August 2025

Marblehead Sustainable Heritage:

Proposed Recommendations for Clean Energy Retrofits in the Old and Historic Districts

Marblehead Sustainable Heritage

Table of Contents

Purpose of the Proposed Recommendations

The purpose of providing Marblehead with recommendations for guidelines on Old and Historic Districts Commission (OHDC) review of integration of sustainable technologies into buildings inside the Old and Historic District is to ensure that (1) the OHDC and the public have clarity about preservation standards applied to the review process and consistency in the application of those standards; (2) that residents have pathways to align their improvements to property within the OHDC jurisdiction in alignment with state and local climate commitments; and (3) to advance a shared vision for Marblehead that balances preservation with sustainability.

1. Provide Clarity and Consistency in Preservation Standards

The current publicly available guidelines offer limited direction for members of the Old and Historic Districts Commission to evaluate applications for clean energy retrofits in a consistent and transparent manner. This has contributed to a cautious approach that has led to few, if any, approvals for sustainable technologies such as solar panels, heat pumps, insulated windows, and electric vehicle charging. In addition, the current guidelines outright restrict certain interventions and give the Commission broad discretion to determine that an intervention is inappropriate. This has resulted in confusion among property owners about how to integrate sustainable technologies within OHDC guidelines, added expenses resulting from OHDC decisions, and growing tension and frustration within the community. The recommended guidelines would clarify what applications of sustainable technologies in OHDC are allowable and ensure more consistent review of applications to OHDC.

2. Align with Local and State Climate Commitments

There is strong support from residents in aligning their homes with Town and State Greenhouse Gas reduction goals. From the 2019 Marblehead Climate Vision report: “In 2018, Town Meeting voters approved Article 45, affirming, ‘That the Town supports a goal of using 100% carbon-free energy in Marblehead, including in electricity production, building energy use and transportation.’” In 2017 GHG inventory, residential buildings made up 44.5% of GHG emissions in the town, with vehicles making up an additional 36.2% of emissions (Marblehead Net Zero Roadmap).

To meet the Towns Net Zero goals, the community must improve energy efficiency of buildings, while electrifying and decarbonizing buildings. The sustainable technologies included among the recommendations are critical to meeting

these goals, while also providing residents with pathways to save on energy costs. The recommended guidelines would offer a pathway to meeting this goal for buildings in the OHDC jurisdiction.

3. Advance Shared Goals and Vision for Sustainable Marblehead

Residents of Marblehead are proud of the Town's history and historic character and are committed to a sustainable, net-zero future. Preserving Marblehead's historic neighborhoods as a cultural resource need not be incompatible with ensuring its sustainable future. The recommended guidelines and guiding principles ensure that preservation and sustainability priorities can be balanced in decisions made by the OHDC. The recommendations are framed around the question of how clean energy retrofits can be thoughtfully integrated into historic properties. This framing expands the possibility of creative, preservation-sensitive solutions to sustainability and encourages residents to explore sustainable upgrades. It is also in alignment with national historic preservation best practices.

Guiding Principles

The proposed recommendations were developed to align with national historic preservation best practices, including the Secretary of the Interior's *Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings* and guidance from the Advisory Council on Historic Preservation. These best practices can be summarized by the following three guiding principles: [1]

Reversibility — Reversibility refers to the ability to undo or remove any changes or additions made to a historic property without causing damage to the original historic fabric. Any modifications should be designed and implemented in a way that allows them to be removed in the future, returning the building to its previous state.

Distinguishability — Distinguishability means that any new additions or alterations to a historic property should be visually distinct from the original historic elements. While new work should be compatible with the historic character, it should not attempt to create a false sense of history by exactly mimicking original features. This allows observers to clearly differentiate between historic fabric and contemporary interventions.

Scale — Scale refers to maintaining appropriate proportions and sizes for any new elements added to a historic property. New additions or alterations should be designed at a scale that is compatible with and does not overwhelm the existing historic structure. This principle helps preserve the visual integrity and character-defining features of the historic property.

