HISTORIC PRESERVATION COMMISSION

POLICY GUIDANCE #20-01: SOLAR TECHNOLOGY

ISSUED SUMMER

2021

HISTORIC PRESERVATION IN MONTGOMERY COUNTY

Montgomery County has a rich and complex history. Our historic places are important links to the past and contribute to the county's present character. Historic preservation recognizes and protects sites of cultural, architectural, or archaeological value so we can explore, understand, and appreciate our heritage.

The Montgomery County Historic Preservation Commission (HPC), a body established by the County Council and County Executive, implements the design review process (as outlined in Chapter 24A of the County Code) for sites listed in the L*ocational Atlas & Index of Historic Sites* or the *Master Plan for Historic Preservation*. The Historic Area Work Permit (HAWP) process manages change through the repair, alteration, or addition to historic resources while preserving their character defining features.

Climate Mobilization Resolution

In 2017, the County Council adopted an Emergency Climate Mobilization resolution (Resolution No.: 17-974), which declared a climate emergency and accelerated our community-wide climate goals to be carbon neutral by 2035. The Council charged the County Executive, Montgomery County Public Schools, and the Maryland-National Capital Park and Planning Commission to advise the Council on methods to reduce greenhouse gas emissions.

The HPC is committed to safeguarding our heritage and protecting our environmental resources. In response to the Council's resolution, the HPC released a policy statement that provided the framework for the expanded installation of solar technology inMaster Plan Historic Sites and Historic Districts (Attachment A) in January 2020.

Purpose of the Policy

The HPC released this document to assist with the review of Historic Area Work Permit (HAWP) applications for the installation of solar technology. The two main objectives are to protect the historic character of the resource and reduce visual impacts of solar panels as seen from the public rights-of-way while permitting their widespread use.

Property owners should use the guidance to assist them, as well as their architects and contractors, in planning such projects within Master Plan Historic Sites and Historic Districts. The HPC and Historic Preservation staff will use the guidance as a baseline for review and to better articulate their findings.

There is an important point to remember when using the solar technology policy guidance: every resource is unique. Historic sites of greater relative significance may require a closer evaluation and different level of treatment. Even houses and sites that look identical at first glance have distinguishing characteristics (siting from the public rights-of-way, location, materials, etc.) and development history.

Adapting historic buildings requires a balanced, thoughtful, and careful approach that responds to the immediate need to mitigate climate change and protects the historical characteristics valued by the community.

The Historic Preservation staff and the HPC recognize the fluidity of solar technology and will update the policy guidance to reflect technological improvements and new products as they become available.

Overall Guidance

1. This policy guidance applies to all Master Plan Historic Sites and Historic Districts.
2. Property owners should consider conducting an energy audit (blower door test, thermographic scan, attic inspection, etc.) to determine the current performance of the building envelope and systems. It may be practical to address some of these issues prior to the installation of a solar system.
3. Contact your utilities company for a free Quick Home Energy Checkup and a discounted Energy Audit.
4. All solar installations will require a Historic Area Work Permit (HAWP) from the Historic Preservation Commission.
5. Solar panel installation will be considered on a case-by-case basis. Master Plan Sites or individual sites within a district recognized for their architectural significance will require a greater level of review. The appropriate option will depend on the character defining features of the resource.
6. Solar panel installations should conform to the *Secretary of the Interior's Standards for Rehabilitation* to the greatest extent possible.
7. The majority of historic buildings can be retrofitted with solar technology, but there may be limited instances in which solar is not feasible or appropriate to the historic resource or setting.
8. All projects must meet building code, zoning requirements, and any local jurisdictional requirements. Applicants must check with all permitting bodies to ensure feasibility of the proposal.

The applicable standards are:

Standard Two: 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.

Standard Five: Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.

Standard Eight: Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Standard Nine: 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.

Standard Ten: 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.

Historic Area Work Permits Requirements

1. All solar installation proposals should include photographs depicting the existing conditions of the roof and site with particular attention to elevations or areas visible from the public rights-of-way.
2. For building-mounted solar installations, include a roof plan showing the existing features (such as chimneys, skylights, vents, etc.) and the placement of the proposed panels. The plan should include the measurements of the panels from the edges of the roof.
3. Historic Preservation staff may require photographic renderings of the planned installation.
4. For freestanding solar installations, include a site plan that shows all buildings, outbuildings, and other landscape features (fences, burial grounds, tree stands, etc).
5. Historic Preservation staff may require photographic renderings of the planned installation.
6. All solar installation proposals should include detailed specifications including the tonnage (steel racks), steel framework (freestanding panels), and height, size, and thickness of the panels.

Types of Solar Systems

Roof-Mounted Solar Systems

Roof-mounted photovoltaic systems are affixed to a building by means of a steel-frame racks or mounting. The racks are secured to the underlying roof rafters. Installation options include monocrystalline, polycrystalline, and thin-film panels. The newest solar technology includes building-integrated photovoltaics that are designed to mimic architectural asphalt shingles, tiles, and other roofing materials. All photovoltaic systems require inverters and other associated conduits and hardware.

Freestanding Solar Systems

Freestanding solar systems are supported by metal framework that is anchored to the ground and independent of a building. The systems are placed away from a residence and connected via underground wiring.

Freestanding arrays benefit from a lack of restrictions. The size of the arrays are independent from the roof or the characteristics of the roof (slope, direction, obstructions such as chimneys, vents, etc.).

