



GREEN SANCTUARIES:

Rehabilitating and Managing Historic Sacred Places and Landscapes in an Environmentally Responsible Manner

As more of the faith community embraces the environmental movement, congregations with historic buildings now have incentive to research and establish results for renovating and rehabilitating existing buildings in this cutting-edge field. The United States Green Building Council (USGBC) and some faith traditions are working together to create ecologically sound sacred spaces (see sidebar). Some congregations are trusting architectural firms and engineers experienced in green design to be guides through the process. Whether a congregation adheres to governmental green regulations during a renovation or simply adopts energy-saving methods of operations and maintenance, there are many opportunities for religious buildings to save money while preserving the building and protecting the environment.

Preservation and green design do not have to be mutually exclusive disciplines. "There is a kinship between historical preservationists and energy conservationists," comments Andrew Rudin, project coordinator for the Interfaith Coalition on Energy (ICE) in Philadelphia. "If a building is already existing, it is probably the greenest it can get, rather than opening up a hole in the ground and dropping in a new church."

An Environmental Benchmark

The USGBC established the Leadership in Energy and Environmental Design (LEED) Certification Process to recognize buildings whose owners, designers, and builders have demonstrated a whole-building approach to sustainability. The performance-based benchmark system for renovations and existing buildings addresses sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

Friends Center in Philadelphia, a *New Dollars/New Partners* participant; Trinity Church in Boston, a *Partners-consulted* congregation; Mt. Auburn Cemetery in Watertown, Mass.; and St. John's Episcopal Monastery in Cambridge, Mass. are beginning the process of making LEED-based changes to their facilities.

Greening the Roof to Cut Energy Costs

ICE's Rudin explains that most of the 7400 congregations he has worked with have not approached their buildings with the

greenest of intentions. "Congregations want to save money. Generally speaking they are not that interested in the environment yet... I think that is changing with global warming and higher fuel costs, and they are leaning toward thinking environmentally as well, but it is pretty slow."

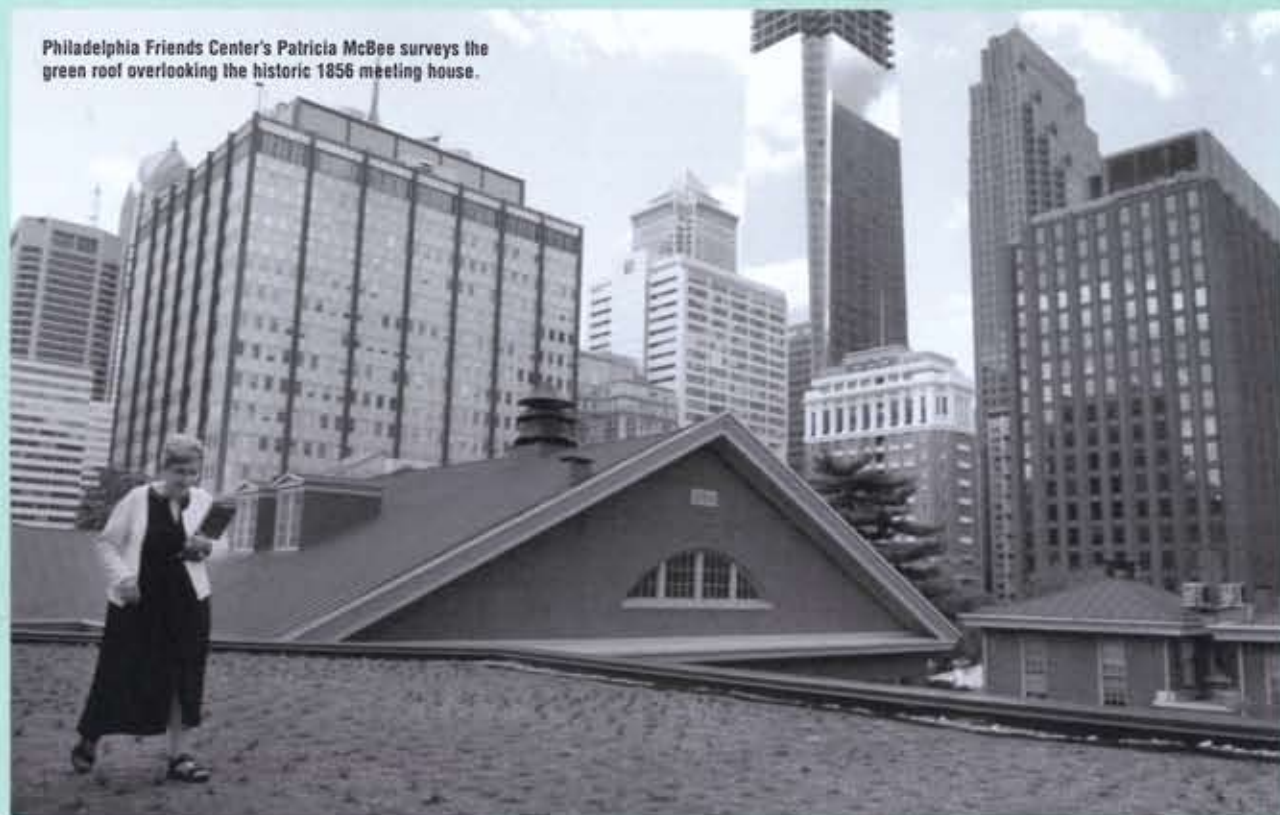
Patricia McBee agrees. When the Quaker Friends Center in Philadelphia attempted to tackle the major renovations for its administrative building, the finance committee first planned to replace the heating system, the roof, and the mechanical systems as needed and as finances permitted. McBee, the capital campaign director, says the committee's perspective changed as it realized that there might be some economic synergy out of a comprehensive renovation. "We were not thinking 'green building.' We did not have that vocabulary; but a couple of board members who did kept saying 'it is the twenty-first century and we need to pay attention to environmental repercussions.'"

