



City of Newton Historic Preservation

GUIDELINES FOR SUSTAINABILITY



The renovation of this house in a National Register district recently received a LEED-Gold certification from the US Green Building Council.

PURPOSE

These *Guidelines* were prepared to inform property owners on how sustainability relates to the repair, alteration, or rehabilitation of an existing building. They are not intended to replace consultation with qualified architects, contractors, the Newton Historical Commission (NHC), Local Historic District Commissions (HDC) and their Staff. The City's Preservation Planner and the NHC/HDC will be happy to provide a preliminary consultation to potential applicants free of charge.

These *Guidelines* were developed in conjunction with the City of Newton's Historical Commission (NHC), Local Historic Districts Commissions (HDC), and the Planning and Development Department (PDD). Familiarity with this material can assist owners of designated historic properties to move a project quickly through the City of Newton review and approval process. Information pertaining to all properties with a City of Newton historic preservation review designation is marked with the abbreviation **(ALL)**. Information pertaining specifically to properties in Local Historic Districts **(LHD)**, to Local Landmarks **(LL)**, or to properties with Preservation Restrictions **(PR)** is marked accordingly. Information in the Guidelines that is advisory only is marked with the abbreviation **(AO)**. Please refer to the Introduction section for background information on historic preservation designations and the project review process in the City of Newton.

Additional Guidelines addressing other historic preservation topics are available at City Hall and on the City's website at www.newtonma.gov. The NHC, HDC, and PDD are available to provide informational meetings or preliminary consultation with applicants prior to filing. For more information, questions regarding the application process, or to clarify whether a project requires review please contact the PDD at (617) 796-1120.

SUSTAINABILITY

In the most general sense, "sustainability" is the concept of meeting current needs in a way that can be continued in the long-term, without jeopardizing the ability of future generations to also meet their needs. The goals and ideals of sustainable planning and design can be thought of in three major categories:

- **Environmental:** Protecting the natural environment and using resources and energy in a sustainable way
- **Social:** Promoting social equality while enriching and protecting important elements of our culture
- **Economic:** Providing equal economic opportunity and considering the full life-cycle impacts of current decisions

SUSTAINABILITY & PRESERVATION (AO)

Historic buildings have significant inherent advantages when considered in the context of sustainability:

- By reusing an existing structure, the investment of natural resources in the original construction can be reclaimed, a concept known as "embodied energy"
- Buildings constructed prior to WWII were often designed to take advantage of natural sources of heating, cooling, ventilation and lighting
- Historic buildings commonly used more regional materials, with lower transportation and life-cycle costs
- Historic building materials are generally easier to repair when compared with modern materials, which are intended to be replaced frequently rather than repaired
- The preservation of historic buildings and sites plays a key role in the protection of cultural resources and community character, promoting social sustainability

When property owners are contemplating how sustainability principles can be incorporated in their historic property, the following approach should be considered:

- Rather than a "piecemeal" approach, interventions should be planned on a whole-building/site basis, even if they will be implemented in phases
- Sustainability upgrades to historic buildings and sites should always be considered in relation to their impact on the historic fabric and character
- Upgrades and sustainable features should always be planned with first priority given to least-impact options
- Small improvements, such as weatherization, insulation, and maintenance and operations improvements, can have a big impact at a relatively low cost

WEATHERIZATION (AO)

One of the most effective ways of increasing the energy efficiency of a historic building is to limit air infiltration and movement (“drafts”) through the exterior envelope, specifically at windows, doors and changes in materials. If proper measures are taken, traditional assemblies such as historic wood windows and doors can meet or exceed the energy efficiency of modern replacements.

The NHC / HDC encourage:

- Planning the weatherization of historic assemblies for the overall building before beginning any work
- Addressing air infiltration through a building’s historic envelope as one of the first steps in improving a building’s energy efficiency

(For more details on weatherization, refer to the *Guidelines for Windows and Doors*, Page 12.)



Well-designed wood exterior storm windows can provide protection and improve thermal efficiency for historic windows without compromising their appearance or historic character. This wood storm window is the same size and shape as the original window opening and the horizontal divider aligns with the central meeting rail.

INSULATION (AO)

Given Newton’s climate, insufficient missing insulation in the exterior envelope can be an issue in some historic buildings, particularly in wood-frame construction. In some homes, previous owners may have installed insulation improperly, leading to moisture issues. Properly installed insulation materials can enhance the energy efficiency of a historic home, without causing long-term, moisture-related problems.