Pole-mounted solar systems often allow for tracking systems to optimize the position of a panel based on the time of day and the season.

Source: Sunflare, http://www.sunflaresolar.com.

Figure 2: Example of a thin-film solar panels that adheres between the seams of an existing standing-seam metal roof.

http://www.tesla.com.

Figure 3: Example of a building-integrated photovoltaic system that serves as the outer layer of the roof and generates electricity.

Source: Jon Callas.

Figure 1: Example of an installation of traditional roof-mounted solar panels on a steel rack.

Source: Chelsea, Unsplash.

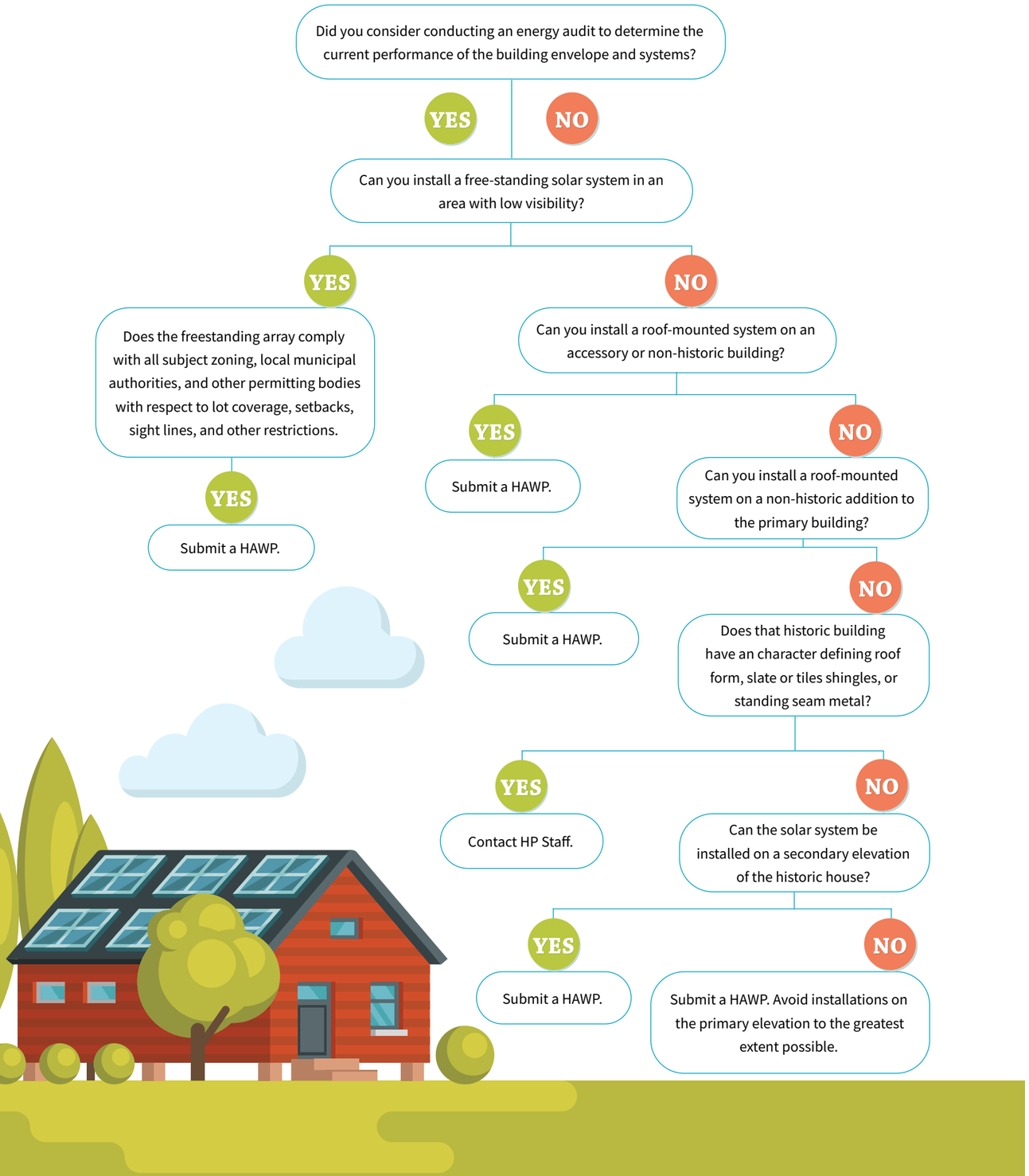
Figure 4: Example of a freestanding solar array.

Items to Consider When Installing Solar Systems

The following section outlines actions to consider when planning for the installation of solar technology. Specific placement and installation guidance regarding the preferred placement of solar systems in suburban and rural historic sites and districts will be provided in subsequent sections.