After convening energy, interior design, and heating and cooling experts for a discussion with board and meeting members, Friends Center began installing a vegetated roof in late 2006. The 8,000 square foot green roof is covered in Pennsylvania sedum sprouts, situated atop four inches of soil. In addition to insulating the building, the green roof will indefinitely extend the life of the underlying roof since ultraviolet rays, hail, and acid rain will not make contact. "Other (vegetated roofs) have not needed to be replaced yet," she comments. "The roof gardens on Rockefeller Center go back for more than 70 years!"

The congregation installed solar panels in 2006 as well, which currently generate a portion of the center's electricity. Additionally, the center is scheduled to begin drilling geothermal wells this fall, to use the relatively constant temperature of the Earth's interior to heat and cool the building. The Friends plan to capture the rainwater from the 1856 red brick meetinghouse, and use it to serve the restrooms in both buildings. According to their engineers, this should reduce the use of potable water by 90%.

Friends Center also is using recycled and sustainable materials, and making an effort to utilize local materials low in toxins, glues and paints. It expects to qualify for gold level LEED status once the building is rated.

Philadelphia Friends Center's Patricia McBee surveys the green roof overlooking the historic 1856 meeting house.



McBee adds, "We discovered that our fundraising prospects soared.... The prospect that this would be able to be a model for changing building prospects was appealing. As we moved forward and had an impact, then donors who were at first reluctant were now interested." When the fundraising committee started the capital campaign within the congregation, "people gave the most they have ever given."

Invisibly Heating and Cooling a National Historic Landmark

Trinity Church in the City of Boston is an 1877 H.H. Richardson masterpiece located in historic Copley Place. Recently the Episcopal church undertook a major restoration and expansion project that included the construction of a new 22,000 square foot meeting and gathering space in a former service cellar beneath the church. While the project has not sought certification under the USGBC's LEED program, the architects, Goody Clancy of Boston, specified the use of

recycled materials and local/regional materials for the work. All of the building's storm water runoff is contained on-site.

In addition, the congregation installed new geothermal wells. Director of Communications Patricia Hurley explained this groundbreaking project began simply as a need for an energy efficient and invisible method for heating and cooling. "We have National Historic Landmark status, so we can not have an HVAC system outside of the building or in the sanctuary. Our committee looked at three different options, and the geothermal system won everyone over." She added that this fit into their religious belief system. "Being responsible for the environment is a pledge we take in our baptismal covenant. It helped us live up to the promise in a way that other options did not."

Though the geothermal system seemed an expensive option in the beginning, Hurley explains that the cost of installing a conventional system was comparable to installing the

geothermal system after examining the cost models. Goody Clancy notes that once the geothermal system is installed, it uses 40% less energy than a conventional system.

Trinity Church drilled six wells around the building, 45 to 75 feet apart. "Even if someone was looking for it, it would be hard for them to discover where they are. There are a couple of small plates at the base of the steps going out to Copley Square, and they are easy to miss. Meanwhile, those wells are 1500 feet into the earth."

Reclaiming Water for a Sustainable and Historic Landscape

The 175-year-old Mount Auburn Cemetery in Watertown, Mass. adopted sustainable design principles because, "it's the right thing to do. Our role should be one of educating others and being responsible for our impact on the environment," says Vice President of Operations & Horticulture David Barnett, Ph.D. Congregations can adopt many of this National Historic

Landmark's practices to care for grounds and cemeteries.

