LakeIFlato: Sustainable Design Principles

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Based on a presentation by Bob Harris, FAIA

LakeIFlato

LakeIFlato is an architecture firm located in San Antonio, Texas. In projects throughout Texas and the United States they have repeatedly demonstrated an exceptional level of dedication to high-quality sustainable design, resulting in numerous design awards. Their thoughtful treatment of nature, material, and place has established them at the forefront of their field. In this article Bob Harris, a partner at LakeIFlato, presents some of the principles that guide their design and shows how those ideas are applied in several projects.

Belief in sustainability

Sustainability strives to satisfy the needs of the present without sacrificing the livelihood of future generations. Employing sustainable strategies enables architects to design high performance buildings with healthy built environments that conserve energy and natural resources. These laudable goals enrich and enhance life. Sustainability should be viewed within the framework of its locality. Regionalism is the basis for the beliefs and design of LakeIFlato. Looking individually at a project and analyzing its regional context and forces allows good architects to maintain and support the natural condition.

Essence of design

LakeIFlato architects believe that, architectural design should be based on the main principles of nature, place, craft, and restraint. These four principles are embedded in every project and become the solid foundation for designing sustainably.

Nature

In each of the following projects, the built environment works in conjunction with the natural environment, not necessarily to blur the boundaries between where one ends and the other begins but to create linkages, between man and nature that fit the particulars of site ecol-
ogy. This tactic supports, bonds, and at times, mends the natural landscape. A heightened awareness of the land and a strong connection to the environment are thus created.

Passive and active systems such as solar energy, ventilation, and lighting can efficiently use the regional climate. For example, some projects have been built upon large foundation helical piers that are completely removable, reducing impact on the land. All projects should be oriented to either deflect or capture solar radiation. Efficient shading techniques and strategies create thermal comfort both indoors and out. Local plants and animals are supported and protected by the use of regional materials and landscaping, thus emphasizing the indigenous nature of the location.

Place

The sense and essence of a place can be drawn out through architecture. The architects of Lake|Flato strive to understand the unique features of each place, emphasizing them through design. They believe that every design detail is special in some way and that if they look hard enough they will find beauty and intrigue in everything.

Once a location has been thoroughly researched, they design and build the project in conjunction with the place by supporting and amplifying its unique elements. Using local new and reclaimed materials is just one sustainable aspect of a project. Creating some type of tangible connection to the local environment adds depth to the project. Using local materials and regional architectural languages helps to reflect the locality’s special qualities.

The ways in which people inhabit and interact with a particular place provide clues about how to successfully design for each regional context. A particular building type should become successful in a region because of the local material, layout, or construction technique used in that specific location. For example, Adobe construction has been used successfully in the south-west for thousands of years because the wide range between day and night temperatures makes thermal mass useful for maintaining consistently comfortable interior temperatures. The climatic conditions combined with the availability of the building material makes Adobe a unique and appropriate choice for that area. If this type of vernacular architecture was used elsewhere it would not perform to the best of its ability and the architects would simply be imposing the design on an inappropriate context.

Craft

Designing is not only about art and architecture, but also about the love of doing something well after it has been well thought out. Lake|Flato is very passionate about this motto, which is a major driving force for their firm. Each and every project is crafted to show the connection to and essence of the particular place and idea. On their website they state, “We embrace the nature of materials and find inspiration in the simplicity of industrial and agricultural buildings. We find fresh solutions for traditional problems.”

Each and every material, joint, strand of light, and view in their buildings reflects a devotion to craft. Some projects require shade, while others are organized around an illuminated focal point in a space. When light is used creatively it can make something mundane become very special. Light itself has many unique qualities that allows it to be used as a vessel for art, architecture, energy, and sight.

Restraint

Mankind has created an imbalance in our natural system through deforestation, pollution, overuse and other such actions. Good architecture can help to restore balance. Restraint is the center of this change. Using moderation with respect to materials, energy, and personal desires is the essence of sustainable design. Through proper education and design, we can slow the destruction of our environment and begin to create equilibrium. This process will span many generations, but change must begin now to ensure a livable future.

The use of design from the past does not necessarily derive from a longing for days gone by, but rather from a willingness to rediscover and utilize forgotten knowledge. Function and design were simplistic and efficient before the technological age, but many of the basic principles that informed building for centuries have been lost today. The Farmers Almanac provides an example of this early knowledge and design. By using the charts and tables in the Almanac, people were able to plan for the seasons and live efficiently throughout the year. Food was stored, crops were planted, and buildings were oriented according to the climate information given. In those cases, people and designs demonstrated appropriateness, a quality that we should strive to reclaim.