PREFER	AVOID
Engage an engineer, architect, or solar specialist to assess the feasibility of a solar installation.	Installation of solar technology without considering other treatments to improve the building's energy efficiency. Reducing the amount of energy used by your home will allow for a smaller, less expensive system.
Analyze the defining features of the historic resource and determine whether solar technology will compromise irreparably the character of the site or district.	Demolition of or impact to character defining architectural elements of the house or historic district. This includes roof forms (i.e. mansard roofs), materials (slate, tile, and standing seam metal), configuration, dormers, or chimneys that are essential to the architectural significance of the building.
Installation of freestanding solar technology in areas with low visibility from the public rights-of-way.	Installation of freestanding solar technology that obscures views of the historic resource.
Installation of roof-mounted solar technology on a non-historic building, accessory structure, or addition where it will have minimal impact on the historic resource or site.	Installation of roof-mounted solar technology on the primary resource when other less intrusive options are available.
Installation of roof-mounted solar technology on the rear or less visible elevations of a historic building.	Installation of roof-mounted solar technology on the front elevation when other less intrusive options are available.
Installation should avoid damage to historic roofing materials and be reversible.	Installation that removes, replaces, or damages the design or materials of an architecturally significant roof. This includes altering the pitch to accommodate solar technology.
Placement of solar technology in locations that do not impact the landscape or require the removal of trees.	Removal of mature trees to permit the installation of solar technology.
Investment in off-site community solar if installing solar technology is not a viable option.	

Solar Panel Historic Area Work Permit Flowchart



Solar Panels in Suburban Historic Sites or Districts

For most suburban historic sites or districts, the installation of solar technology either on the property or the building will be possible. The HPC encourages projects that meet solar access while maintaining integrity of historic features, materials, and spatial relationship.

During the planning process, the property owners must consider the character defining features of the resource and the surrounding historic district when determining the appropriate placement and design of the systems.

Solar System Locations
(most to least preferred)

Preference #1: Freestanding Solar Arrays

In the typical suburban district, the use of freestanding solar systems is less likely due to the size of the typical lot and the existing tree canopy. When feasible, the installation of such systems should be located in the rear of the property or other locations that minimize visibility from the public rights-of-way. These systems should be screened with fencing and/or vegetation.

The HPC will consider the installation of freestanding solar arrays in the front of properties on a case-by-case basis when other locations are infeasible.

Preference #2: Roof-mounted Solar Systems on Accessory Structures or Non-Historic Buildings

If freestanding solar arrays are not possible, the property owner should consider the installation of roof-mounted solar systems on accessory structures (outbuildings, garages, etc.) or non-historic buildings. This will protect the primary resource on the property.

Preference #3: Roof-mounted Solar Systems on Non-Historic Additions of the Main Dwelling or Building

If roof-mounted solar systems are infeasible on accessory structures or non-historic buildings, the property owner should consider the installation of such technology on non-historic additions of the main dwelling or building.

The solar systems should be located on secondary elevations to minimize visibility from public rights-of-way. Installation of solar system on the primary elevations of non-historic additions will be preferred over installation on the historic section of the resource.

Preference #4: Roof-mounted Solar Systems on Historic Buildings

If the other three preferred locations are infeasible, the property owner should consider the installation of panels on the historic building. Solar technology will be considered on all elevations of historic resources unless the roof is considered a character defining feature. The HPC prefers all solar systems to be located on secondary elevations before consideration of primary elevations visible from public rights-of-way. The systems should be hidden behind existing architectural features (such as dormers, chimneys, etc.) to limit their visibility.

The HPC will consider the replacement of asphalt shingle roofs with solar shingles (building integrated photovoltaics) on roofs that are not character defining features of the resource.

In most circumstances, solar systems will not be considered on historic buildings with roofs that are the primary defining architectural characteristic due to its design or materials. This includes any roofs covered with original slate or tile shingles. At the present time, solar shingles and similar building-integrated photovoltaics are not an appropriate replacement for slate or tile shingles and standing seam metal. This policy will be re-evaluated as new technologies emerge.

On a case-by-case basis, the HPC will consider solar system on architecturally significant roofs when the applicant can demonstrate that the system will be installed without damaging the historic fabric of the resource or diminish the character of the site or district.

Installation Guidance

Freestanding solar systems should:

1. Be screened from the public right-of-way to the greatest extent possible.
2. Have a suitable scale for the district and the setting.

Traditional roof-mounted solar panels should:

1. Have a low-profile.
2. Be mounted less than or equal to six inches above the surface of the roof (to the face of the panel).
3. Be consistent with the existing slope of the supporting roof.
4. Setback solar panels from the edges and ridge of the roof.
5. Place any conduits for connections to electrical meters on the inside of the building or on a secondary elevation.
6. Locate conduits, inverters, storage units, or other hardware associated with the panels on the interior or on secondary elevations with limited visibility from the public rights-of-way.
7. Blend with the surrounding features of the historic resource with respect to color of the panel, support racks, and conduits.
8. Be arranged in an organized configuration and avoid disjointed and multi-roof solutions. This may require the relocation of modern vents, pipes, etc.

Source: Historic Preservation Program, Montgomery Planning. Source: Historic Preservation Program, Montgomery Planning.

CASE STUDY

CASE STUDY #1

QUEEN ANNE DWELLING

Figure 5: Model of a Queen-Anne styled dwelling with a detached garage. The subsequent illustrations depict the preferred locations for solar systems. Optimal solar access requires a southern exposure (see site plan for directional arrow).

Preference #1

Figure 6: The first preferred placement would be a freestanding system in the rear of the property. The existing trees coverage in this illustrative example permits such a system, but it is recognized that most suburban lots would have limited solar access with freestanding panels.

Preference #2

Figure 7: The second preferred placement would be a roof-mounted system on the garage (an accessory building) as the existing tree canopy prohibits adequate solar access from a freestanding array.

