

A Showcase of Sustainable Design

A state-of-the-art multipurpose building, the Wister Center was completed in 2009 and houses a classroom, event spaces, greenhouses, and staff and volunteer support areas. In addition, the building showcases sustainable design and was awarded Gold LEED Certification by the U.S. Green Building Council in August 2010.



LEED gold medal plaque in entranceway

What is LEED?

LEED stands for Leadership in Energy and Environmental Design. The LEED Green Building Rating System was introduced in 1999 by the U.S. Green Building Council in order to improve the quality of buildings by reducing their impact on the environment. Green design can reduce overall energy consumption and operating costs, generate public health benefits, and help create a sustainable community.

A Sustainable Site



East facade

The Wister Center replaces an older greenhouse formerly located on the same site. By building on a previously-developed site and retaining a portion of the original structure's footprint, we reduced the amount of additional land that needed to be cleared for construction. In so doing, we were able to minimize the impact of the construction on the surrounding landscape.

In addition, the construction site was carefully managed to prevent runoff. By preventing soil erosion, we were able to protect local waterways from the sediment pollution often caused by conventional construction practices.



South facade

The Wister Center's central location and bicycle-friendly amenities also support site sustainability by encouraging alternatives to automobile use. The Center is located just a short distance from the Swarthmore train station, so visitors may take advantage of public transit rather than driving. In addition, bicycle racks and a shower have been installed at the Wister Center, making it easy for staff and volunteers to travel to the Scott Arboretum by bike. Finally, one parking spot in the Wister Center's lot is reserved for low-emitting and fuel-efficient vehicles.



North facade

Water Efficiency

Harvesting and recycling rainwater are great ways to conserve a precious natural resource while lowering utility costs. A 7,000-gallon cistern was installed underground behind the Wister Center capturing and storing rainwater from the roofs. This water is used to irrigate the nearby Terry Shane Teaching Garden. Overflow from the cistern is channeled into the BioStream, a stormwater infiltration garden that allows water to percolate gently into the ground through a drainage bed planted with native shrubs and perennials.



Jeff Jabco lifts up a bucket of sedum clippings to be planted on the roof

A green roof installed atop the flat area of the Wister Center roof will also collect a portion of the rainwater that falls onto the building, further reducing runoff and providing a host of other benefits as well. This green roof will capture and process about 60% of the rainfall on the building and is vegetated with a mix of sedums. In addition to mitigating storm runoff, the green roof will provide a layer of living insulation, reducing the Center's cooling energy requirements.

Furthermore, the green roof plantings support wildlife by providing habitat for songbird and insect species.

Water efficiency has also been maximized within the Wister Center itself through the use of high-efficiency faucets, toilets, and shower fixtures.

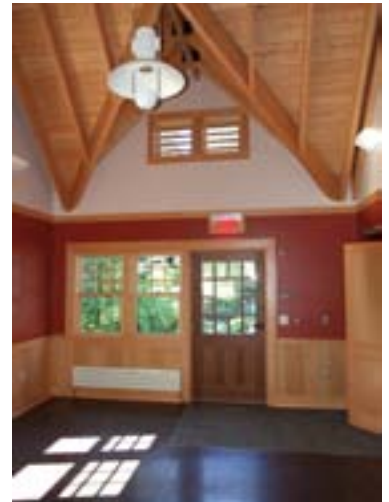


Planting sedums on the Wister roof

Energy-Efficient Design

The Wister Center has been designed as a highly energy-efficient structure; in fact, the building uses 17.5% less energy than a conventional building of the same size. This energy-efficient design allows us to conserve non-renewable fossil fuels and reduces the pollution associated with energy extraction.

The use of energy-efficient lighting reduced the use of electricity substantially. The majority of the lights in the Wister Center are T8 fluorescent or compact fluorescent (CLF) lamps. CLF bulbs use 75% less energy and last about 10 times longer than traditional incandescent bulbs. Occupancy sensors throughout the building turn lights on when movement is detected and shut them back off after several minutes of stillness.



East entrance foyer



The Wister Center maximizes the infiltration of daylight, both reducing electricity use and providing a pleasant environment for occupants. The building features numerous large windows, allowing ample daylight to enter and providing great views into the gardens. Additional daylight enters the Wister Center through four light tubes, which capture light through a dome on the roof, funnel it through a reflective-lined tube, and finally project it through a transparent ceiling lens.