Mt. Auburn started with its landscape about 10 years ago and has virtually eliminated the use of all chemical fertilizers. It has found a cost savings in materials and labor by allowing the fallen leaves to remain. With the advances and design improvements in modern mowers and blades, maintenance procedures have been altered dramatically. Previously, the staff removed leaves and composted them for mulch. Now the material is pulverized in place allowing the natural organic matter and nutrients to return to the soil. "It's obviously an old system, and in many ways we have gone back to the future," Barnett reflects.

Water is the most important factor in landscaping. Mt. Auburn tries to be as efficient as possible and endeavors to do more. Currently, it harvests rainwater from its greenhouse roofs and stores it for watering flowerbeds. Over the last few years, Mt. Auburn has gathered thousands of gallons of rainwater, and while it wants to conserve more, the cemetery is currently hindered by a lack of storage capacity. Old sprinklers have been replaced with low-emitting sprinklers and low-flow toilets and fixtures have installed in the new building and in public restrooms. As Mt. Auburn moves forward, handling water will play a big role in all actions and decisions.

Starting Small to Reap Big Benefits

While these green projects involve years of planning and patience, many cost-saving and environmentally sound methods can be instituted more quickly. Trinity Church installed energy-saving light fixtures and operable windows for improved natural ventilation; each of these initiatives is a major component of the LEED rating system.

The Friends Center has learned that reducing energy begins with the "envelope" of the building. The congregation is improving insulation of exterior walls and installing high performing glass windows in the 1974 administrative building, which allow for more light and less heat from outside. By reducing the heat gain from the windows and the light bulbs, the

building will require less air conditioning. The Friends also plan to mount smart sensors, to automatically activate the electrical lighting on an as-needed basis. The nineteenth century meeting house retains many of its original glass windows, and no artificial light is needed on most days because of the abundance of natural light.

The Friends Center has invested in 100% renewable energy since 1999, and is teaching the occupants of the building to respect the "plug load policy" by considering the amount of energy used and duration of time necessary for equipment connected to outlets.

Mt. Auburn Cemetery has an organization-wide recycling system but hopes to do more with the buildings. Barnett shares, "There are cost savings, certainly, but it is not only about doing it, it is also about educating people."

If a building is already existing, it is probably the greenest it can get, rather than opening up a hole in the ground and dropping in a new church.

— Andrew Rudin, project coordinator for the Interfaith Coalition on Energy in Philadelphia, Penn.

Benefits of LEED-Certified Buildings

There is a misconception that older buildings consume more energy than new construction. According to ICE's Rudin, energy use in newer buildings costs more per square foot than older ones. He attributes that to installing air conditioning in targeted rooms versus installing central air conditioning for a whole building. "From a fuel standpoint, newer buildings use less fuel, but from the electricity standpoint, they use more per square foot."

Implementing environmentally sustainable changes, however, is more cost-effective for religious buildings over

a period of time. The USGBC states that LEED-certified buildings have lower operating costs and increased asset value; reduce waste sent to landfills; conserve energy and water; reduce harmful greenhouse gas emissions; and qualify for tax rebates, zoning allowances, and other incentives in hundreds of cities.

McBee states that using figures from energy modeling in conjunction with the energy price projections over the next 20 years, the congregation realized it would save \$5 million by choosing the green route. "All of a sudden the 'money people' are pushing the environmental strategies! At that point, for us, the real message is 'you are going to spend this money. What do you want to spend it on?'"

"In less than 10 years, the energy strategies will have paid for themselves."

Next Steps

Getting started may be a daunting task, but McBee advises hiring a green contractor from the beginning. "It makes every difference in the world to have your professional advisors be companies who already are committed to this. Because they think creatively about they might invent a new green strategy that just suits your circumstances."

The design team hired by Society of St. John the Evangelist, Saint Francis House (SSJE) is facing the challenge of developing a system to manage 100% of the storm water. Additionally, HKT Architects are determining how to retrofit energy-efficient mechanical systems into the historic fabric of the Romanesque Revival monastery. Designed by Ralph Adams Gram with a landscape plan by Fletcher Steele, the complex includes the monastery, chapel, and guesthouse situated in an urban environment. The goal to adopt sustainable design principles in the restoration and expansion efforts represents the largest capital improvement project since the building was built in the 1930s. Phasing the work to meet funding and operating constraints while at the same time pursuing environmentally responsible green design was important to the Anglican monks who call it home.