Preference #3

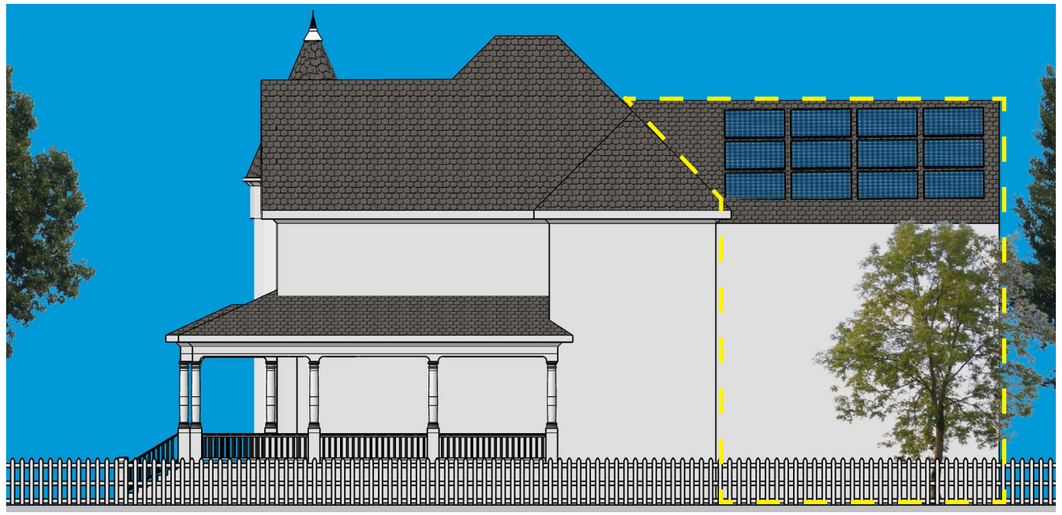


Figure 8: The third preferred placement would be on a non-historic addition to the original house. This example shows an addition (dashed yellow line) to the rear of the historic house where the panels would be placed.

Preference #4

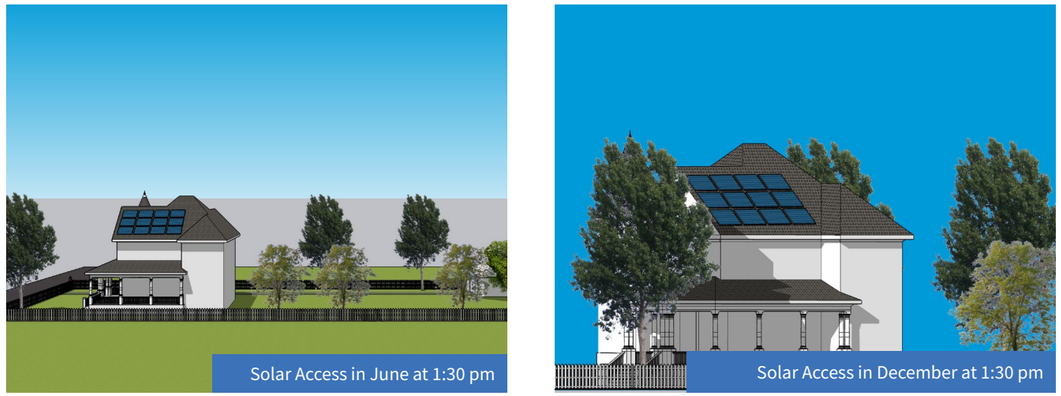


Figure 9: The fourth preferred placement would be a roof-mounted system on the architectural asphalt shingle roof of the historic house. In this example, there is no non-historic addition to install the system on. Placement on the historic massing should be pursued only after exhausting all other options.

Avoid

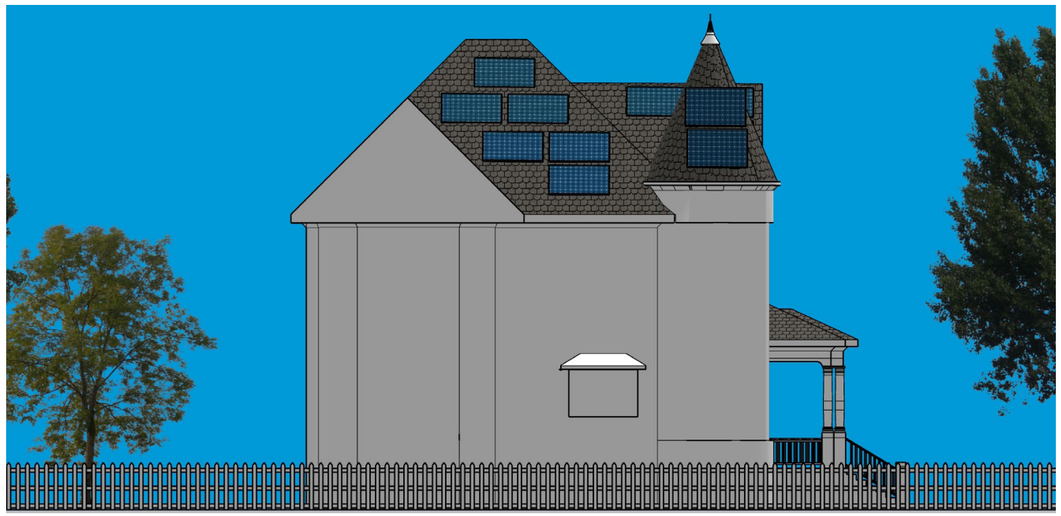


Figure 10: If the southern exposure was on the opposite side of the building, the placement of solar panels would require further review and analysis by the Historic Preservation Commission. Solar panels should not be placed on character defining features of the roof such as the tower. In addition, solar panels should not be installed in a disjointed manner on multiple roofs.