If the first move in a design is done incorrectly, then every aspect of the project will have to play catch up during the rest of the project. Good designers must be willing to take a step back to revaluate whether the proper approach is being taken treating each project as a unique situation, challenging ourselves to push beyond preconceptions to find an appropriate balance and natural fit. Only after all the parameters have been thoroughly researched and confirmed can a proper and appropriate design path be started.

Illustration of values

Lake|Flato’s portfolio illustrates their commitment to nature, place, craft, and restraint in a variety of ways. Projects such as the World Birding Center, Government Canyon, the Friend’s Meetinghouse, and Shangri La illustrate their ideas in action.
World Birding Center

The World Birding Center is an eco-tourism destination located in one of the richest bird habitats in the world, the lower Rio Grande Valley. In this project the architects wanted to do more with less. This intention led to the use of regional vernacular materials in order to respond to the harsh climate and minimize disturbance of the adjacent 1700 acre native habitat preserve.

Lake|Flato was able to achieve these goals by using vernacular materials such as local wood, masonry, and by using a structural arched metal roof that performed as both structure and roof panels. These elements have been historically used by people in the area and their use helps to create a close relationship to the site. "Remnants of our borderland past – from frontier forts and ranches, to the carefully tended architecture of an old river port – grace each bend of the storied Rio Grande." This vernacular language connects the World Birding Center to the history and character of its surroundings. While reducing steel consumption by 48% when compared to prevailing structural systems.

Connections to the site were critical, so Lake|Flato used outdoor circulation to encourage a physical connection between the site and the multiple buildings. The main building’s narrow footprint was oriented to minimize solar gain and create effective cross ventilation. Day lighting was used in conjunction with shading devices and large overhangs to create pleasant outdoor spaces. Efficient building designs combine with natural systems to create comfortable thermal spaces that are not reliant on artificial cooling, thus reducing energy use. Many visitors are drawn to this project because of its craft, materiality, and awareness of details. The subtle architecture strongly promotes the nature and life inside the center. To ensure the longevity of the complex, the program is flexible and the building materials require little maintenance allowing it to be efficiently used for years to come. When designing and building the center Lake|Flato kept the motto of the World Birding Center in mind, because they wanted the combination of design and sustainable elements to allow visitors to “Let Imagination Fly”.

Government Canyon

The Visitor’s Center for Government Canyon State Park is located in Helotes, Texas outside San Antonio on the edge of the Edwards Aquifer recharge zone.

This recharge zone supplies water to both Austin and San Antonio, Texas. The extruded design of Lake|Flato’s center mimics the language of the recharge line just behind the structure and acts as a gateway to the national park. It is placed along the recharge zone among fields of native grasslands and restored oaks in this 8,600 acre State National Park. The canyon has a rich ranching history and the center was placed along historical settler supply roughs. The goal of the project was to "...protect and restore the natural landscape while creating high-use, low-maintenance, and economical structures that reinforce the mission of the Natural Area."
The design team minimized the impact to the land by limiting landscaping and physical disruption of the site. The building uses massing and solar orientation to maintain thermal balance throughout the year. Superfluous material use, energy use, cost, and maintenance were limited through proper design. Indoor climate controlled spaces transitioned into open outdoor spaces that accepted summer breezes but also protected from direct winter winds. Local and natural materials were used to express the flavor of the region and capture the essence of former ranch sites. Materials and technologies used by early ranchers in cattle pens and fencing were abstracted and used throughout the project, while stone walls echo the historic stone fences found on site.

The building demonstrates sustainable water practices and tells the story of its water use to all visitors. Collecting rainwater and storing it in cisterns on site supplies the majority of its water needs. Minimizing water run-off and water contaminants was also achieved by the project. Water is conserved through the use of low flow fixtures and the absence of landscaping irrigation. These elements reduce the use of both ground water and energy.

"Rainwater collected from the project roof is filtered and used for both landscape irrigation and wastewater conveyance. The gravity-flow water system is coupled with solar-powered water pumps. All storm water runoff from parking lots is distributed through vegetated filter strips and retained on site."

Indigenous drought-tolerant and drought-resistant landscaping was used throughout the project. The cisterns, water tower, and water pipes are all exposed, demonstrating the essential qualities of water conservation to the public without being overpowering.

