

Massachusetts Historical Commission – Project Notification Form

Project Description

Wright-Locke Farm Solar Photovoltaic Energy System Project

Project Background:

The Wright-Locke Farm Conservancy, on behalf of the Town of Winchester, seeks to install solar panel arrays on the south facing roofs of the 1827 Barn and Squash House. The project will enable Wright-Locke Farm to generate sufficient electricity to provide for its electrical and heating needs allowing the Farm to approach “net zero” energy consumption and serve as a visible community example of responsible environmental stewardship in this time of increasing climate change. The Farm’s recently adopted 5-year strategic plan calls for actively engaging environmentally sound decision making in all of our undertakings.

Project Description:

The plan calls for installing 97 – 250 watt DC SunPower panels on the 1827 Barn and 75 -250 watt DC panels on the Squash House. The panels measure 2 feet 7 inches by 5 feet 1 inch and are all black to blend into the existing dark grey asphalt roof shingles. The panels will tightly abut so there are no visible gaps between panels and will be arrayed symmetrically over the roof plane. (See attached photos depicting existing conditions, mockups of panel placement on each roof and photo mockups of panel appearance on roofs.)

Great care has been taken to select panels with solid black surfaces and no aluminum frames to minimize visual impact. The panels will be fastened approximately 4 to 6 inches above the roof plane with no fastening hardware visible. In keeping with Massachusetts Historical Commission guidelines the panels are fully removable allowing the buildings to be restored to their current condition in the future, if so desired.

Alternative Panel Locations Considered:

Both the 1827 Barn and Squash House are ideally situated for solar power production with due south orientation and appropriately pitched roofs. In addition, the roofs are minimally visible from Ridge Street, a major north/south thoroughfare. Recognizing the buildings’ historic importance, alternate site options were considered. There are no other appropriate roof mount options due to roof sizes, configurations or shaded locations:

- Farm House – dormer intrusions, excessive shading
- Farm Stand/Garage – small roof size, shading
- Lean To – excessive shading, deteriorated building condition

- Farm Pond Shed – improper orientation, shading
- 82 Ridge Street house – north/south orientation, deteriorated building condition

In addition to roof mount alternatives, ground mount locations were also considered. The limited size of the farm property is a significant impediment to solar panel location. Our very limited flat land – less than 2 acres - is devoted to growing local, certified organic fruits, vegetables and flowers which is central to the Farm’s mission. Devoting a portion of this productive land would compromise a significant financial resource and be visually intrusive to the beauty of the Farm.

Likewise, placing solar panels on the hilly pasture areas of the farm would have extreme visual impact. As we have come to appreciate over the years of our farm stewardship, the entire Farm landscape has significant visual appeal and impact for those visiting the Farm. We feel ground mount solar panels would have a significantly greater impact on the feel of this 18th and 19th century farmscape than panels placed on our two south facing roofs.

Of the 20 acres that comprise the entire farm property, one-half of the land has recently been placed in a permanent conservation restriction with the Winchester Conservation Commission. That CR prohibits any permanent structures, removing this area from consideration.

The only remaining ground mount location option is immediately to the north of the cistern. The topography of this land is steeply sloping to the north making ground mounts in this location not viable due to sun angles, and extensive infrastructure requirements.

A Legacy of Technological Innovation at Wright-Locke Farm:

The history of New England farms, and Wright-Locke Farm in particular, is a history of adaptation and technological innovation. Changing economic, social and environmental conditions and the challenge of eking out a living in any farm-based enterprise has necessitated continual innovation in farming practices, technology and outlook. Nowhere is this more self evident than in the history of Wright-Locke Farm. Some of those tangible innovations include:

- Mechanized underground irrigation system
 - o The farm implemented a mechanical irrigation system that relied on elaborate underground piping to distribute water to the various growing fields. Water was pumped out of the farm pond via a coal-fired pump in the basement of the Squash House to a 30,000-gallon cistern on top of the highest point on the property. Gravity would then be employed to distribute water to the appropriate field.

- Heated Squash Barn allowing fresh produce season extension
 - o The Locke family constructed an innovative heated barn known as a Squash House around 1915. This building, with heat, light and 2nd floor storage racks, was innovative at the time and allowed for overwintering of fresh produce. This enabled the Lockes to sell produce, principally Blue Hubbard squash, into the Boston market at much higher prices during winter fresh produce scarcities. This building demonstrates the technological foresight of the Locke family, a forward-looking tradition that we hope to recognize in our solar power project.

- Evolution from horse drawn cultivation practices to tractor assisted cultivation
 - o The farm contains many examples of technological innovations employed over time to make farming more efficient and profitable. The farm transitioned from horse-powered implements, to gas powered tractors, to more innovative 2-wheeled walk behind tractors to, hopefully, electric powered tractors in our future.

- Evolution from horse-drawn distribution practices to combustion engine truck distribution
 - o Similarly to cultivation practices, distribution vehicles moved from horse-drawn wagons that would bring produce into the Boston market to early 20th century diesel power delivery trucks. Our hope is one day we would deliver fresh produce in eclectic powered delivery vans powered by our solar panels.

In Conclusion: Why are Solar Panels Appropriate on Our Barns:

In this era of rapidly accelerating climate change with dramatic negative impacts to the environment and human health, it is becoming increasingly clear that we all must take actions, however small and localized, to mitigate adverse climate events. Nowhere is this more evident than on a small, diversified farm that is impacted by rapid shifts between oppressive heat and drought and torrential microbursts dropping inches of rain in just hours. This past summer, many Massachusetts farms had to cease operations due to flooded out fields and ruined crops. These conditions will only accelerate in coming years.

Wright-Locke Farm, with its' mission of community involvement and education, is an ideal place to showcase small-scale initiatives to combat climate change. By generating approximately 54,000 kW of solar power on our two barns, we can effectively eliminate our reliance on fossil fuels to power our electrical and heating

needs on our farm. As noted above, this could even extend to innovative electric powered tractor/cultivators. The educational value of this initiative to all members of our community can be significant.

Changes to our practices and lifestyles do not come without cost. The financial investment aside, there is the cost of visual impact on our historic barns. We take our responsibility to steward our historic buildings seriously. In fact, the Wright-Locke Farm Conservancy has invested over \$500,000 in privately donated funds to restore these buildings in historically appropriate ways, in each instance with the required approval and consent of the Massachusetts Historical Commission.

We try to minimize these costs. Our selection of uniform black solar panels and the symmetric layout of the array will help minimize the visual impact on the structures. As noted above, the southern exposed roofs are largely not visible from the public right of way and are high in the air so as not to be too visible from the main farmstead path that runs along the barns to the south. The panels will be affixed close to the surface plane of the roofs so that the volumetric massing of the buildings is not altered. No architectural details, cupolas or eaves will be impacted. Finally, the solar panel installation is completely reversible so that the buildings could be restored to their current condition, as is required for MHC approval. It should be noted that the asphalt shingles came into widespread use in the late 1930's and, as such, are not original to either building.

One of the most important aspects of Wright-Locke Farm is that it is an active, working farm inviting many constituencies to become involved in its ongoing operation. This is especially impactful on an historic 18th through 21st century farm. Our value is not as a static museum of the past, but more as a working, vibrant place where the past is valued, but where change can be part of our teachable history and the ongoing legacy of the Wright and Locke families.

We hope that the Massachusetts Historical Commission will join us in taking this important step in honoring the Farm's history of innovation while looking to the future.