration.
Ensuring that air infiltration is reduced before adding wall insulation.	Insulating walls without first reducing air infiltration.
Installing appropriate wall insulation, only if necessary, after lower impact treatments have been carried out.	Installing wall insulation that is not reversible and that may cause damage to historic building materials.
	Installing insulation on the exterior of a historic building, which results in the loss of historic materials and may alter the proportion and relationship of the wall to the historic windows and trim.
Removing interior plaster only in limited quantities and when absolutely necessary to install appropriate insulation.	Removing all interior plaster to install appropriate insulation.
Replacing interior plaster—removed to install insulation—with plaster or gypsum board to retain the historic character of the interior, and in a manner that retains the historic proportion and relationship of the wall to the historic windows and trim.	Replacing interior plaster—removed to install insulation—with gypsum board that is too thick and that alters the historic proportion and relationship of the wall to the historic windows and trim.
Reinstalling historic trim that was removed to install insulation.	Replicating trim rather than retaining and reinstalling historic trim that is repairable.

Not Recommended: [49] The original proportion and relationship of the wall to the door trim has been all but lost because the gypsum board installed was too thick.

[50-51] When wall insulation was installed here the walls were furred out, which created deep, historically inappropriate window recesses. The repairable historic trim was also not reinstalled.

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Recommended: [52-53] The original proportion and relationship of the wall to the windows and trim, which is important in defining the character of these historic interior spaces, has been retained here.

54

Recommended: [54] This rigid insulation has been correctly installed in the wall cavity so that when the gypsum board is hung the original proportion and relationship of the wall to the trim will be retained.
Photo: Robert J. Cagnetta, Heritage Restoration, Inc.

HEATING, VENTILATING AND AIR CONDITIONING (HVAC) AND AIR CIRCULATION

RECOMMENDED	NOT RECOMMENDED
Retaining and maintaining functional and efficient HVAC systems.	Replacing existing HVAC systems without testing their efficiency first.
Upgrading existing HVAC systems to increase efficiency and performance within normal replacement cycles.	Replacing HVAC systems prematurely when existing systems are operating efficiently.
Installing an energy-efficient system that takes into account whole building performance and retains the historic character of the building and site when a new HVAC system is necessary.	Installing an inefficient HVAC system or installing a new system based on pre-retrofit building performance when a smaller system may be more appropriate.

55

Recommended: [55-57] Wood vents in the gable ends of a historic house and a barn and cast-iron oval vents in a masonry foundation traditionally helped air circulate.

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57

HEATING, VENTILATING AND AIR CONDITIONING (HVAC) AND AIR CIRCULATION

RECOMMENDED	NOT RECOMMENDED
Supplementing the efficiency of HVAC systems with less energy-intensive measures, such as programmable thermostats, attic and ceiling fans, louvers and vents, where appropriate.	
Retaining or installing high efficiency, ductless air conditioners when appropriate, which may be a more sensitive approach than installing a new, ducted, central air-conditioning system that may damage historic building material.	Installing through-the-wall air conditioners, which damages historic material and negatively impacts the building's historic character.
	Installing a central HVAC system in a manner that damages historic building material.

60

Recommended: [60] Original radiators that are still functional and efficient were retained in the rehabilitation of this historic house.

58

Recommended: [58] Ceiling fans enhance the efficiency of HVAC systems in historic buildings.