An innovative heating and cooling system also allows us to save energy. This unique system uses the campus's chilled water loop to heat and cool the building. In the summer, excess heat in the Wister Center is absorbed by the water loop, lowering the Center's temperature and reducing the need for air conditioning. During the winter months, the Wister Center collects the water loop's excess heat, raising the interior temperature and minimizing the need for additional heating.

The George and Maralyn Orbison Gillespie '49 Room, set up lecture style (above) and meeting style (right)



Sustainable Materials and Resources

The Wister Center is an example of creatively recycled materials. The wood shingles on the east facade of the building provide one of the most visible – and unique – examples. These shingles were milled from dawn redwood (*Metasequoia glyptostroboides*) trees felled for the construction of the Alice Paul Residence Hall. A total of 381 sq. ft. of these shingles was installed on the east side of the Wister Center, giving new life to our old dawn redwood trees and contributing a truly beautiful element to the building.



Metasequoia shingles

The use of recycled materials extends all the way to the Wister Center's foundations, where over 8,000 tons of specially-mixed fly ash concrete were used to form walls, piers, and slabs. Fly ash is a fine, glass-like powder recovered from gases created by coal-fired electric power generation. U.S. power plants produce millions of tons of fly ash annually which is usually dumped in landfills. The use of this by-product reduces the amount entering our landfills, and actually increases the concrete strength as well!

We also sought to make sustainable use of all new materials used in construction. For example, over 40% of the lumber in the building is certified by the Forest Stewardship Council (FSC), indicating it was harvested from a well-managed forest and processed in an environmentally responsible way. Attractive FSC-certified Douglas-fir (*Pseudotsuga menziesii*) decking, molding, and framing has been used throughout the Center. In addition, FSC-certified medium-density fiberboard (MDF), an engineered wood product, was used extensively in construction.



FSC certified lumber

Throughout the demolition of the old greenhouse and the construction of the new Wister Center, non-hazardous waste materials such as paper, glass, plastic, wood, metals, and even rubble were collected and delivered to a recycling center. These materials were reprocessed and reused in a variety of ways.

For example, reusable wood was transformed into pallets and crates. In total, we diverted over 85% of the project waste from landfills and incinerators.



West entrance

Innovation and the Design Process

LEED-accredited professionals and contractors guided our efforts to achieve LEED certification for the building. The design for the Wister Center was developed by Archer & Buchanan Architecture, Ltd. of West Chester, PA; the engineering firm of Bruce E. Brooks & Associates designed the Wister Center's energy-saving heating and cooling systems; Gilmore & Associates, Inc. developed the Center's stormwater management systems; our general contractor for the project, W. S. Cumby Inc., oversaw project logistics and managed all aspects of LEED compliance. This talented team of professionals helped us bring innovative ideas to life and made our dream of a truly "green" greenhouse a reality!



To learn more about green design at Swarthmore College, visit the Science Center, the first undergraduate science facility in the nation to achieve LEED certification in 2005.

About the Scott Arboretum

The Scott Arboretum is a green oasis uniquely situated on the Swarthmore College campus. Over 300 acres create the College landscape and provide a display of the best ornamental plants recommended for Delaware Valley gardens.


Established in 1929 as a living memorial to Arthur Hoyt Scott, Class of 1895, through a bequest from his family, the Arboretum continues to thrive today on campus and in over 15 separate gardens. There are over 4,000 different kinds of plants displayed, selected for their outstanding ornamental qualities, ease of maintenance, and resistance to disease. Major plant collections include: flowering cherries, crabapples, hollies, lilacs, magnolias, tree peonies, rhododendrons, hydrangeas, conifers, vines, summer flowering shrubs, viburnums, and witchhazels.

Maps and specialized brochures on plants growing on the campus are available at the Arboretum office, which also houses a horticultural reference library. The Arboretum grounds are open from dawn to dusk year-round. Admission is free. The Arboretum is supported in part by the Associates of the Scott Arboretum, a membership group.

For additional information, call 610-328-8025, Monday to Friday, 8:30 – noon and 1:00 – 4:30.

This brochure was written by Shari Edelson designed by Laura Stiebitz.

Photos by Archer & Buchanan unless otherwise noted.

 **THE SCOTT ARBORETUM
OF SWARTHMORE COLLEGE**
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The Wister Education Center and Greenhouse



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