



Subject: Installing Green Roofs on Historic Buildings

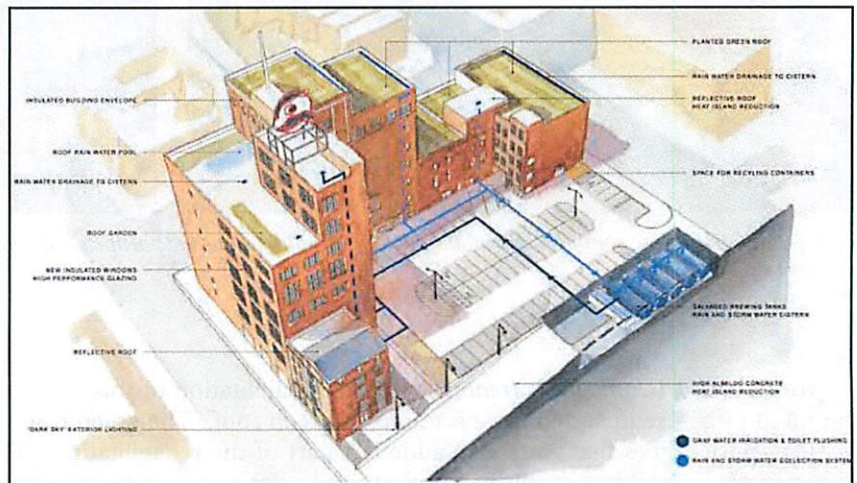
Applicable Standards: 2. Retention of Historic Character
9. Compatible New Additions/Alterations
10. Reversibility of New Additions

Issue: Green buildings are promoted as energy saving, environmentally friendly, and sustainable. One way of increasing the sustainability of a building is to install a green roof. A green roof is a thin layer of vegetation planted over a waterproofing system that is installed on top of an existing flat or slightly-sloped roof. A green roof helps cool the building and the surrounding urban environment; filter air; collect and filter storm water; contribute to biodiversity; and provide urban amenities, including vegetable gardens, for building occupants.

Enhancing the energy-efficiency and sustainability of a historic building is as important as incorporating energy-efficient features into new structures. While a green roof is not a compatible feature for many historic buildings, when it is appropriate, a green roof can greatly improve energy efficiency by reducing temperatures on the roof. This also reduces the mechanical cooling loads. However, despite the potential benefits of a green roof, as with any rehabilitation treatment there are specific issues, including increased structural loads, added moisture, and root penetrations through waterproofing layers, that must be addressed before considering installing this feature on a historic building. Most importantly the historic character of the building must be retained. In order to meet the Secretary of the Interior's Standards for Rehabilitation, any vegetation planted as part of a green roof on a historic structure must not be visible above the roofline from public thoroughfares because it would negatively impact the character of the building.

Application I (Compatible treatment): A defunct brewery complex, constructed in the late-nineteenth century, was rehabilitated for mixed use including office space, storage, and retail. The owners wanted to integrate green features into the project to make it more sustainable and to take advantage of local energy tax credits as well as the Federal Historic Preservation Tax Incentives. Accordingly, green roofs were constructed on several of the buildings with flat roofs that were suitable for such an installation. These buildings are tall with sufficiently high parapets so that the roof plantings are not visible from the public right of way. The incorporation of green roofs on these historic brewery structures meets the Standards.