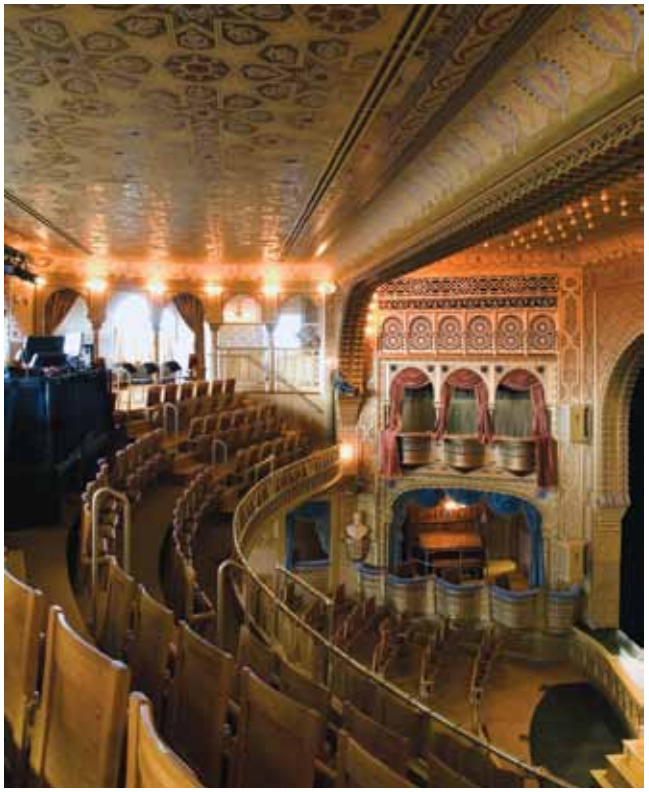
59

Recommended: [59] Installing a programmable thermostat can help existing systems to operate more efficiently.

61

Not Recommended: [61] The cuts made in the brick and the decorative stone trim to install through-the-wall air conditioners have not only destroyed building material, but have also negatively impacted the character of this historic apartment building.

62



HEATING, VENTILATING AND AIR CONDITIONING (HVAC) AND AIR CIRCULATION

RECOMMENDED	NOT RECOMMENDED
Installing new mechanical ductwork sensitively or using a mini-duct system, so that ducts are not visible from the exterior and do not adversely impact the historic character of the interior space.	Installing new mechanical ductwork that is visible from the exterior or adversely impacts the historic character of the interior space.
Leaving interior ductwork exposed where appropriate, such as in industrial spaces, or when concealing the ductwork would destroy historic fabric.	Leaving interior ductwork exposed in highly-finished spaces where it would negatively impact the historic character of the space.
Leaving interior ductwork exposed and painting it, when concealing it would negatively impact historic fabric, such as a historic pressed metal ceiling.	Leaving exposed ductwork unpainted in finished interior spaces, such as those with a pressed metal ceiling.
Placing HVAC equipment where it will operate effectively and efficiently and be minimally visible and will not negatively impact the historic character of the building or its site.	Placing HVAC equipment in highly-visible locations on the roof or on the site where it will negatively impact the historic character of the building or its site.

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Recommended: [62-63] Carefully installed new mechanical ductwork is barely visible in the elaborately decorated ceiling of this historic theater.
[64] The ductwork has been left unpainted which is compatible with this historic industrial interior.
[65] To avoid damaging the metal ceiling, the ductwork was left exposed and it was painted to minimize its impact, thus preserving the historic character of this former bank.

66

Not Recommended: [66] Interior ductwork has been inappropriately left exposed and unpainted here in this traditionally-finished school entrance hall.

HEATING, VENTILATING AND AIR CONDITIONING (HVAC) AND AIR CIRCULATION

RECOMMENDED	NOT RECOMMENDED
Commissioning or examining the performance of the HVAC system and continuing to examine it regularly to ensure that it is operating efficiently.	Installing a new HVAC system without commissioning or testing its efficiency after installation.
Investigating whether a geothermal heat pump will enhance the heating and cooling efficiency of the building before installing one.	Installing a geothermal heat pump without evidence that it will improve the heating and cooling efficiency of the building.
	Installing a geothermal system where there is a significant landscape or where there are archeological resources that could be damaged.

67

Recommended:[67] A professional energy auditor analyzes the performance of an existing furnace to ensure it is operating efficiently.

[68-69] A geothermal system, evidenced by a panel in the sidewalk, was installed on the site of this historic firehouse during rehabilitation.

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Recommended: [70-71] A geothermal system was installed on the property of this historic mansion, but only after an archeological investigation was conducted of the grounds.