CASE STUDY

CASE STUDY #2

BUNGALOW

Figure 11: Model of a Craftsman-styled bungalow with a non-historic two-car detached garage. The subsequent illustrations depict the preferred locations for solar systems. Optimal solar access requires a southern exposure (see site plan for directional arrow).

Preference #1

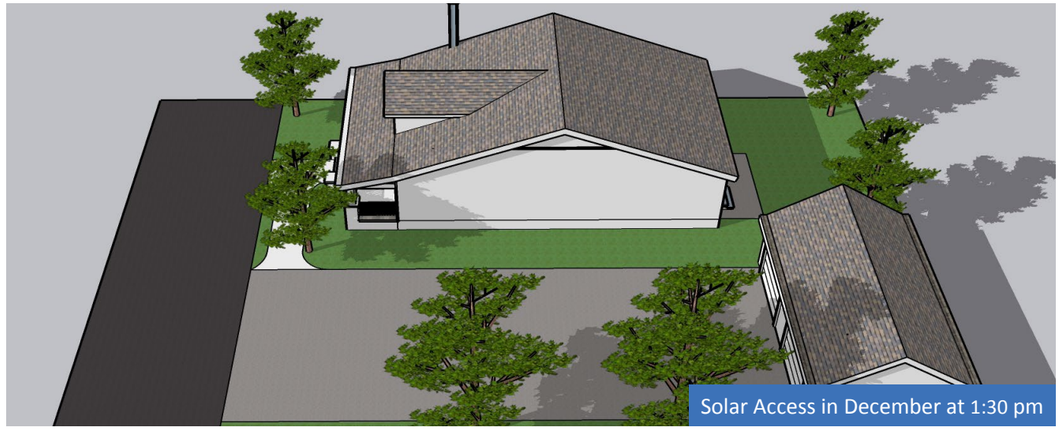
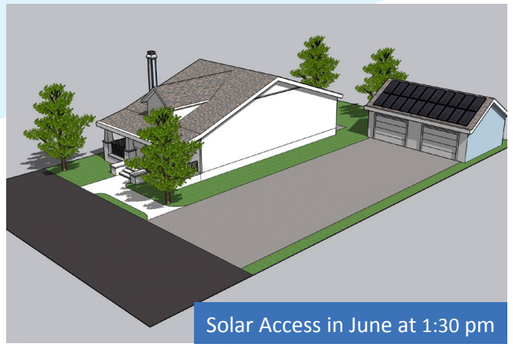


Figure 12: The first preferred placement would be a freestanding system in the rear of the property. This example does not permit such a system due to the small size of the lot and the existing tree canopy.

Preference #2



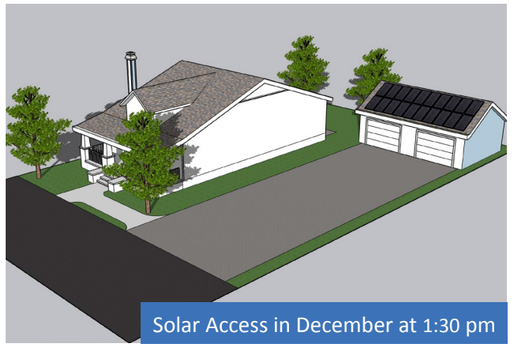


Figure 13: The second preferred placement would be a roof-mounted system on the non-historic garage (an accessory building).

Preference #3

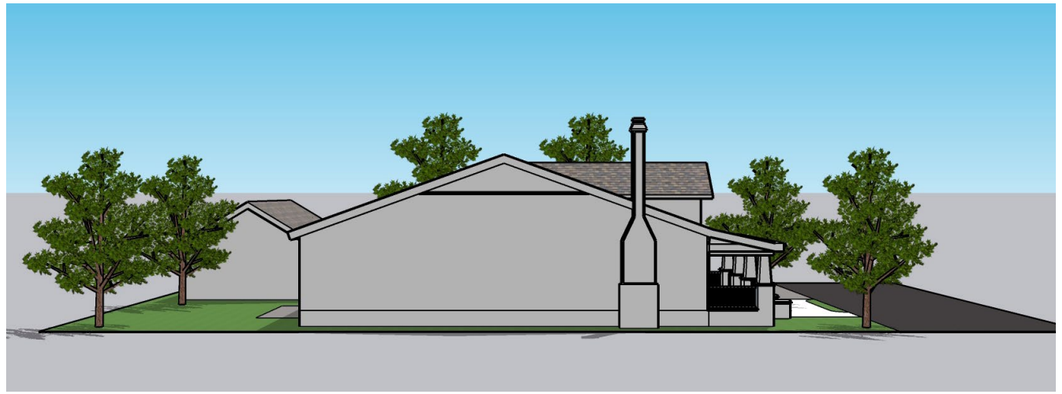
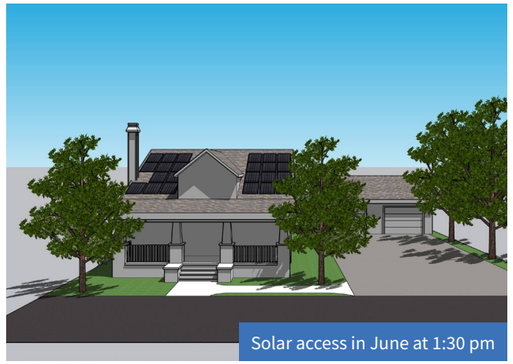


Figure 14: The third preferred placement would be on a non-historic addition to the original house. This is not possible in the above example.