The NHC / HDC encourage:

- Understanding a building’s materials and actual insulation needs before adding or replacing insulation
- Insulating unfinished spaces, such as basements or attics, before finished spaces
- Using the appropriate type of insulation for each specific area of the building (roof, walls, eaves) and using reversible insulation materials wherever possible
- Installing insulation on/from the interior of a historic building, to avoid altering the exterior appearance

The NHC / HDC discourage:

- Installing insulation in a manner that results in unnecessary damage or loss of historic fabric

WINDOWS & DOORS

Historic wood windows and doors are often the first building elements targeted when homeowners are planning to increase the energy efficiency of their property. Despite the literature published by new window manufacturers, historic wood windows and doors - if properly weatherized - can meet or exceed the energy efficiency of modern replacements.

The NHC / HDC encourage:

- Maintaining existing windows to ensure that they remain operable as a source of natural ventilation (ALL)
- Weather stripping and caulking historic windows to improve energy efficiency (AO)
- Using reversible methods/products such as transparent UV films, where appropriate, before resorting to severe interventions such as replacement glazing (ALL)
- Installing interior or exterior storm windows that are compatible with the appearance of the historic windows (PR/LL)
- When window replacement is required, installing windows that match the appearance and design of the historic windows while meeting energy-efficiency goals (ALL)
- Maintaining and utilizing historic operable shutters and awnings, or installing new historically-appropriate shutters or awnings to improve energy-efficiency (ALL)

The NHC / HDC discourage:

- Replacing repairable historic windows in the name of improved energy efficiency (ALL)

(For more information regarding historic windows and doors, refer to the *Guidelines for Windows and Doors*.)

PLANNING YOUR PROJECT

When undertaking measures to increase the energy efficiency of a historic building, or when considering the energy efficiency of planned repairs, careful planning and forethought can prevent unforeseen issues and unintended negative consequences. DPD Staff are available to discuss a planned project, and can provide guidance regarding sustainability issues. Hiring an architect or preservation professional is highly recommended for complex or substantial projects involving multiple building systems or elements.

ENERGY AUDIT

Property owners should consider an overall approach to energy efficiency before undertaking any work. An energy audit can identify the efficiency of existing assemblies and potential upgrades as a first key step in this process. With an overall plan in place, specific smaller projects can be undertaken in an efficient way, without jeopardizing the desired final outcome or historic integrity of the building or site. Property owners should consult their local utility company regarding energy audits and energy efficiency incentives; many have services and tips for homeowners.



Installing window air-conditioning units in historic buildings is not encouraged, due to their appearance, likelihood of damaging windows and frames, and low efficiency.

HEATING, VENTILATION & AIR CONDITIONING (HVAC)

Installation or improvement of a building's HVAC systems can provide significant upgrades in energy efficiency, but they must be carefully designed and planned. An improperly designed HVAC system installed in a historic building can damage significant historic fabric, cause moisture-infiltration issues and be uneconomical.

The NHC / HDC encourage (AO):

- Maintaining existing HVAC systems to ensure proper and efficient operation
- Incorporating incremental measures such as programmable thermostats, ceiling fans and properly located vents into existing HVAC systems
- Using a "zoned" HVAC system to reduce energy costs
- Taking into account whole-building performance when designing a replacement or upgrade to an HVAC system
- Upgrading obsolete HVAC equipment with more efficient systems in a way that is sensitive to the historic building
- Considering HVAC systems specifically designed for existing buildings, such as high-velocity systems with small ducts, to minimize the impact on historic fabric
- Locating HVAC equipment to the rear of a property to minimize impacts on the historic character of the building and/or streetscape

The NHC / HDC discourage:

- Installing through-wall air-conditioning units (ALL)
- Installing window air-conditioning units (AO)

DEFINITIONS:

Energy Audit: An assessment that uses a variety of techniques and equipment to determine the energy efficiency of a structure and HVAC systems, and makes recommendations for increasing energy efficiency

Geothermal Heating/Cooling: General term for HVAC systems that use the thermal energy generated and stored in the Earth to heat/cool a building

VOC: Volatile Organic Compounds, which are generally harmful to human health when introduced into the air

Bioswale: A landscape element designed to remove particles from stormwater and slow stormwater runoff

ALTERNATIVE ENERGY SOURCES (ALL)

In exploring the use of alternative energy technologies in historic buildings, including solar power and geothermal heating/cooling, it is important to consider how proper installation and selection of systems can improve energy-efficiency without adversely affecting a building's historic character.