1 National Park Service. 1993. Preservation Brief 32: Making Historic Properties Accessible. Washington, D.C.: U.S. Department of the Interior. https://www.nps.gov/orgs/1739/upload/preservation-brief-32-accessibility.pdf

Recommended Use of the Proposed Recommendations

The following proposed recommendations are intended to replace four existing topic-specific sections of the current OHDC Guidelines, Solar Energy, HVAC & Mechanical Systems, EV Charging, and Windows, with clearer, more current standards that better align with both historic preservation best practices and local climate goals. The recommended guidelines reflect the goals and guiding principles of the project, as defined by the Marblehead community, and best practices in integrating sustainability and historic preservation considerations. While the OHDC may choose to modify the recommended language to better align with existing practices and the character-defining features of the districts, any changes should not make it more difficult for residents and property owners to install clean energy technologies.

Proposed Recommendation 1: Solar Energy Systems

Replace existing "Solar Energy" section of current guidelines with the below language:

Definition of Solar Energy Systems

Solar energy systems (SES) are a device or an array of devices that provide generation or storage of electricity from sunlight in the case of solar photovoltaics, or the collection, storage and distribution of solar energy for the purposes of space heating or cooling or water heating. SES, including but not limited to solar panels, solar shingles, and all accessory equipment, are allowed in the historic district. It is preferable for SES to be placed on non-historic accessory buildings or additions. If that is not possible, SES may be placed on historic buildings. Applicants must complete a roof framing assessment to ensure structural integrity and submit it as supporting documentation with their Certificate of Appropriateness application.

Location of SES

Where practicable, SES on historic buildings should be installed on secondary elevations, set back on flat roofs, and/or placed in other locations not easily visible from the Public Way. Solar installations should be located away from roof edges and ridges so there is a visual distinction between the building roof and the solar device. Where practicable, SESs should be positioned behind architectural features like parapets, dormers, and chimneys to limit visibility from the primary public way. SES should not significantly alter the profile of the building.

Visual Considerations

The color and reflectivity of SES on historic buildings should be compatible with existing and/or historically appropriate roofing materials. On sloped roofs, solar panels should be low-profile, set flush with the roof, and set back from the edge of the roof to minimize visual impact. On flat roofs, SES are not required to be flush with the roof but cannot protrude more than 45 degrees from the roof plane and three feet in height. Architecturally integrated solar systems (such as solar shingles) should match the historic size and pattern of historically appropriate roofing materials as closely as possible.

Reversibility

SES on historic buildings should be designed and installed to ensure that if removed in the future, there will be minimal impact to the building's historic features and materials. Removing, covering, or altering significant or character-defining features of a building to accommodate SES, including roof slopes, dormers, chimneys, windows, and exterior wood and masonry walls, is discouraged.

Proposed Recommendation 2: Air Source Heat Pumps

Replace existing "HVAC & Mechanical Equipment" section of current guidelines with the below language:

Definition of Air Source Heat Pumps

Air Source Heat Pumps (ASHP) are defined as electrical equipment used for heating, ventilation, and air conditioning that supply space heating and/or cooling to a building. Air source heat pumps use one or more outdoor units (typically located on the exterior of a building) to exchange heat with the outdoor air which are connected using refrigerant lines to one or more indoor units to deliver heated and cooled air. ASHP include, but are not limited to, centrally ducted air source heat pumps, ductless mini-split systems, variable refrigerant flow systems, and air-to-water heat pumps.

Location of ASHP

Wherever possible, ASHP equipment should be installed at the rear of the building and/or on rear elevations in locations not visible from the Public Way. Accessory equipment should be installed to minimize visibility from the Public Way. As technology evolves, equipment should be installed to minimize visibility. Exterior components should be placed at grade to reduce visual intrusion unless it is required to be elevated due to flood risks, snow accumulation, and other environmental risks to mechanical and electrical performance and safety.

Freestanding Exterior Mechanical Equipment of ASHP

Town of Marblehead bylaw §200-28 requires all freestanding exterior mechanical equipment, including but not limited to air conditioning units, compressors, condensers, and fans, to be visually screened, regardless of visibility from the Public Way.

ASHP Equipment and Line Sets

Equipment and line sets (e.g., pipes, conduits, cables, covers) can be routed through interior spaces. When placed on the exterior, they should be positioned in less-visible areas and arranged to avoid obscuring architectural features. Equipment and line sets shall be painted to blend with exterior walls, reducing the overall visual impact. Horizontal pipes may be placed along the bottom edge of the wall, or if necessary, along the roofline. When visibility cannot be fully eliminated, set the installation back from the street and minimize its presence. Limit wall penetration and use the least invasive installation methods to allow future reversibility.