Preference #4



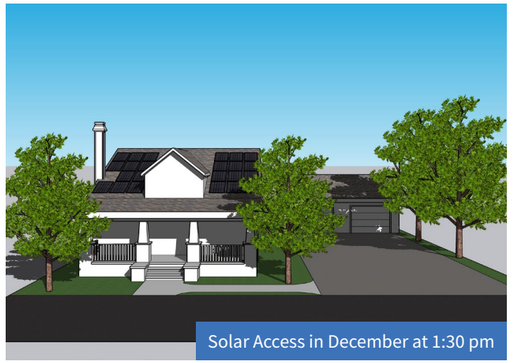


Figure 15: The fourth preferred placement would be a roof-mounted system on the asphalt shingle roof of the historic house. Placement on the historic massing should be pursued only after exhausting all other options.

EXAMPLES OF SOLAR SYSTEMS THAT DO NOT MEET THE HPC GUIDANCE

Example 1: The solar panels does not match the slope of the roof.

Example 3: The solar panels do not match the slope of the roof due to installation on incorrect exposure.

Example 2: The solar panels extend over the edges of the roof.

Example 4: The solar panels are arranged in an unorganized configuration. Modern vents should be moved to accommodate solar panels.

Example 5: The solar panels extend beyond the ridge of the roof, there are two different types of panels of different colors, and the conduits and inverters are highly visible on the exterior of the building.

Example 6: The solar panels are located on multiple roofs, arranged in an unorganized configuration, and the conduits are visible in the roof.

Example 7: The solar panel conduits runs along the face of the roof and building.

Example 8: The solar panels are arranged in an organized manner, but the conduits and inverters are highly visible from the front elevation.

Example 9: The solar panels are raised too far from the surface of the roof and extend over part of the hip roof form.

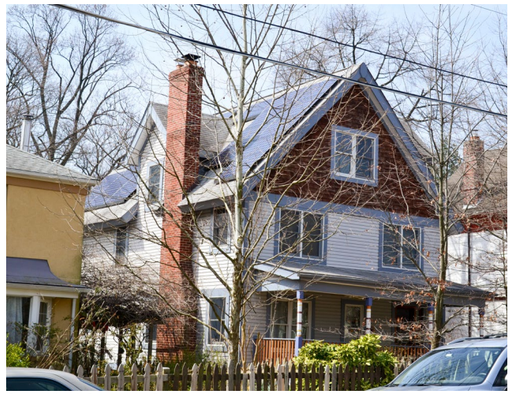
Example 1-9 source: Green Sun Energy Services, http://www.greensunnj.com.

EXAMPLES OF SOLAR SYSTEMS THAT MEET THE HPC GUIDANCE

Source: Historic Preservation Program, Montgomery Planning.

Example 1: The solar panels are arranged in an organized configuration.

Example 3: The solar panels are placed in an organized configuration on an outbuilding (barn).



Source: Historic Preservation Program, Montgomery Planning.

Example 2: The solar panels are arranged on the secondary elevation in an organized fashion.

Source: Planning Department, Delaware County, Pennsylvania.

Example 4: Solar panels on a Victorian-era house. The panels are setback from the edges of the roof and located on a secondary elevation.

Source: Historic Preservation Program, Arlington County, Virginia.

Example 5: An example of solar panels placed primarily on an addition to a historic house. The panels have limited visibility from the public rights-of-way.

Source: Historic Preservation Program, Montgomery Planning.

Example 6: An example of a building with integrated photovoltaic solar shingle. The solar shingle replaced an asphalt shingle roof.

Solar Panels in Rural Historic Sites or Districts

Rural historic sites and districts are often associated with cultural landscapes. For rural landscapes, these often are geographical areas that have been used by people, or shaped or modified by human activity, occupancy, or intervention. The areas posses a continuity of land use, vegetation, buildings, structures, roads, waterways, and natural features.

The availability of open space in rural areas provides greater opportunity for the installation of free-standing solar panel arrays. For this reason, solar systems should not be placed on historic dwellings, barns, or outbuildings unless: 1) the landscape is of greater significance than the buildings; 2) there are no feasible or appropriate locations for a ground-mounted array; or 3) a roof-mounted array would have less impact to the historic site or district.

During the planning process, the property owners must consider the character defining features of the resource and the surrounding historic district when determining the appropriate placement and design of the systems.

Consultation with Historic Preservation Program staff from the start of the project is recommended as rural historic sites and districts will often require a greater level of analysis due to individual variations between historic sites.

Note: The installation of freestanding solar systems may require archaeological investigations depending on the history of the land use and the site conditions.

Installation Guidance

Freestanding solar systems should:

1. Be screened from the public right-of-way to the greatest extent possible.
2. Located outside of the core building area. The array should not interrupt the visual relationship between the dwelling and associated outbuildings, barns, family graveyards, and other site features.
3. Have a suitable scale for the district and the setting.

