

Ann Arbor Historic District Commission

Design Guidelines for Solar Panels and Related Appurtenances

Introduction

In 2007, Ann Arbor was designated by the United States Department of Energy as a Solar America City. This designation has increased awareness of individuals' energy consumption and has encouraged residents to investigate the use of alternative utilities that consume fewer natural resources, without reducing the conveniences of modern life. The Ann Arbor Historic District Commission offers the following material in anticipation of the demands of property owners, providing specific guidelines that consider the impact of solar panels on historic resources.

In addition to the inclusion of solar panels or solar shingles to the historic resource, the resource's owner must demonstrate that the addition of the solar panels is a part of a comprehensive energy-reducing plan that is compliant with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for the overall benefit of the resource. This plan must be provided as part of the application.

How the Secretary of the Interior's Standards Apply

Standard 2. The historic character of a property will be retained and preserved. The removal of historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

The Standards refer to "character-defining features" of a property: examples include doors, windows, porches, transoms, and the like. Both the materials and the arrangement of these features define a property's historic character, which must not be obscured, radically changed, damaged, or destroyed in making a property more energy efficient.

Example: A business owner whose building faces south wants to install an array of solar panels. Because any significant alteration to the primary facade would obscure character-defining features, the HDC could not approve installation of the south-facing wall, and the owner would have to propose an alternative location for the solar array – e.g., on the roof. *Standard 5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

Example: A homeowner proposes to install solar panels on a stucco wall. HDC would be required to review the effect of the installation on the stucco finish. If the likely consequence would be to cause the finish to deteriorate, the HDC would have to deny the application.

Standard 9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials,

features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

Alterations to the exterior must not be so intrusive that they destroy the integrity of the building's character by their very presence. Repairs or alterations must not damage or destroy historic materials directly or indirectly.

Example: A business owner proposes to install a solar array on the rear wall of a building. Although the proposed installation would not obscure or damage character-defining features, and no historic material would be destroyed, it is not clear what effect the weight of the new equipment would have on the structural integrity of the wall. The HDC might then require the owner to obtain a professional structural analysis of existing physical conditions to demonstrate that the installation will do no long-term damage to the building.

Example: A homeowner proposed to install a row of solar panels on the south-facing rear roof of her house. The panels would be fixed at a 69-degree angle from the horizontal, while the roof lies at a 45-degree angle. Because the HDC must consider the effect of the proposed work on the massing of the house – that is, the outline of the building – the Commission might require that the panels be fixed at the same angle as the surface on which they are installed, even if that is not the optimal angle for solar collection.

Standard 10. New additions and adjacent or related new construction will 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.

The HDC must consider not only the details of installation of a system, but also how it will be uninstalled and what effect that would have on the physical integrity of the structure. The method of eventual removal and repair of any resulting damage to the structure shall be clearly identified in the HDC application and any work permit application.

Appropriate

- Placing freestanding or detached solar collectors in locations that are not visible from the public right-of-way.
- Mounting solar panels at grade or on ground pole mountings. In the absence of an appropriate ground-based mounting location, panels should be mounted on side or rear facing roof surfaces.
- Installing mechanical and service equipment on the roof related to the solar units and their related devices so that they are inconspicuous from the public right-of-way and do not damage or obscure character-defining features. Such equipment should be installed in such a manner that over time the equipment will not cause damage to the resource.

- For sloped roof installations, mounting solar panels parallel to and within 8” of roof surface.
- On flat roof structures, installing solar panels set back from the roof edge to minimize visibility. Pitch and elevation should be adjusted to reduce visibility from the public right-of-way.
- Installing solar panels to provide maximum coverage of the available roof surface. When such an application is not feasible, place the panels in the most unobtrusive configuration, noting that for the most efficient application, the highest installation is generally the most favorable.
- Positioning solar panels behind existing architectural features such as parapets, dormers, and chimneys to limit their visibility.
- Using solar panels and mounting systems that are compatible in color to established roof materials. All equipment, including the panels, frames and mounting hardware should be in a similar or compatible color to the surface on which it is mounted.
- Providing adequate structural support for all new mechanical equipment.
- Installing vertical runs of ducts, pipes, and cables in closets, service rooms, and wall cavities.
- Integrating solar panels into the design of new construction at the earliest point possible to assure cohesion of design within a historic context.
- Solar shingles and other types of solar collectors will be considered on a case-by-case basis by the Commission.