Proposed Recommendation 3: Electric Vehicle Supply Equipment

Replace existing "EV Charging" section of current guidelines with the below language:

Definition of Electric Vehicle Supply Equipment

Electric Vehicle Supply Equipment (EVSE) refers to equipment for the purpose of transferring electric energy to a battery or other energy storage device in an electric vehicle in order to recharge the vehicle. Most EVSE consists of a charging station and cord that connects the electric vehicle to the charging station. Applicants are encouraged to use the least visually noticeable equipment reasonably available that provides the necessary charging capacity. These proposed recommendations apply solely to residential properties such as single-family homes and multi-unit dwellings.

Ground-Mounted and Wall-Mounted Charging Stations

Whenever feasible, ground-mounted and wall-mounted charging stations should be installed in locations that already have existing utility connections and are designated for vehicle parking, such as driveways, garages, or shared parking areas. The preferred order for placement is:

- Rear Elevation: Install EVSE on or at the rear elevation of the building and appropriately screen it to minimize visibility from the Public Way.
- Side Elevation: If rear installation is not feasible, EVSE may be placed on or at side elevations, and should be appropriately screened to minimize visibility from the Public Way.
- Front Elevation/Facade: EVSE should not be placed on or at the front elevation/facade. The Commission may make exceptions to this guideline, based on existing locations of electrical infrastructure and driveway design.

Both ground-mounted and wall-mounted installations should avoid obscuring architectural features like drip caps, molding, and corner boards and minimize visibility from the Public Way.

Visual Impact Considerations

The visual impact of charging stations should be minimized by using smaller, less obtrusive charging units and avoiding large, bulky installations that could detract from the historic character of the property. EVSE should be installed in such a way that they can be removed without causing permanent damage to the historic property.

EVSE Screening

Materials used for EVSE screening should be compatible with the historic materials of the surrounding environment. This means using colors, textures, and finishes that blend with or complement the existing historic materials. Screening may be painted to match the building or use a natural color that blends with the landscaping, depending on which approach results in lower visibility. Other materials or treatments that achieve a similar visual effect may also be appropriate.

Proposed Recommendation 4: Windows

Replace existing "Windows" section of current guidelines with the below language:

Repair, Reuse, and In-Kind Replacement of Historic Windows

The repair and reuse of historic windows is the most appropriate treatment, followed by in-kind replacement. Where one component of a window is deteriorated or broken, repair or replace the individual piece rather than replacing the entire window unit. Repair or selectively replace in-kind existing hardware to ensure window operability, including sash cords, weights, and pulleys. If replacing a single window on an elevation, replicate the existing windows of that elevation.

Weatherization of Historic Windows

Before replacing windows, consider weatherization improvements that have minimal impact to historic fabric including sealing or recaulking around exterior and interior trim, installing weatherstripping, and installing storm windows (either exterior or interior). If traditional weather-stripping exists, it should be replaced in kind. If it does not, then weather-stripping may be installed as needed. Generic storm windows (ex. metal "triple tracks") are not under OHDC purview; however, window manufacturer-specific screens and storm panels (ex. "energy panels") are under the Commission's purview and will require a COA. Wood storm windows are encouraged. Passive energy saving measures such as shutters and curtains are highly encouraged.

Requirements for Window Replacement Application

Applications to repair historic windows or replace window sashes with exact duplicates do not require a Certificate of Appropriateness. Such in-kind replacement must meet the following conditions: no changes in window material, grid pattern (number of divided lites) or grid width, sash widths, glass treatment (single pane), glazing dimensions, or frame type.

Applications for window replacement must include the findings of an energy audit, such as a blower door test, to provide evidence of the current window's negative impact on energy efficiency. Applicants may be asked to complete a window assessment when proposing a window replacement, demonstrating that all repair and restoration options have been considered, and that replacement is the only reasonable option.