Traditional roof-mounted solar panels should:

1. Have a low-profile.
2. Be mounted less than or equal to six inches above the surface of the roof (to the face of the panel).
3. Be consistent with the existing slope of the supporting roof.
4. Setback solar panels from the edges and ridge of the roof.
5. Place any conduits for connections to electrical meters on the inside of the building or on a secondary elevation.
6. Locate conduits, inverters, storage units, or other hardware associated with the panels on the interior or on secondary elevations with limited visibility from the public rights-of-way.
7. Blend with the surrounding features of the historic resource with respect to color of the panel, support racks, and conduits.
8. Be arranged in an organized configuration and avoid disjointed and multi-roof solutions. This may require the relocation of modern vents, pipes, etc.

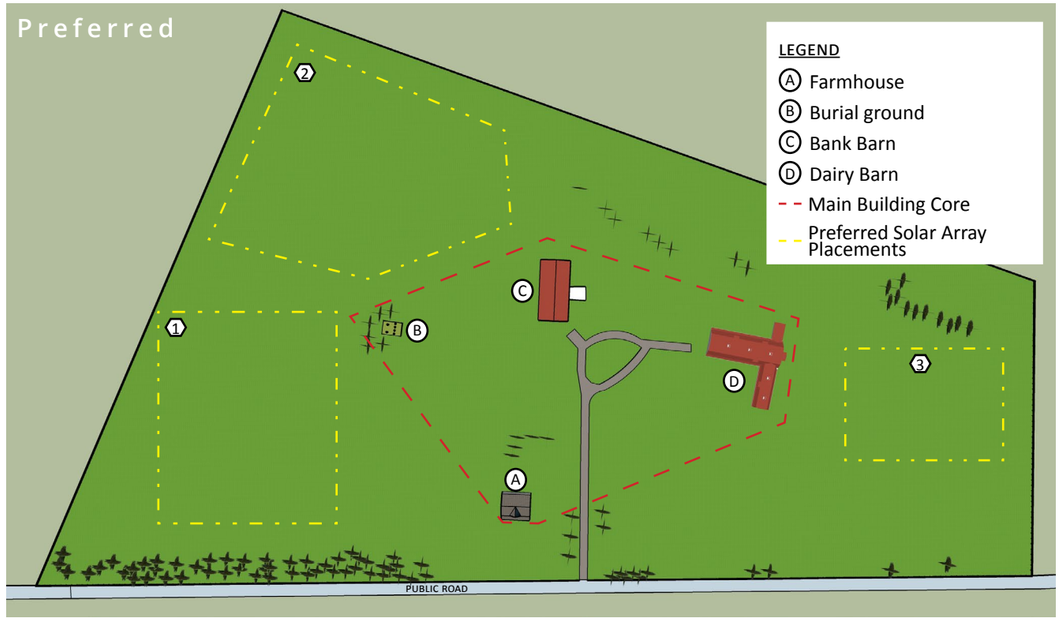


Figure 16: Illustrative site plan of a historic farm. Free-standing solar panel arrays should not obscure major view sheds of the buildings or family burial ground from the public rights-of-way or be placed within the main building core. Preferred solar array placement #1 avoids view from the public rights-of-way due to the trees lining the public road and does not disrupt the main building core. Solar array placement option #2 is located in the rear of the property with limited views and outside of the main building core. Solar array option #3 is less optimal due to its visibility from the public rights of way. This option, however, is outside of the main building core and does not inhibit primary views of the dairy barn so it would be considered.

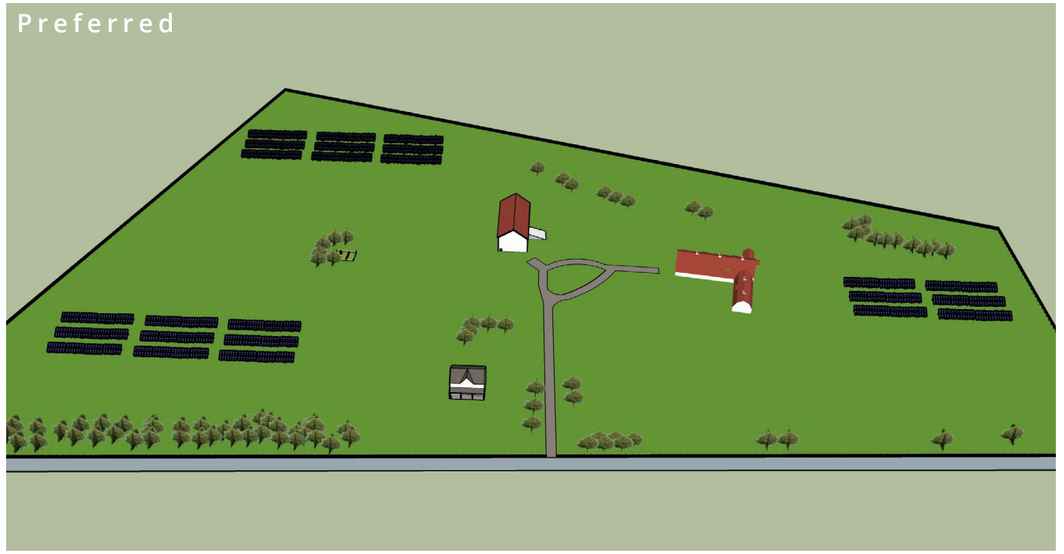


Figure 17: All three preferred locations of solar panel arrays are shown.