Included in the project are an exhibit hall, Texas State Park store, classrooms, offices, outdoor exhibit pavilion, amphitheater, and interpretive trails. The building contains lighting sensors and controls as well as daylight harvesting to minimize its need for maintenance and energy. The absence of artificial cooling was a gesture to the temperate local climate. Lake|Flato designed this building from the roof down giving it minimal structure and contact with the land. In 2007, the Government Canyon State Park Visitor’s Center was named and AIA Top Ten Green Project, and in 2006 it received the AISC Design Award.
Friend’s Meeting House

The Friend’s Meeting House located in San Antonio, Texas is a quiet, contemplative setting for meditation and worship for the Quaker community. This meeting house acts as a community center and was designed to be as simple and pure as their religion. The design was inspired by the functional and simple spaces of early meetinghouses.

The site chosen for this project was naturally covered by what are often thought of as “trash” plants but several native species such as acacia, mesquite and Hackberry trees. The overall site was neglected, but the clients worked hard to nurture it back to health. The native plants considered “trash” species were left on the property because the Quakers believed that the plants had worked hard to grow there and therefore had just as much right to be there as the Quakers. The existing mature mesquite and acacia trees were combined with new xeriscaping to reduce water consumption.

Silence and meditation are key elements of the Quaker religion, which presented a major challenge in the design because of its urban context on a busy site along a main street. To solve this problem, the architects stepped the building down into the site, granting it acoustic and visual protection from the chaos around.

“As one treads the circuitous path, the gradual arrival sequence allows the mind to settle, shedding the busyness of daily life until one passes through a heavy wood-slotted gate set in a thick limestone perimeter wall.”

Walls were constructed from locally quarried off-white stone that is commonly used in many buildings in the area. The L-shaped plan of the building creates a central courtyard for contemplation and shaded outdoor circulation. The building borrows from the tradition of vernacular wood frame and wood façade construction of traditional Quaker meeting houses found mostly in the East and New England.

The interior of the meeting house showcases local and sustainable materials. Horizontal cementitious panels derived from recycled paper are used for wall coverings and Homasote panels are embedded behind cedar slats in the ceiling for acoustical absorption, creating a completely sustainable and natural interior. Exposed wood trusses span the interior, forming a regional barn-like space. “Lake|Flato realized humility in its design by embracing a domestic scale, simple symmetry of forms, and unadorned, inexpensive materials, taking cues from traditional American Quaker meeting houses shaped by similar design conditions.”
The structure is clearly expressed throughout the project. The compression of the intimate classrooms transitions to the large, open meeting space. High clerestory windows combine with traditional windows on the North, South, and West sides of the building to capture breezes and naturally ventilate the spaces within.  

The drainage way in the rear of the property became the focal point connecting the building to nature. “In the meeting space itself, one can silently sense a warbler bounce between branches, the movement of translucent leaves, and shifting of light around you,” says Bob Harris. The project is well suited to the land and expresses the essence of Quaker spirituality. In 2008 it won the Texas Society / AIA Award, in 2007 the AIA San Antonio award, and in 2006 the Faith and Form of Religious Architecture award and the Wood Design Award.

### Shangri La

Shangri La Botanical Gardens and Nature Center is located in Orange, Texas on Adam’s Bayou. Shangri La was originally designed and built by H.J. Lutcher Stark. The 250 acre park was opened to the public in 1946. These botanical gardens became the focal point of the community, drawing thousands of visitors each year. Families and lovers would stroll through the gardens all year long. Twelve years after opening, a major freeze destroyed the original gardens and massive development in the area eventually combined with a hurricane to cause its complete demise. The gardens stayed closed for 50 years, until 2002 when plans to restore Shangri La began.

The project was the first in Texas and the 50th in the world to earn the U.S. Green Building Council’s Platinum LEED Certification for New Construction. The project preserves hundreds of acres of cypress / tupelo swamp and wooded uplands. A visitor’s center at the entrance to the gardens was designed to orient guests to the site with a display on the history and resources of the area. Nature education and research facilities include an outdoor education center, classroom pavilions, and bird viewing blinds that are all carefully situated within the preserve to provide hands-on learning opportunities.