Applicants must provide detailed information on the existing and proposed windows, including photos that show the existing window in detail, as well as "cut sheets" for the proposed replacements. The Commission may conduct a site visit to evaluate

the condition of existing windows. In making its decision, the Commission shall consider the feasibility of the following:

- Restoring the entire existing window through repairs to sashes, sills, and individual components;
- Replacing an individual sash;
- Replacing the windows with exact in-kind matches and matching the existing window layout.

Original windows may be replaced in-kind if they are deteriorated beyond feasible repair. Replacement windows should match the original as closely as possible in material, type, size, operation, profile, configuration of lites and muntins, and exterior finish and texture. Existing non-original windows should be replaced with wood or wood-like windows unless they are not historically accurate. Vinyl windows are not appropriate and will not be approved, except when replacing existing vinyl windows in kind.

Full replacement windows frequently come with head, jamb and sill framing. Framing size and configuration should be carefully considered to minimize the impact on the historic window opening. Reduction in glazing size should be avoided.

Single-Pane and Double-Pane Windows Replacement

Single-pane windows should be replaced in kind whenever possible; however, double-pane windows with simulated divided lights and spacers may be allowed on a case-by-case basis. Double-pane windows shall meet the following conditions:

- Simulated divided light muntins should be affixed to the window exterior;
- Muntins with exterior putty profiles must replicate the putty line of traditional single-glazed windows or the existing profiles found at the building;
- Metal spacers should be used between the glass, preferably in bronze or other dark color;
- Muntins should be 3/4” or 7/8” in width depending on the existing original windows or the age and style of the building when the original windows are unknown.

Reflective Glazing

Reflective glazing should be avoided. Clear (non-tinted) and non-reflective glazing and low-e coatings are appropriate. In most cases, glass panes should be vertically oriented (they should be taller, rather than wider) to be historically appropriate.

Window Trim and Decorative Elements

Deteriorated window trim or decorative elements should only be replaced as necessary to match the size, profile, and material of the original elements. For window lintels or hoods

that project from the building plane and are vulnerable to water collection, consider installation of metal drip edges to shed water away from windows. Painted aluminum is acceptable if painted to match trim. Avoid fully encasing wood features in any metal or synthetic material, as this will trap moisture and cause damage.

Window Patterns and Openings

The existing ratio of window openings to solid wall surfaces should be preserved. The historic pattern of window openings (fenestration pattern) should be retained, especially on the primary elevation. Inserting new windows into an elevation or infilling existing windows should be avoided. If creating new openings or infilling existing ones is necessary for a project, locate openings on side or rear elevations. When infilling a window, the existing trim surround and sill should be preserved, with the glazed opening filled with clapboards to maintain the building's historic character.

Acknowledgments

We recognize and appreciate the contributions of the Marblehead community and external advisors, whose input informed the development of the proposed recommendations. Their perspectives helped guide the project and strengthen its alignment with local needs and priorities.

Town of Marblehead Project Partners

Thatcher Kezer, Town Manager
Logan Casey, Sustainability Coordinator
Alex Eitler, Town Planner

Old and Historic Districts Commission

Charles Hibbard, Chair
Gary Amberik, Member
Bob Bragdon, Member
Paul Pruett, Member
Mariana Vaida, Member
Duncan Facey, Alternate Member
Michael Fuenfer, Alternate Member

Green Marblehead Implementation Committee

Lisa Wolf, Chair, Municipal Light Commission
Alex Eitler, Town Planner
Julia Ferreira, Assistant Superintendent (Schools)
Thatcher Kezer III, Town Administrator
Joseph Kowalik, Light Department General Manager
Elaine Leahy, Sustainable Marblehead
Eileen Mathieu, Sustainable Marblehead
Andrew Petty, Health Director
Alexa Singer, Select Board

Contributing Experts and Reviewers

Margaret Back, Newport Restoration Foundation
Alison Felix, Transportation Department, MAPC
Patricia Kelleher, City of Salem
Jeremy Koo, Clean Energy Department, MAPC
Elizabeth Paliga, Historic New England
Laurence Spang, Salem Historic Commission

MAPC Project Team

Project Manager: **Lindsay Randall**, Arts & Culture Department

Sarah Scott, Land Use Department

Sasha Shyduroff-Gutman, Clean Energy Department

Nubes Chen, Arts & Culture Department

Learn more about the Sustainable Heritage project in our Project Summary.