



# Nothing But Net



Winners of the **USGlass** Green Design Awards Push the Limits of Zero Energy and Beyond



**G**reen building, green designs and green construction are phrases often used loosely among the design and construction industry. Every building professes to be green these days, but what, exactly, makes it so? According to the Environmental Protection Agency (EPA), “green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building’s life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort.”

High-performance glass and glazing products play a significant role beyond their energy-saving benefits when it comes to green buildings. Glazing products can provide a high performance environment for the occupants, such as use of the space (view and daylighting, acoustics, etc); can minimize environmental impact; and provide renewable energy sources (i.e. photovoltaics), among others.

These points were all part of the criteria used in selecting the winners of this year’s Green Design Awards. The winners incorporate many of the design features enumerated by the EPA, and use glass and glazing significantly. They have not only earned at least some level of LEED® certification, but one is also seeking Living Building Challenge Certification (*see sidebar, bottom right*). These projects epitomize what a green building should be—and set the bar to which others will strive.

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## The EPA Says...

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation

## Gracious Green Gurus

Special thanks to the judges who assisted in the selection of this year’s winners.

- Tom Culp, owner of Birch Point Consulting in LaCrosse, Wis., and code consultant for the Glass Association of North America.
- Kerry Haglund, owner, Haglund Design Inc., LEED AP BD+C, based in the Minneapolis-St. Paul area.
- Arlene Stewart, president of AZS Consulting Inc. in Gainesville, Fla.



**Tom Culp**



**Kerry Haglund**



**Arlene Stewart**

## What is the Living Building Challenge?

Organized by the International Living Future Institute, the Living Building Challenge is a green building certification program that “defines the most advanced measure of sustainability in the built environment possible today and acts to diminish the gap between current limits and ideal solutions.” Essentially, the challenge requires buildings to generate all of their own energy with renewable resources, capture and treat all of their water on-site and use resources efficiently for maximum beauty. It is comprised of seven performance areas called petals. These include:

- Site;
- Water;
- Energy;
- Health;
- Materials;
- Equity; and
- Beauty.

According to the organizers, petals are subdivided into 20 Imperatives, each of which focuses on a specific sphere of influence. This compilation of Imperatives can be applied to almost every conceivable project type, be it a building (both renovation of an existing structure, or new construction), infrastructure, landscape or community development.

Learn more at <http://living-future.org/lbc>.

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Photo: Jim Schaffer

## Phipps Conservatory and Botanical Gardens, Center for Sustainable Landscapes

Location: Pittsburgh

Architect: The Design Alliance Architects

Contract Glazier: D-M Products

Glass and Glazing Products and Suppliers: Solarban 60/Starphire glass and Sungate 500 clear/Starphire glass from PPG; glass fabricator, United Plate Glass; other suppliers, Kawneer Co. Inc., Lock Drives, NanaWall, Oldcastle BuildingEnvelope®

Surrounded by gardens, nature and the environment, everything about the Phipps Conservatory and Botanical Gardens, Center for Sustainable Landscapes (CSL) is green. In fact, the 24,000 square-foot building is striving to become one the world's first certified "Living Buildings," designed to consume zero energy. In addition, the project was awarded LEED Platinum certification from the U.S. Green Building Council (USGBC), earning 63 out of 69 possible points for a new construction under version 2.2. the project is also striving for four-stars Sustainable Sites Initiative certification for landscapes.

"The CSL was created to serve as a model for how we can work with nature to make our communities healthier, safer and more supportive of life," says Phipps executive director Richard V. Piacentini. "With our LEED Platinum certification, we are excited to earn the first of three rigorous building and landscape standards, showing the world just how inspiring and practical green can be."

Glass selection was critical to helping the center meet the certifications' standards for energy use, aesthetics, and human health and comfort. The project features triple-glazed, dual low-E, insulating glass, mechanically controlled operable windows and skylight, aluminum sunshades and interior light shelves.

Piacentini says PPG glass was specified for the project because "we wanted a low-E, high-performing glass that provided state-of-the-art solar and thermal control and energy

efficiency, while admitting maximum daylight."

Chris Minnerly, AIA, LEED AP, principal of The Design Alliance Architects, agreed.

"One of the key aspects of glass selection is to balance the solar heat gain coefficient against the visible light transmission to get the best overall performance," he explained. "The glass assemblies had to have the best UV transmission in certain light spectrums to facilitate the growth of plants." Minnerly specified two triple-pane insulating glass units (IGUs) to meet performance requirements in different parts of the building. Sungate 500/clear glass combined with Starphire glass was installed above the sunshade and light shelves, while Solarban 60/Starphire glass was used below.

The center is designed as a long, window-lined rectangle to allow daylight to penetrate into the deepest parts of the interior space. Heating and cooling losses are offset by a thermal well system that captures about 70 percent of the center's heating and cooling energy from the ground's consistent 57°F temperature. The remainder of the center's energy demand is satisfied through solar energy generated by building-integrated photovoltaic cells. Other glass-related energy performance features include: light shelves, louvers and overhangs to minimize summer cooling loads and contribute heat in winter; translucent window shades to reduce nighttime heat losses; and Brise-soleil screens and internal shades to reduce summer cooling loads and glare from low sun angles. The structure, which also houses the conservatory's administrative offices and education and research programs, meets all of its energy and water needs without drawing a single watt from the grid or tapping water from the city of Pittsburgh.

The CSL is a global showcase of green innovation. It not only produces all of its own renewable energy with solar panels, geothermal wells and a wind turbine but also treats and reuses all water captured on site. Additionally, the CSL is surrounded by a restorative landscape highlighting a wide variety of native plants and a green rooftop garden with a view of Pittsburgh's Oakland neighborhood. Other sustainable site features include a lagoon, rain gardens and constructed wetlands.