Not Appropriate

- Mounting solar panels and their related devices on primary elevations or roofs that face the primary elevation or in planes that are highly visible from the street view. This location has the highest impact on the historic character of the historic building and all other options should be thoroughly explored.
- Placing freestanding or detached solar collectors in locations that detract from and/or destroy historic landscape materials.
- Removing historic roofing materials during the installation of solar panels.
- Removing or altering the historic roof configuration – dormer, chimneys, or other character defining features – to add solar panels.

- Placing solar shingles on character defining elevations or visible from the street facing façade.
- Any other alteration or installation procedure that will cause irreversible changes to historic features or materials.

Application Materials

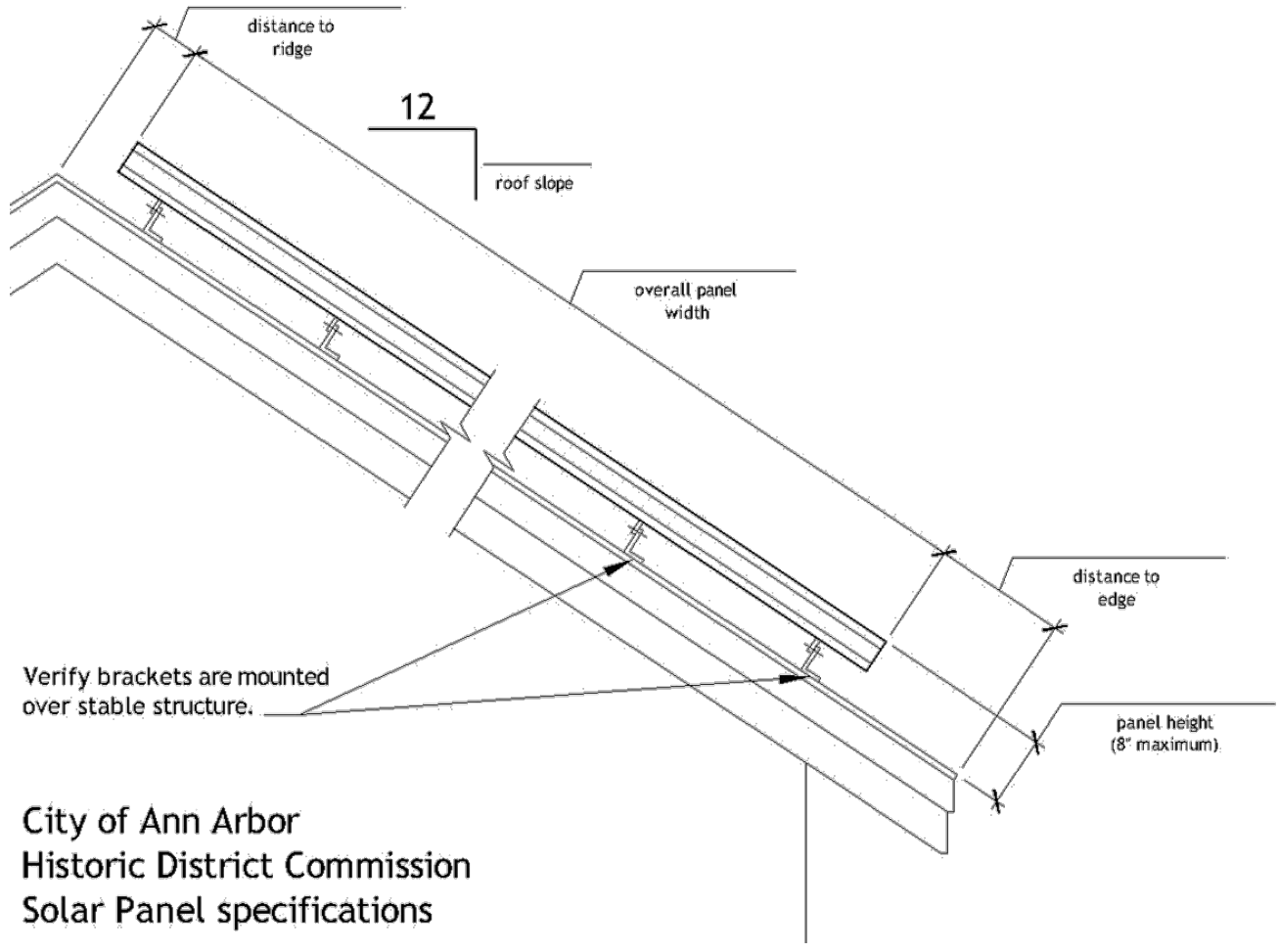
The following materials must be submitted with a completed HDC application. Additional information that may clarify the application is encouraged.

