

# Communion and Conservancy

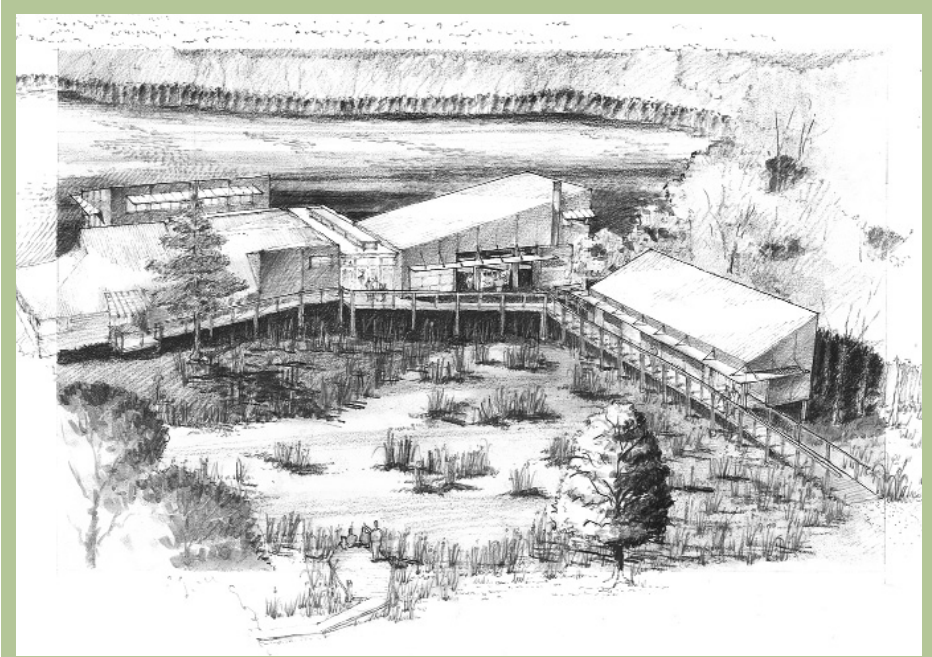
## BUILDINGS FOR PUBLIC GARDENS

*Andrew Herdeg and Ted Flato*

When one tugs at a single thing in nature,” said John Muir, “he finds it attached to the rest of the world.” True words. There is an undeniable common thread between all facets of our natural world, a linked significance that reverberates even from each bloom of a flower, flow of a stream, and fall of a leaf.

It is that connectedness that makes a walk in a garden such a pleasure. In any season, in any part of the country, walking through a natural habitat awakens our senses and heightens our awareness of just how intimately we are linked to the environment. Call it harmony, call it unity, call it communion, it is a feeling that architects who work in public gardens should recognize as the fundamental message that buildings within a public garden should communicate. Possibly more than any other building type, garden buildings need to respond to their particular place and intimately connect with their context in a sustainable way. In creating buildings for public gardens, one should remember that these buildings need to showcase, enhance, and serve as a backdrop to the plantings and relate to that particular environment in a seamless, beautiful, and functional way. Architects have many tools with which to work, but their greatest success is through the creation of architecture that renews an appreciation and respect for the environment through a spiritual and physical connectedness to the land. This renewal will in turn foster the long-term commitment to conservation, which often stands at the core of a public garden’s mission.

Each individual public garden rests in its own individual setting, and only when that context is explored and understood can the building truly be created to showcase the garden’s endowments. In “Where is the Wonder?”



Located a short distance from the Chesapeake Bay in Ridgely, Maryland, the Adkins Arboretum is dedicated to the stewardship of indigenous non-tidal plant communities of the central Delmarva Peninsula.

*I Wonder.*” (*The Public Garden* 18 (2), 2003), Iain Robertson asks how a conservatory can elicit a sense of wonder from its visitors. “The answer will depend on many factors...,” Robertson says. “...but to the greatest extent possible, let the plants speak for themselves.” The lessons of Robertson’s article can be applied to many man-made structures within a public garden context. The buildings should be a vehicle to “feed the hunger to be connected to nature....” Every step one makes in the programming and design process of garden buildings needs to be considered in the context of this mission.