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69

SOLAR TECHNOLOGY

RECOMMENDED	NOT RECOMMENDED
Considering on-site, solar technology only after implementing all appropriate treatments to improve energy efficiency of the building, which often have greater life-cycle cost benefit than on-site renewable energy.	Installing on-site, solar technology without first implementing all appropriate treatments to the building to improve its energy efficiency.
Analyzing whether solar technology can be used successfully and will benefit a historic building without compromising its character or the character of the site or the surrounding historic district.	Installing a solar device without first analyzing its potential benefit or whether it will negatively impact the character of the historic building or site or the surrounding historic district.
Installing a solar device in a compatible location on the site or on a non-historic building or addition where it will have minimal impact on the historic building and its site.	Placing a solar device in a highly-visible location where it will negatively impact the historic building and its site.
Installing a solar device on the historic building only after other locations have been investigated and determined infeasible.	Installing a solar device on the historic building without first considering other locations.

72

73

Recommended: [72-73] Solar panels were installed appropriately on the rear portion of the roof on this historic row house that are not visible from the primary elevation.

74

Recommended: [74] Free-standing solar panels have been installed here that are visible but appropriately located at the rear of the property and compatible with the character of this industrial site.

75

Not Recommended: [75] Solar roof panels have been installed at the rear, but because the house is situated on a corner, they are highly visible and negatively impact the character of the historic property.

SOLAR TECHNOLOGY

RECOMMENDED	NOT RECOMMENDED
Installing a low-profile solar device on the historic building so that it is not visible or only minimally visible from the public right of way: for example, on a flat roof and set back to take advantage of a parapet or other roof feature to screen solar panels from view; or on a secondary slope of a roof, out of view from the public right of way.	Installing a solar device in a prominent location on the building where it will negatively impact its historic character.
Installing a solar device on the historic building in a manner that does not damage historic roofing material or negatively impact the building's historic character and is reversible.	Installing a solar device on the historic building in a manner that damages historic roofing material or replaces it with an incompatible material and is not reversible.
	Removing historic roof features to install solar panels.
	Altering a historic, character-defining roof slope to install solar panels.
	Installing solar devices that are not reversible.
Installing solar roof panels horizontally -- flat or parallel to the roof—to reduce visibility.	Placing solar roof panels vertically where they are highly visible and will negatively impact the historic character of the building.

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Not Recommended: [79] Although installing solar panels behind a rear parking lot might be a suitable location in many cases, here the panels negatively impact the historic property on which they are located.

Recommended: [76-77] Solar panels, which also serve as awnings, were installed in secondary locations on the side and rear of this historic post office and cannot be seen from the front of the building. [78] Solar panels placed horizontally on the roof of this historic building are not visible from below.

78

WIND POWER—WIND TURBINES AND WINDMILLS

RECOMMENDED	NOT RECOMMENDED
Considering on-site, wind-power technology only after implementing all appropriate treatments to the building to improve energy efficiency, which often have greater life-cycle cost benefit than on-site renewable energy.	Installing on-site, wind-power technology, without first implementing all appropriate treatments to the building to improve energy efficiency.
Analyzing whether wind-power technology can be used successfully and will benefit a historic building without compromising its character or the character of the site or the surrounding historic district.	Installing wind-powered equipment without first analyzing its potential benefit or whether it will negatively impact the character of the historic building or the site or the surrounding historic district.
Installing wind-powered equipment in an appropriate location on the site or on a non-historic building or addition where it will not negatively impact the historic character of the building, the site or the surrounding historic district.	Placing wind-powered equipment on the site where it is highly visible when it is not compatible with the historic character of the site.

80

Recommended: [80] It is often best to install wind-powered equipment in off-site, rural locations to avoid negatively impacting a historic building and its site.

[81] This wind turbine is located in a large parking lot next to a historic manufacturing complex and it is compatible with the character of the industrial site.

[82] This 2011 Kansas postage stamp features a traditional windmill and modern wind turbines to illustrate the importance of wind power in the growth of the state.