Fallen trees on the site were milled and incorporated into furniture, structures, and elements of the meeting pavilion. Sunken cypress trees were salvaged from rivers in Louisiana and used for siding, slats on walls, fencing, doors, and gates. The orientation center was constructed from reclaimed brick material salvaged from an Arkansas warehouse built.
Lake|Flato restored the site in collaboration with Jeffrey Carbo Landscape Architects and MESA. The devastated heron habitat on site was cleaned and filtered. The oxygen-starved water was rehabilitated naturally through plants, fish, and natural materials. Most of the land was given back to nature, preserving natural habitats. Lake|Flato worked to build on the site with as little intrusion as possible. Helical pier construction with screw hook foundations placed the buildings gently upon the land. The classrooms were inserted into the bayou and are completely removable, thus minimizing impact on the land.

“Shangri La’s grounds and structures utilize many green design strategies. The overall buildings’ architecture and the efficiency of its equipment and lighting reduce energy costs by 70%. The proper orientation of the buildings for passive solar heating and cooling, optimized overhangs, soybean based spray foam insulation in the walls and ceilings, and window placement all contribute to the energy savings. In addition, the facilities have a closed-loop, geothermal heating and cooling system which pumps water from an 800-foot-deep well, allowing Shangri La to take advantage of the constant temperatures deep within the earth.”

Roughly 36 photovoltaic panels on the south sides of the roofs generate enough renewable energy to produce roughly 21% of its needed energy. Approximately 60,000 gallons of water are saved throughout the year by using waterless urinals, ultra low flow toilets, and low flow sinks.

Roof color, material and shape were designed to reflect the sun and reduce solar radiation. This approach creates natural cooling and eliminates the need for artificial systems. The parking lots on the site were made from reclaimed asphalt salvaged from the repaving of Green Avenue in the town of Orange, TX. Transportation was reduced and the local economy was stimulated by purchasing 49% of materials within a 500 mile radius of the site. During construction, over 79% of the waste was diverted from landfills and recycled. The directors of the Shangri La Botanical Gardens and Nature Center believe that the buildings radiates their mission to “Mentor Children of All Ages to Be Kind to Their World.” In 2008, Shangri La opened to the public and received numerous awards including the ASLA Awards for Louisiana and Texas in 2004.

Conclusion

From their base in San Antonio, Texas, the architects of Lake|Flato create “architecture that is rooted to its place and successfully merges with the landscape. In collaboration with their clients, Lake|Flato creates buildings that are tactile and modern, environmentally responsible and authentic, artful and crafted.” Lake|Flato has received nation-wide acclaim, receiving 51 state awards, 37 national awards, and being featured in 66 books and 112 publications.

For Lake|Flato, architecture is not only about designing, but also about the grand scheme and order of architecture. They believe that design for a place requires an understanding of the past, present, and future of that environment. Sustainability has a stronger connotation and includes the elements of multi-use, longevity, and minimal impact on the land from which it came.

“Lake|Flato's architecture can serve as a lesson for us all...nothing sensational or exotic, no visual fireworks of fashion, just architecture that intrigues the mind, delights the soul, and refreshes the eye with its elegant detail and simplicity. Timeless architecture needn’t shout...”

William Turnbull, FAIA

Notes

3. Ibid.
5. Ibid.
6. Ibid.
13. Ibid.
14. Ibid.
15. Ibid.
18. Ibid.
19. Lake|Flato Website. Accessed October 18,
Further Reading


Biography

Bob Harris has been an architect for 15 years and a partner at Lake|Flato for 8 years. During his time at the firm he has established expertise in bringing good design and sustainable practices together in buildings that respect nature, enhance place, and exhibit the craft of construction. He has more than 20 years of project experience with a focus on sustainability issues ranging from land preservation advocacy to sustainable urban design.

Bob is a partner with Lake|Flato and is also the firm’s sustainability leader. He is a LEED accredited professional and founding director of the USGBC Balcones Chapter in Central Texas. He is actively involved in a number of sustainable design and environmental organizations—he currently serves on the National USGBC Board of Directors, representing the South Central Region as well as Advocacy Co-Chair of USGBC’s Central Texas Regional Chapter.

The World Birding Center Headquarters in the Rio Grande Valley of Texas was honored by the American Institute of Architects’s Committee on the Environment for their 2006 Top Ten Green Projects as well as an AIA National Honor Award in 2007. This project for Texas Parks & Wildlife demonstrates Bob’s commitment to and achievement in sustainable design.

His article “What is Green Building?” was published in Public Garden, the journal of the American Association of Botanical Gardens & Arboreta, in 2004 and reprinted by the National Association of Women in Construction in their March/April 2006 magazine.