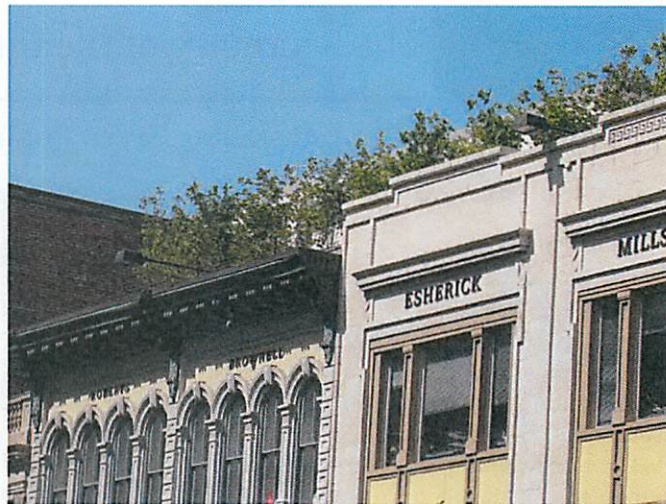
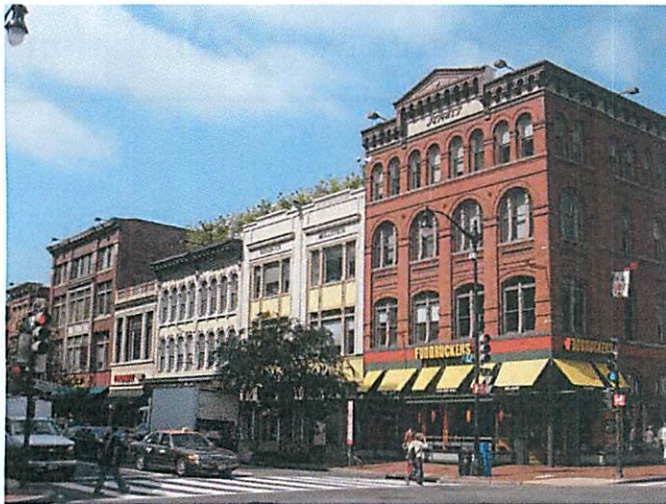
*Above: The plantings are low and are not visible from the surrounding streets due to the high parapets of the historic buildings.
Below: View of the green roofs after installation.*



The location of the green roofs as well as water collecting tanks and graywater redistribution systems are illustrated in this rendering of the brewery complex.

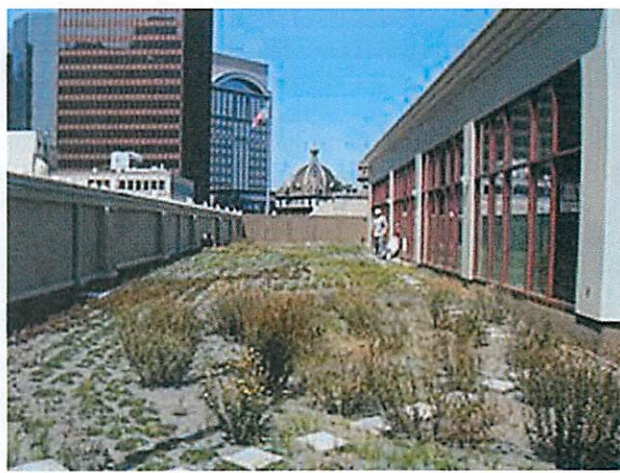


Application 2 (*Incompatible treatment*): Two neighboring late-nineteenth and early-twentieth century commercial buildings added green roof features to take advantage of the energy benefits and to provide a pleasant space for building occupants. The three-story buildings front a busy city street where they are highly visible from many vantage points along the street. Although the buildings have substantial parapets, the trees, which can be seen from the street below, negatively impact the character of these historic buildings.



The plantings on these commercial buildings—highly visible above the parapets—are not in keeping with the historic character of the structures.

Application 3 (*Compatible treatment*): The rehabilitation of this early-twentieth century former department store for office and retail use included large sections of green roof. The green roof consists of planted terraces used by tenants of the penthouse offices that were also added as part of the rehabilitation. The sustainable green roof increases the energy efficiency of the building, and the green groundcover also acts as an acoustical damper for the rooftop offices. The tall parapets completely hide the green roof from view—and also conceal the new penthouse addition, ensuring that the historic character of the building is retained while incorporating this energy-efficient and environmentally-friendly feature. This project meets the Standards.



*Left: Roof of the rehabilitated department store building with of green roof sections.
Right: The tall parapet conceals the plantings and the penthouse from the street below.*

Liz Petrella, Technical Preservation Services, National Park Service

These bulletins are issued to explain preservation project decisions made by the U.S. Department of the Interior. The resulting determinations, based on the [Secretary of the Interior's Standards for Rehabilitation](#), are not necessarily applicable beyond the unique facts and circumstances of each particular case.