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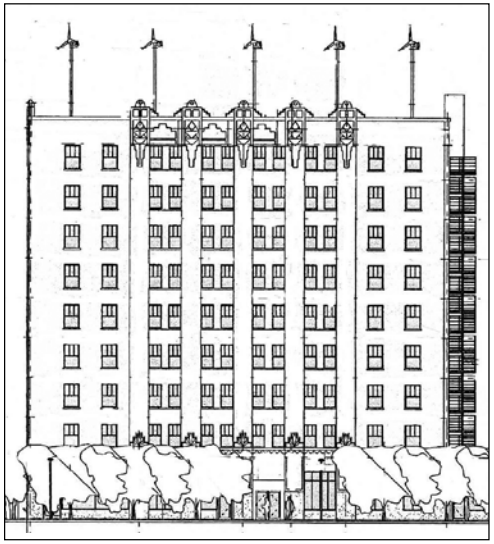
82

WIND POWER—WIND TURBINES AND WINDMILLS

RECOMMENDED	NOT RECOMMENDED
Installing wind-powered equipment on the historic building without damaging the roof or walls or otherwise negatively impacting the building's historic character.	Installing wind-powered equipment on the historic building in a manner that damages the roof, compromises its structure or negatively impacts the building's historic character.
	Removing historic roof features to install wind-powered equipment, such as wind turbines.
	Installing wind-powered equipment on the historic building that is not reversible.
	Installing wind-powered equipment on the primary façade of a historic building or where it is highly visible.
Investigating off-site, renewable energy options when installing on-site wind-power equipment would negatively impact the historic character of the building or site.	

84



83

Not Recommended:
[83-84] This historic hotel is a prominent and highly visible local landmark, and the wind turbines proposed to be added on the roof would negatively impact its historic character.

ROOFS—COOL ROOFS AND GREEN ROOFS

RECOMMENDED	NOT RECOMMENDED
Retaining and repairing durable, character-defining historic roofing materials in good condition.	Replacing durable, character-defining historic roofing materials in good condition with a roofing material perceived as more sustainable.
Analyzing whether a cool roof or a green roof is appropriate for the historic building.	
Installing a cool roof or a green roof on a flat-roofed historic building where it will not be visible from the public right of way and will not negatively impact the building's historic character.	Installing a cool roof or a green roof without considering whether it will be highly visible from the public right of way and will negatively impact the building's historic character.
Selecting appropriate roofing materials and colors when putting a new cool roof on the historic building.	Installing a cool roof that is incompatible in material or color with the historic building.
Ensuring that the historic building can structurally accommodate the added weight of a green roof and sensitively improving the structural capacity, if necessary.	Adding a green roof that would be too heavy and would damage the historic building or supplementing the structural capacity of the historic building in an insensitive manner.

85

86

Recommended: [85-86] A cool or green roof is best installed on a flat roof where it cannot be seen from the public right of way and will not negatively impact the character of the historic building.

87

Not Recommended: [87] Historic roofing materials in good condition should be retained rather than replaced with another material perceived as more sustainable, such as, in this case, solar roofing shingles.

88

Not Recommended: [88] This new, cool white metal roof is not an appropriate material or color for this historic mid-20th century house.

ROOFS—COOL ROOFS AND GREEN ROOFS

RECOMMENDED	NOT RECOMMENDED
Ensuring that the roof is water tight and that roof drains, gutters and downspouts function properly before installing a green roof.	Installing a green roof without ensuring that the roof covering is water tight and that drainage systems function properly.
Including a moisture-monitoring system when installing a green roof to protect the historic building from added moisture and accidental leakage.	
Selecting sustainable native plants that are drought resistant and will not require excessive watering of a green roof.	
Selecting appropriately-scaled vegetation for a green roof that will not grow so tall that it will be visible and detract from the building's historic character.	Selecting vegetation for a green roof that will be visible above the roof or parapet.

89

90-91

Recommended: [89-92] Low-scale and sustainable native plants are appropriate for these roof gardens on historic buildings.

93

Not Recommended: [93] The vegetation on these green roofs has grown too tall and negatively impacts the character of these historic commercial buildings.

92

94

95

Recommended: [94-95] Permeable pavers were used at this historic residential property for a driveway and parking (above) and a hard-packed, construction aggregate provides environmentally-friendly paths for visitors at this historic site (below).

[96] Mature trees and a water feature contribute to the sustainability of this mid-twentieth century property.