- Completed *Residential Solar Panel Worksheet* diagram (see attached)
- Photos of the roof where the panels are intended to be located
- Overall Energy Reduction plan for the historic resource
 - Include list of work previously performed and dates of work
 - Include list of work remaining to be performed and their estimated dates of work after the installation of the proposed solar panel system
 - Provide estimated energy savings or energy production caused by the installation of the proposed system
 - Provide written statement of energy savings due to work performed up to this point
- Manufacturer's product cut sheets, clearly denoting which system will be installed
- Manufacturer's photographs of the panels
- Manufacturer's installation methods, including type and location of mounting hardware and converter/wiring/metering details
- A section view showing the relationship of the panels to the roof slope, distance from roof surface to panels, and thickness of panels.

Administrative Approvals

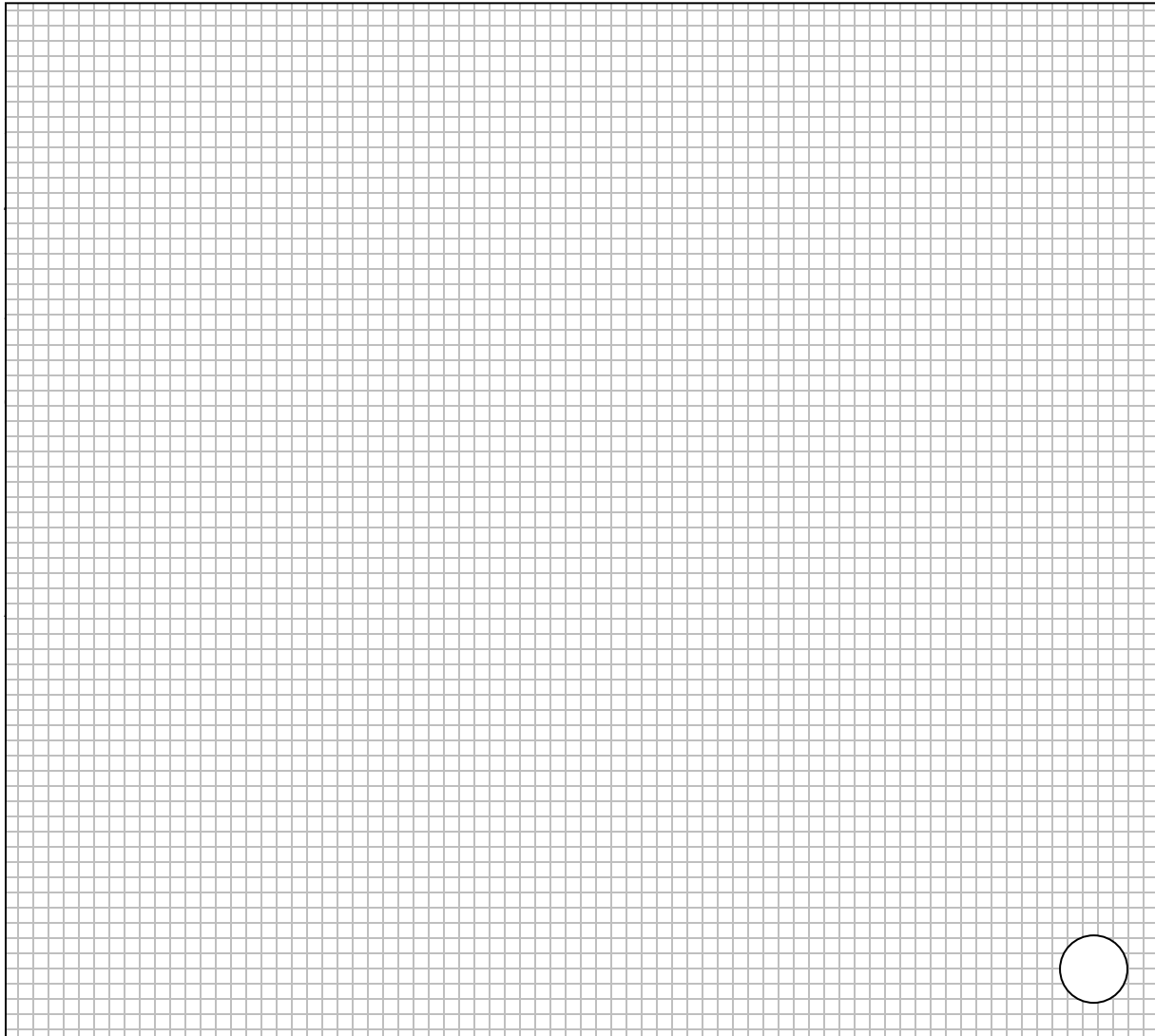
City Staff may issue a certificate of appropriateness for solar panel installations that meet the following criteria. Other installations require review and issuance of a Certificate of Appropriateness by the Historic District Commission.