Letting nature speak for itself is critical. Allowing visitors to experience the garden even while inhabiting a man-made structure is paramount to achieving that aim. A building is so much more than its program. Instead of the program, start with the institution’s mission, master plan, setting, landscape structure, geography, and plant assets.

All of these factors need to be considered for the connectedness to be evident and immediate. Most importantly, do not take a formulaic approach to design or the buildings themselves. Once the goals of the particular garden are understood, designing for and becoming familiar with site, context, and historic precedents can be factored into the building strategy.

### Building Design Standards

When designing any building, a smart, efficient, sustainable approach should be the priority. The LEED rating system is a helpful tool (*see article on page 29*). Whether the institution wishes to follow through with certification or not, the system provides a comprehensive and systematic process that can help ensure a more sustainable design. Furthermore, having a LEED-certified building raises awareness of green building and can be a source of great pride to those who sponsor the institution. By

integrating sustainable thinking at each step of the design process, the design team can help create buildings that are “of” the environment, not simply “in” the environment. By applying this approach to the entire process, the design team will consider the fundamentals: orienting the building to maximize breezes, optimizing exterior circulation, using recycled materials, as well as other more sophisticated strategies: conserving energy with the use of solar panels and rainwater-collection systems along with other forms of energy efficient and ecologically sound systems.

### Site Integration

Buildings have enormous impact on their sites. While the structure can play an important role in furthering the mission of the institution, it is the land that matters most. According to the needs of the program, the structure may serve as a gateway, leading people into the garden, or it may serve as a buffer between the urbane world and the more tranquil garden. It may simply provide people with places to sit and rest, to eat, to gather or to learn. It might require bathrooms and gift shops or classrooms, greenhouses, libraries, and administrative offices.

By analyzing the master plan, the design team can better understand if a structure should be an edge building, placed in such a way that it will strengthen the experience of the garden while providing the least impact on the site. Public garden buildings are often about transitions between one outdoor space or zone to another. They can be bridges, shelters, and at other times, walls. They can screen a parking area, a road, or a neighborhood. Yet, always maintaining the connection to the garden and remembering that the land is your most important asset are critical.

This goal of getting visitors into the landscape is not always easy. On a hot day, it's hard to leave an air-conditioned space to go outdoors. Various techniques help and promote conservation. Outdoor breezeways between buildings can accelerate breezes, keeping outdoor spaces cool while reducing interior space and circulation. Right sizing the buildings in a garden setting is a crucial step. A well

designed garden building must never be just a clunky edifice on the site; it should support and enhance the enjoyment of its environment.

A common problem for public gardens is the operation and maintenance of a vast building infrastructure. It is often worth taking a hard look at the building program, employing a creative eye toward space efficiency. In many cases, less can be more when it comes to buildings in garden settings. Can circulation be an exterior experience instead of an interior hallway? Can a second conference room be an open-air pavilion, and in turn, what new opportunities and experiences arise from these changes? Designs that break down building mass into more scaled elements can help a building fit into the environment, while reducing environmental impacts, material use, first cost, operating cost, and maintenance. In the end, integrating the structure and program into the specifics of the site and its context is critical.

### Environment and Context

Understanding the land makes a tremendous difference. Often, the architecture and the landscape architecture can work together to mend the land from man's past indiscretions. At the Stark Foundation's Shangri La Botanical Gardens and Nature Center in Orange,

Texas, a lake area that was home to over 5,000 herons had become stagnant and polluted. By constructing a wetland water purification system and integrating it into the building complex, we are able to cleanse the lake and restore its water-nutrient balance. The facility then uses the waste nutrient as compost for the garden, while using the constructed wetland itself as a prominently displayed public education tool. Likewise, rainwater collected from the buildings helps irrigate the site. Such resource-efficient systems can often solve more than one problem simultaneously and help the building tell a story about conservation. This level of integrated design will require a cooperative working relationship among the members of a broad design team as well as a comprehensive understanding of the land and the master plan.

Researching the territory and learning about vernacular materials, regional building techniques, and local craftsmen can also support the conservation of materials and culture. Examine and learn from local older buildings, which were adapted to the region and have lasted for generations. Whether it's a method of raising a building above a boggy wetland, designing to capture daylight or views while sheltering



Trammell Crow Visitor Education Pavilion at the Dallas Arboretum.