SITE FEATURES AND WATER EFFICIENCY

RECOMMENDED	NOT RECOMMENDED
Respecting an important cultural landscape and significant character-defining site features when considering adding new sustainable features to the site.	Installing new sustainable site features without considering their potentially negative impact on an important cultural landscape and character-defining site features.
Using to advantage existing storm-water-management features, such as gutters, downspouts and cisterns, as well as site topography and vegetation that contribute to the sustainability of the historic property.	Ignoring existing features that contribute to the sustainability of the historic property.
Adding natural, sustainable features to the site, such as shade trees, if appropriate, to reduce cooling loads for the historic building.	Removing existing natural features, such as shade trees, that contribute to the building's sustainability.
	Planting trees where they may grow to encroach upon or damage the historic building.
Using permeable paving where appropriate on a historic building site to manage storm water.	

96

97

Not Recommended: [97] This tree, which was planted too close to the building, has caused the masonry wall to retain moisture that damaged the mortar and required that the brick be repointed in this area.

SITE FEATURES AND WATER EFFICIENCY

RECOMMENDED	NOT RECOMMENDED
Avoiding paving up to the building foundation to reduce heat island effect, building temperature, damage to the foundation and storm-water runoff.	Paving up to the building foundation with impermeable materials.
Landscaping with native plants, if appropriate, to enhance the sustainability of the historic site.	Introducing non-native plant species to the historic site that are not sustainable.
Adding features, such as bioswales, rain gardens, rain barrels, large collection tanks and cisterns, if compatible, to the historic building site to enhance storm-water management and on-site water reuse.	

98

99

Recommended: [98-100] Rain gardens and rain-water collection tanks are features that may be added to a historic property to improve storm-water management and increase on-site water use.

100

101

Not Recommended: [101] Splash back from the impermeable concrete paving next to the foundation is damaging these stones.

102

Recommended: [102-103]
Small, covered atriums that are compatible with the character of these historic warehouses have been inserted to light the interior.

103

Not Recommended: [104-106]
Skylights added on a primary roof elevation negatively impact the character of these historic houses.

104

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106

DAYLIGHTING

RECOMMENDED	NOT RECOMMENDED
Retaining features that provide natural light to corridors, such as partial glass partitions, glazed doors and transoms, commonly found in historic office buildings.	Removing or covering features that provide natural light to corridors, such as partial glass partitions, glazed doors and transoms, commonly found in historic office buildings.
Reopening historic windows that have been blocked in to add natural light and ventilation.	Blocking in historic window openings to accommodate new building uses.
Adding skylights or dormers on secondary roof elevations where they are not visible or are only minimally visible so that they do not negatively impact the building's historic character.	Adding skylights or dormers on primary or highly-visible roof elevations where they will negatively impact the building's historic character.
Adding a small light well or light tubes, where necessary and appropriate, to allow more daylight into the historic building.	
Inserting a small atrium, only when necessary, to allow more daylight into the building in a manner that is compatible with the historic character of the building.	Cutting a very large atrium into the historic building that is not compatible with the building's historic character.
	Creating an open, uncovered atrium or courtyard in the historic building that appears to be an outdoor space, rather than an interior space.

DAYLIGHTING

RECOMMENDED	NOT RECOMMENDED
Installing light-control devices on the historic building where appropriate to the building type, such as light shelves in industrial or mid-century modern buildings, awnings on some commercial and residential buildings and shutters on residential buildings that had them historically.	Installing light-control devices that are incompatible with the type or style of the historic building.
Installing automated daylighting controls on interior lighting systems that ensure adequate indoor lighting and allow for energy-saving use of daylighting.	
Adding new window openings on secondary and less visible facades, where appropriate, to allow more natural light into the historic building.	Adding new window openings on primary elevations that will negatively impact the character of the historic building.

107

Recommended: [107] Traditional canopies compatible with the industrial character of this former factory building were installed when it was converted for residential use.

[108-109] The original, partially-glazed doors and office partitions, as well as skylights, that let natural light into the corridors were retained as part of the rehabilitation of this early-20th century building.

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Recommended: [110] A clerestory window lights the interior corridor of this historic mill building.

[111] A limited number of new window openings may be added to non-character-defining, secondary facades to allow natural light into formerly windowless spaces.

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