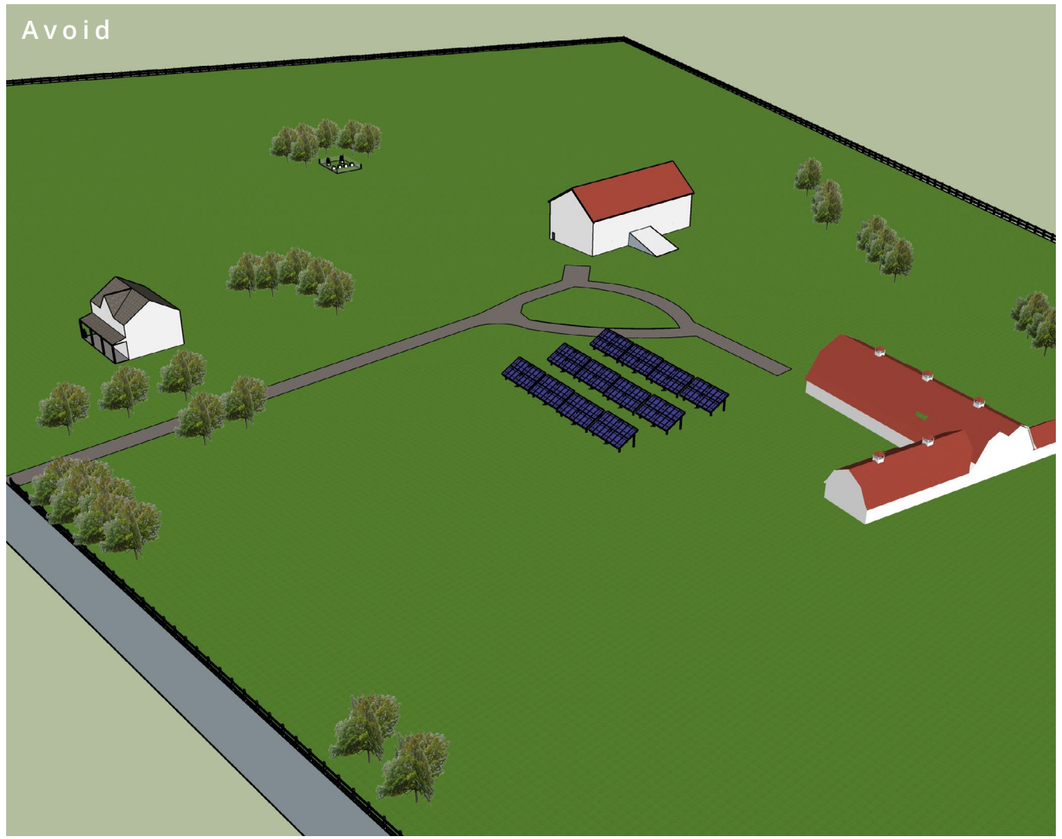


Figure 18: Avoid the placement of solar panel arrays within the main building core. The array interrupts the visual relationship between the house and the agricultural buildings. It also obscures views of these buildings from the public right-

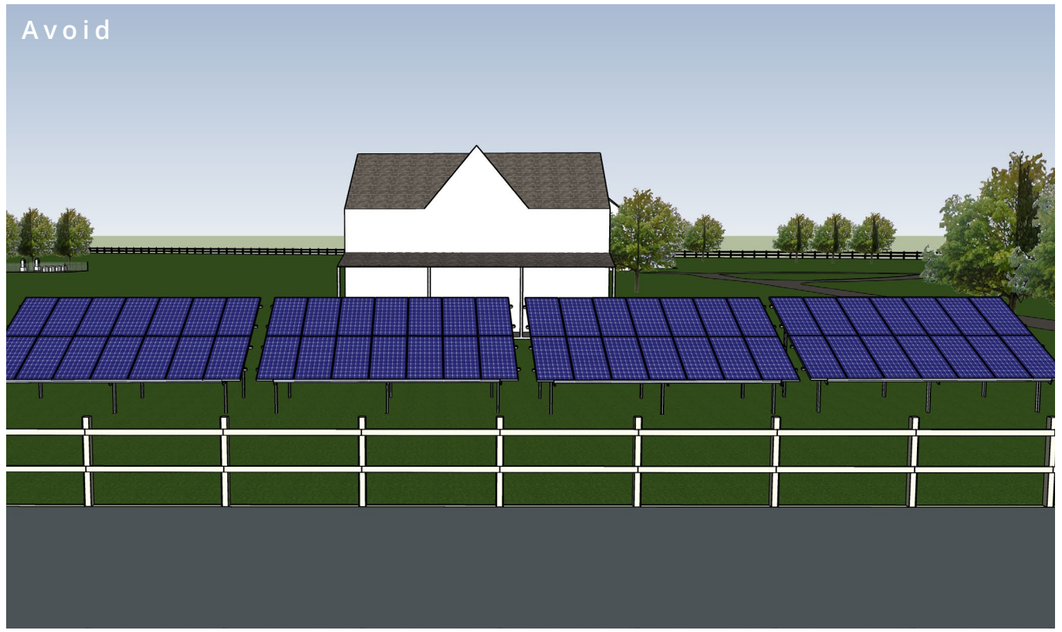


Figure 19: Avoid the placement of solar panel arrays between the main dwelling and the public rights-of-way.

Figure 20: Avoid the placement of solar panel arrays that interrupt the relationship between the family cemetery and the historic house (if one is present).

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