MINOR ALTERATIONS: MECHANICAL & COMMUNICATIONS EQUIPMENT

SOLAR ENERGY SYSTEMS

Solar Panels, Heat Collectors and Photovoltaic Systems

INTRODUCTION

In 2013, with *Sustainable Providence*, the City of Providence released sustainability goals to move Providence forward in six key areas: waste, food, transportation, water, energy, and land use & development. As part of the global initiative to encourage energy conservation there is a rapidly growing trend toward retrofitting homes to be more energy efficient. This has brought an increase in the number of applications for installing solar energy systems on buildings within Providence's locally designated historic districts. Specifically identified in *Sustainable Providence* is the West Side Solar program, a successful initiative to introduce solar energy to primarily historic properties in the City's West End. The success of the program has created more interest in expanding the program throughout the City. Because of ~~T~~this growing interest ~~has caused some concern by~~ the Providence Historic District Commission (PHDC) has adopted this statement on ~~as to~~ the appropriateness of allowing solar panel installations within the City's local historic districts. Of particular concern are those buildings with primary elevations that face south. The PHDC's Standards & Guidelines make the installation of publicly visible solar panels difficult to approve as such installations generally qualify as having an adverse effect on either the historic structure and/or the historic district. This is also in keeping with the National Park Service's Standards, the national guideline for historic district commissions. ~~In an effort to~~To allow both of these worthy initiatives, historic preservation and energy conservation, ~~to continue~~ the PHDC has amended their Standards & Guidelines as follows.

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 architectural 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~~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.

(NPS, *Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings*)

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.
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.
Investigating off-site, renewable energy options when installing on-site solar devices that would negatively impact the historic character of the building or site.	

(NPS, *Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings*)

GENERAL GUIDELINES for Solar Panels, Heat Collectors and Photovoltaic Systems

In the historic districts, the greatest potential for using solar panels to heat water or to generate electricity will be on buildings with large flat roofs, high parapets, or roof configurations that allow solar panels to be installed with limited or no visibility from the public rights-of-way. All solar panel installations must be considered on a ~~case-by-case~~case-by-case basis recognizing that the best option will depend on the characteristics of the property under consideration. When considering retrofitting measures, historic building owners should keep in mind that there are no permanent solutions. One can only meet the standards being applied today with today's materials and techniques. In the future, it is likely that the standards and the technologies will change and a whole new retrofitting plan may be necessary. Thus, owners of historic buildings should limit retrofitting measures to those that achieve reasonable energy savings, at reasonable costs, with the least intrusion or impact on the character of the building.

1. On buildings with a **flat roof** (historic building, non-contributing existing building, or new construction), solar panels may be located, installed at a low angle, so that they are out of view from the public right-of-way adjacent to the building. In the case where a proposal meets these requirements and has been deemed to have no adverse effect by the RI Historical Preservation & Heritage Commission (when such review is required), the PHDC review would be conducted at an administrative level by the Commission's staff. Nothing would prevent staff from forwarding the application to the full Commission for review if warranted;

2. On buildings with a **sloped roof** (historic building, non-contributing existing building, or new construction) where solar panels are to be installed on a secondary elevation, ~~not visible from the public right-of-way~~:
    A. Panel layout shall be sympathetic or appropriate to design and scale of building. Rectangular configurations are preferred, with ample setback from edge of roof, dormers, chimneys, etc.;
    B. Panels shall be installed parallel to the existing roof slope and matched as closely as possible to the roof plane;
    C. Panels shall be installed without destroying or replacing original or historic materials or significantly compromising or altering the building's structural integrity;
    D. Panels shall be compatible in color to existing roofing insofar as possible;
    E. Installation of panels shall be as inconspicuous as possible when viewed from public right-of-way;
    F. Installation shall be reversible. Panels shall be removed when no longer viable or functioning and roofing restored to pre-existing conditions; and,
    G. In the case of proposals that have been deemed to have no adverse effect by the RI Historical Preservation & Heritage Commission (when such review is required), the PHDC review would be conducted at an administrative level by the Commission's staff. Nothing would prevent staff from forwarding the application to the full Commission for review if warranted; and,

3. On buildings with a **sloped roof** (historic building, non-contributing existing building, or new construction) where solar panels are to be installed on a primary elevation, or any elevation that is highly visible from the public rights-of-ways additional factors must be taken into consideration. For most historic properties, locating solar panels on the primary elevation is the least desirable option because it will have the greatest adverse effect on the district's and property's character defining features, as well as its effect on the historic streetscape. ~~All other options should be thoroughly explored and ruled out before considering installing solar panels on a primary elevation. For the installation of solar panels on primary elevations, proof that all other elevations or locations on property are not viable or feasible for installation of solar panels is required.~~ Only installations where the proposed solar array is not visually intrusive, or highly visible, from the public right-of-way will be considered appropriate. Solar panels that are visually intrusive interact negatively with the historic structure resulting from an incompatibility with the subject property's architectural character, scale, roof slope, color compatibility with the existing historic roofing materials, placement of the building on subject lot, or the grade of the right-of-way as it exists at the property. Applications for installation on primary elevations, in addition to the foregoing, must also meet each of the requirements and considerations of paragraph #2 (A through F), above;

4. Solar panels may be installed in **side or rear yards**, but may not exceed 8 feet in height. Freestanding or detached on-site solar panels should be installed in locations that minimize visibility from the public right-of-way. These systems should be screened from the public right-of-way with materials found elsewhere in the district such as fencing or vegetation of suitable scale for the district and setting. Placement and design should not detract from the historic character of the site or destroy historic landscape features or materials. Solar panels are not permitted in front yards.