The multi-purpose space at the LSU Hilltop Arboretum is a simple open air pavilion that projects into a man-made retention pond. The pond was created to mitigate erosion damage in the adjacent ravine habitats and to create a landscape feature from a perennially marshy area on the small site.

from the intense sun or bitter north winds, warming through passive solar systems while shading with broad overhangs, or building with stone excavated from a local quarry, try to build with an environmentally and regionally specific mindset. The approach can even extend to those who physically work on the project. By employing methods and materials native to the particular region, one can avoid wasting the energy expended in transporting exotic materials from elsewhere and at the same time build upon the local economy and enhance the particular character of a place.

### Materials and Systems

A building can further advance conservation and strengthen the visitors' experiences and connections with the environment through the thoughtful selection of materials and building systems. Using recycled materials is one way. The Forest Stewardship Council (FSC) is a group that promotes the responsible

harvesting of timber and seeks to maintain forest biodiversity and productivity, while promoting ecologically sound forest management practices. The use of FSC-certified lumber is another way to support those sound practices.

Environmentally low-impact systems can also demonstrate and actively support conservation goals. Using helical piles—assemblies of mechanically connected steel shafts—creates foundations with less heavy equipment and less site impact than the concrete footings used in most construction. Photovoltaic solar collectors lessen the impact on the site, and help the building reduce its energy load by 10 to 15 percent or more. At times, with the use of photovoltaic panels and sustainable construction and design, a building can generate more energy than it actually uses, and thus feed energy back into a community's power grid. Other similar products include fly ash concrete, made from a by-product of coal-fired electric plants; Plyboo, a

product made of rapidly renewable bamboo that can replace plywood; or cotton batts, recycled cotton that replaces fiberglass insulation, can be used for construction materials and interior finishes and have recycled content or can be recycled. As well as being environmentally sound, materials should be simple, honest, easy to maintain, and durable. After all, we intend these buildings to last for generations.

Part of conservation is simply being resourceful; in other words, not spending money or expending natural resources where they are not needed. Instead of decorating a building with moldings and paint, allow the architecture to express its nature. The natural grain in wood or the texture of wheat board, a plywood-like material made from compressed wheat shafts, is fascinating. Allow it to create the texture and warmth to animate a wall. Exposing nuts and bolts of a structural connection, like the workings of a windmill or a watch, can reveal the wonder of the structure, promote the understanding of how the building functions, and also save the institution money.

At the Louisiana State University Hilltop Arboretum, a small library has walls sheathed with translucent cellular plastic mounted directly to the exposed wood framing, which also serves as the standards for the library shelving. As the sun streams in and the room fills with a gentle light, the architecture itself is revealed. Rather than a Sheetrock enclosed space with shelves and downlights, the space celebrates the structure and natural light, opening the visitors' eyes and minds, and even within this enclosed space, connecting them back to the environment.

At the Stark Foundation's Shangri La Botanical Gardens and Nature Center, photovoltaic cells integrated into glass panels create a roof as well as an interpretive exhibit—visitors can see the actual solar cells in action. Exposing systems visually reveals the parts they play in practical conservation processes and becomes another way we can connect and combine forces with nature to educate and delight.

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# WHAT IS GREEN BUILDING?

Robert Harris

Environmental awareness has become an important factor in how we perceive our world. We have all too recently come to the realization that building and development contribute directly and indirectly to many of the environmental problems we now face. New development displaces natural habitats and agriculture. It transforms our landscapes, consumes resources, and shapes the world we inhabit. According to the Department of Energy, buildings in the United States consume more than 40 percent of our total energy. As Sim Van der Ryn and Stuart Cowan wrote in the seminal book, *Ecological Design*, "In many ways the environmental crisis is a design crisis. It is a consequence of how things are made, buildings are constructed, and landscapes are used."

This new awareness has made green building a mainstream movement that seeks to significantly reduce the negative environmental impacts of development. The term "green building" is synonymous with "sustainable development" and requires a holistic approach to how we deal with land, materials, energy, and water. Its goal is to improve the health and sustainability of natural ecosystems and communities for this generation as well as those to come.