The NHC / HDC encourage:

- Minimizing impacts on the historic fabric and appearance of a building when installing modern equipment such as solar panels (*Refer to Guidelines for Roofing, Page 7*)
- Investigating whether a geothermal system can improve the energy-efficiency of a building's HVAC system (AO)

The NHC / HDC discourage:

- Installing modern equipment in a manner that is not reversible or adversely affects the historic building



Green roofs are becoming increasingly common in new construction, providing both an insulating layer of soil and reduced stormwater runoff. They may be an energy-upgrade option for historic structures with flat roofs and sufficient structural capacity.

ROOFING (ALL)

Installation of cool (i.e., reflective) roofing and green roofs are becoming increasingly common as an energy-efficiency measure. However, for historic buildings, the selection of a new roof system must take into account the historic character of the building.

The NHC / HDC encourage:

- Using cool-roof and green-roof technologies, when appropriate, in areas that are not visible from the public right-of-way, and in ways that do not adversely impact the appearance, structure, or moisture-performance of a historic structure

(For more information, refer to the *Guidelines for Roofing*.)

INDOOR AIR QUALITY (AO)

An important component of sustainable design is the human environment, including provisions for indoor air quality and natural lighting.

The NHC / HDC encourage:

- The use of low-VOC materials, household cleaners, carpeting and paint
- Maintaining or restoring historic design features - such as glazed transoms and operable windows - that provide natural light and air circulation



Sustainable site features - such as this permeable parking surface in Auburndale - can contribute to the overall sustainability of a property.

SITE FEATURES (AO)

In addition to upgrades to the historic building itself, proper design of the site can contribute to a property owner's energy-efficiency and water conservation goals.

The NHC / HDC encourage:

- Considering the historic character and landscape of a site before installing any new site features
- Utilizing existing site features - such as shade trees, cisterns and topography - to maximize energy efficiency and conserve water
- When compatible with a historic property, installing sustainable features such as bioswales, rain barrels and cisterns
- Minimizing new site features with adverse impacts, such as impervious paving

The NHC / HDC discourage:

- Introducing non-native plant species to a site, resulting in increased water-use or requiring pesticides
- Installing new trees or plantings where they may damage the historic building

The Guidelines project has been financed in part with Federal funds from the National Park Service, U.S. Department of the Interior, through the Massachusetts Historical Commission, Secretary of the Commonwealth William Francis Galvin, Chairman. However, the contents and opinions do not necessarily reflect the views or policies of the Department of the Interior, or the Massachusetts Historical Commission, nor does the mention of trade names or commercial products constitute endorsement or recommendation by the Department of the Interior, or the Massachusetts Historical Commission. This program receives Federal financial assistance for identification and protection of historic properties. Under Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, and the Age Discrimination Act of 1975, as amended, the U.S. Department of the Interior prohibits discrimination on the basis of race, color, national origin, disability or age in its federally assisted programs. If you believe you have been discriminated against in any program, activity, or facility as described above, or if you desire further information, please write to: Office for Equal Opportunity, National Park Service, 1849 C Street NW, Washington, DC 20240.

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ADDITIONAL INFORMATION

These *Guidelines* summarize the important considerations for the sustainable preservation of historic buildings in Newton. For more detailed information, refer to the *Preservation Resources* in the *Guidelines Introduction, Page 23*.



Many historic structures, such as this former industrial building in Newton Upper Falls, include numerous large windows that allow natural light and ventilation for the interior.

MAINTENANCE & OPERATIONS (AO)

The principles and approach described in this section can assist in the sustainable design of alterations and repairs. However, the long-term maintenance and operation of a historic building or property can have a significant impact on the environment.

The NHC / HDC encourage:

- Recycling unused and demolished building materials, as well as everyday products such as paper, plastic and glass
- Using the gentlest effective cleaning methods available for both household use and for exterior building maintenance, rather than harsh chemical cleaners
- Using natural, low-impact materials such as sand for de-icing walkways, paths and driveways, rather than salt or harsh chemical de-icing agents
- Using energy efficient appliances, equipment and lighting