Installation of new **solar panels** on non-character defining roof surfaces not visible from the street or other character defining elevations, provided the solar panels are flat, do not extend more than 8" above the roof surface, are similar to the color of the roof material and cover not more than 10% of the roof surface on which they are located.



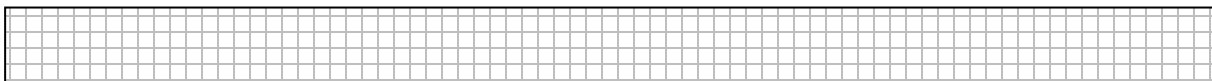
City of Ann Arbor
Historic District Commission
Solar Panel specifications

**Ann Arbor Historic District Commission
Residential Solar Panel Worksheet**



1. Drawing scale: 1 square = _____
2. Roof pitch(es) _____
3. Roof color and material _____
4. Solar panel color _____
5. Frame color _____
6. Size of individual panel(s) _____
7. Overall dimensions of installation _____
8. Sketch Lot plan and provide Lot dimensions
9. Show Building footprint and Roof ridge(s)
10. Label approximate distances to property lines
11. Identify north/south
12. Indicate location of adjacent street(s)
13. Show significant roof accessories (dormers, chimneys)

**Ann Arbor Historic District Commission
Residential Solar Panel Worksheet**



1. Drawing scale: 1 square = 2'-0"
2. Roof pitch(es) 8:12
3. Roof color and material charcoal asphalt
4. Solar panel color blue-black
5. Frame color matte grey
6. Size of individual panel(s) 36" x 60"
7. Overall dimensions of installation 108" x 120"
8. Sketch Lot plan and provide Lot dimensions
9. Show Building footprint and Roof ridge(s)
10. Label approximate distances to property lines
11. Identify north/south
12. Indicate location of adjacent street(s)
13. Show significant roof accessories (dormers, chimneys)