## What is the USGBC? What is LEED?

Formed in 1993, the nonprofit U.S. Green Building Council (USGBC) has led a national consensus to produce a new generation of high performance "green buildings." As the only national coalition that represents the entire industry on sustainable development issues, the Council brings member architects, builders, engineers, landscape architects, owners, developers, and planners together to develop industry standards, design guidelines, policy positions, conferences, and educational tools to support sustainable development practices.

The USGBC developed the Leadership on Energy and Environmental

Design (LEED) Green Building Rating System to address the growing need to provide a system to define and measure what should qualify as a green building. LEED is a voluntary, market responsive system seeking to strike a balance between established green practices and emerging concepts. The primary rating system currently in use by the Council is LEED for New Construction and Major Renovations (LEED-NC Version 2.1).

## How does LEED work?

The LEED rating system is performance based. Points are earned for satisfying performance criteria within five Environmental Categories:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality

An additional category called Innovation and Design Process covers sustainable development practices not covered by the five primary categories. A variety of points can be gathered based on the strategies chosen in each category. Different levels of green building certification (certified, silver, gold, platinum) are awarded based on the total points earned.

All commercial building projects are eligible to apply for LEED Certification. Project teams interested in gaining a certification should register their project with the USGBC at the beginning of the design process in order to maximize the green building and certification potential. It is important to note that LEED involves more than just the designers of a project. It actively involves the client/owner, facilities managers, users, and builders. It is a process that breeds not only smarter, greener development but also better equipped building owners and occupants.

The most important factors in realizing economically and sustainably developed projects are setting clear goals, incorporating sustainable features early in the process, and consistently working to stay on track. To this end,

LEED encourages project teams to utilize the Integrated Design Process. This process includes participants from all of the major project disciplines along with the project owners and users. By bringing this diverse expertise and interest together to deal with the building and site holistically, greater green building systems integration and cost efficiencies can be realized.

The integrated design team sets LEED and sustainability goals during the conceptual design phase. A LEED checklist is created to chart the sustainability goals under each of the main categories. The team checks the progress and makes necessary adjustments to achieve the stated goals at each subsequent stage of the design process. The USGBC provides a Reference Guide that includes detailed information for each credit along with an environmental issue overview, a summary of references, case studies, and possible strategies. Documentation supporting each of the credit points being applied for is developed during the design process and submitted to the USGBC with the certification applications at the completion of the project.

## Cost Savings

A common problem for building owners is the cost to operate and maintain facilities. Properly executed integrated green buildings perform better, last longer, and cost less to maintain in addition to reducing environmental impacts. The State of California's Sustainable Building Task Force study of 33 LEED buildings found that building owners paid an average two percent (\$3-5/square foot) more in first cost to achieve Certified and Silver LEED ratings while enjoying cost savings in energy, water, operations, and maintenance of 31 percent (\$15/square foot) over the life of the building. LEED Gold and Platinum rated buildings have shown significantly higher savings. Even greater savings can be realized when human health

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and productivity savings are factored into the equation. In the final analysis, users enjoy healthy buildings and sites while greater value is added to buildings that last over time.

**What is next?**

Currently, more than 1,700 registered projects are going through the LEED process in all 50 states and 13 countries, and 151 projects have achieved full certification. As LEED rapidly transforms the marketplace, USGBC's membership has grown to over 5,000 organization members. LEED is envisioned as a living document that is updated consistently every few years to meet the needs of a changing market. This year the USGBC is rolling out two new rating systems: LEED-EB for existing buildings and LEED-CI for commercial interiors. Future LEED rating systems are under development, including LEED-H for Housing, LEED-CS for Core and Shell, and LEED-ND for Neighborhood Development.

The USGBC is rapidly achieving its goals for LEED and many of its other endeavors. LEED has established high standards and a new benchmark for green building. Just five years ago, green building was hard to define. It is now difficult to discuss sustainable design without reference to the accepted LEED standards or the subsequent support tools now emerging. With achievable pay back of sustainable features, lower operating and maintenance costs, healthier workplaces, and other increased values, green building has become not only the right thing to do, but the smarter way to build. To find out about the USGBC and LEED, visit: [www.usgbc.org](http://www.usgbc.org). **TPG**

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