The design process helped them to align cost with their overall business and ministry objectives while sensitively incorporating sustainable design into this historic structure. It is projected the project will follow the LEED certification process with particular attention paid to the proper use and disposal of building materials.

Hurley says that like any construction project, the process takes patience, and especially because green design is such a new technology. "We were willing and ready to be part of discovering how it can best work... We knew we were on the cutting edge of something, so it does take awhile. It's wonderful to know we're helping advance this technology for others as well."

McBee explains that the Friends meeting had concerns about whether proposed green technology was reliable, testable, and would have promised outcomes. The finance committee was concerned about the cost as well, and to what extent green renovations would add to the cost of the renovations. "It has been a slow and painstaking process, but one that miraculously brings together disparate points of view—environment, money, priorities—that finally come together on a plan around which what we have what we call unity. It doesn't mean everyone agrees on every single detail, but everybody agrees that we have a plan that's right."

Trinity Church agrees. Hurley states, "As a landmark building, one we want to try to preserve as authentically as possible, it can be challenging to find a green alternative, but it was a priority for us wherever possible that we were making green choice. For any historic buildings there are options that you may not even know exist out there that can help increase your building's green factor."

Co-contributor W. Eric Kluz, AIA, LEED-AP, is a principal of HKT Architects Inc. of Somerville, Mass. and the past president of the District Presidents Association of the Unitarian Universalist Association of Congregations. For more information about building a green sanctuary according to the LEED benchmarks, visit the LEED web site on www.usgbc.org.

One Denomination's Approach to Green Building: Unitarian Universalist Action Areas

The USGBC and the Unitarian Universalist Association (UUA) have joined to promote and develop "Green Sanctuaries," places of worship that have responded to the environmental challenges through effective design, management and maintenance of facilities. As a critical first step the leadership of the UUA recently conducted an environmental summit during which a number of environmental issues and initiatives were discussed. Association President Bill Sinkford stated that "the organization is committed to a program to achieve certification of the four major facilities in Boston" and with the assistance of HKT Architects Inc., has engaged the services Sebasta Blomberg Engineers to develop an energy master plan that will result in improved performance and eventual certification under the LEED - EB program.

Action Areas

There are a total of 17 action areas adopted by the UU that congregations must address in order to achieve accreditation as a Green Sanctuary.

Area I. Energy Conservation and Environmental Practices

1. At least every five years, conduct an environmental audit of the church using the Green Sanctuary Manual as a reference, and make recommendations to the appropriate committees. If the church owns its building or can arrange a partnership with the owner, conduct a professional energy audit of all church buildings at least once every ten years.
2. Each year, challenge the congregation to achieve a target percentage in improved efficiency of energy use by the following year (at church and/or at home), until no further improvement can reasonably be expected. Include efficiency of transportation alternatives in the discussion.

Area II. Reduce, Reuse, Recycle.

3. Each year, separately weigh trash and recycled materials for at least one representative week and calculate the amount per church member. Each year, challenge the congregation to achieve a target percentage in reduced trash and increased recycling by the following year, until no further improvement can reasonably be expected.
4. Adopt a procurement policy for church supplies requiring price comparison with recycled alternatives and purchase of recycled products available at a cost within five (or ten) percent of the cost of the equivalent non-recycled product.
5. Adopt a policy requiring use of washable, non-disposable dishes, cups, glasses, and cutlery at church events.

Area III. Church Communication

6. Set up an Environmental Information Center in an appropriate place in the church and on the church website, if any, providing practical information on energy and environmental practices at church and home.
7. Include a Green Corner in the church newsletter with environmental tips and updates on environmental activities.
8. Identify, learn, and sing earth-based hymns and songs; perform environmental skits; and engage in other creative ways to keep environmental issues before the congregation each month of the year.
9. Hold at least one ceremony each year honoring those who have participated in Green Sanctuary work.

Area IV. Religious Education

10. Teach at least one child environmental course per year.
11. Conduct a Simplicity Circle, a Responsible Consumption Study/Action Group, or another adult education group focused on environmental concerns.
12. Lead an annual field trip to a power plant, recycling facility, landfill, incinerator, organic farm, or other facility.

Area V. Worship

13. Dedicate at least one Sunday worship per year to the environment.
14. Request that the minister and/or worship committee incorporate environmental prayers, meditations, or readings in regular worship.

Area VI. Environmental Justice

15. Contact local and regional environmental justice organizations, and commit to a partnership for work on a specific issue for the year.
16. Pass an all-church resolution committing to an all-church environmental project for a year, and carry it out.
17. Offer at least one environmental justice speaker, workshop, or program each year.