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LEED Gold Certification Awarded to Environmental Research and Educational Center on the Mississippi Gulf Coast

Grand Bay Coastal Resources Center's architecture teaches about sustainable design

JACKSON COUNTY, Miss., Aug. 6, 2010 – The Grand Bay Coastal Resources Center has been awarded LEED Gold certification by the U.S. Green Building Council. Headquarters for the Grand Bay National Estuarine Research Reserve (NERR) and Grand Bay National Wildlife Refuge staff, the $7 million, 20,000-square-foot environmental research and educational facility is the first state government-owned, LEED certified project in the State of Mississippi. It was designed by architecture firm Lord, Aeck & Sargent in collaboration with Studio South Architects.

The Grand Bay NERR, an isolated reserve on the Mississippi Gulf Coast, comprises some 18,000 acres of marsh, waters and coastal wetlands that are home to several rare plant and animal species as well as numerous commercial and recreational fish species. The land is owned and jointly managed by the U.S. Fish and Wildlife Service and the Mississippi Department of Marine Resources (DMR). Through its research and educational outreach efforts, the new facility supports the NERR's charter to promote stewardship of coastal resources using

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an integrated program of research, long-term monitoring, training and education. And, it does much more.

"Our new facility is one of the greenest buildings in the state of Mississippi, but even more important, it demonstrates our philosophy of environmental consciousness and shows visitors how natural building materials and sustainable design strategies and techniques can be used," said David Ruple, Grand Bay NERR manager.

To that end, the building itself is "a green demonstration facility that teaches through its architecture what sustainable design is about, showing how to develop land responsibly in sensitive areas," said Jim Nicolow, director of sustainability at Lord, Aeck & Sargent.

To begin with, the Center was constructed on a previously developed part of the reserve in order to reduce site impact. Because it is located in a hurricane-prone area – floodwaters approximately 10 feet high covered the site during Hurricane Katrina – the building is elevated 19.5 feet above sea level on a framework of galvanized steel trusses that sit atop pilings. Nicolow said this is a more environmentally friendly solution than bringing in dirt fill to raise the site, which would have altered its natural hydrology.

Center saves on water and energy

Water conservation and energy savings were important drivers in the building's design. According to Nicolow, the Center is projected to use 76 percent less potable water and 53.5 percent less energy than comparable conventional buildings.

To save on water, rainwater falling on the roof is collected in two 6,500-gallon cisterns and used for toilet flushing and washing salt water from the research boats used by the Center's staff. Nitrogen loading from failing septic systems represents a key environmental threat to the estuary. The Center boasts a greener alternative to conventional septic systems: an on-site, self-contained bio-filtration wastewater system that can treat up to 1,200 gallons of water daily

uses aerobic bacteria to treat the building's wastewater to tertiary standards. Porous paving systems reduce stormwater runoff, and a series of rain gardens collects excess runoff, helping to reduce soil erosion and the spread of pollutants.

Other water saving features include dual-flush toilets, low-flow faucets, waterless urinals, and restored native pine savanna landscaping surrounding the facility.

The building features several energy reduction strategies and technologies, beginning with its solar orientation. The larger expanses of eye-level windows and upper clerestories are directed to the north and south in order to reduce summer solar heat gains. Tilted awnings on the east and west windows block direct sunlight and control glare, while horizontal sunscreens and roof overhangs help shade the south-facing glass.

Inside, natural light floods 86 percent of the Center's routinely occupied spaces, with lighting controls harvesting the energy savings by automatically turning off artificial lighting. Operable windows coupled with an innovative "mini-split" air conditioning system allow individual control of comfort in the offices while helping to reduce energy used for air conditioning. A Dedicated Outdoor Air System (DOAS) with energy recovery efficiently provides fresh air to the Center's occupants. The building's high reflectance Energy Star metal roof reduces excess heat accumulation and was designed at an angle to accommodate a future solar panel array the Center plans to purchase with funds it has applied for through a federal Coastal Improvement Assistance Program.

Resiliency features protect Center from natural disasters

Another important sustainable aspect of the building's design is its resiliency features, which protect against damage or destruction from fire and hurricanes.

One of these features is the use of Firewise landscaping, which minimizes the impact of wildfire in areas where dwellings abut forests. Should a wildfire approach the building site, a combination of St. Augustine grass planted within a 100-foot Firewise buffer, and a special gravel path that allows rainfall to soak into the ground instead of running off, serve as a firebreak.

In this hurricane-prone area, Nicolow said that "passive survivability" was a key design driver. "With its elevated structure, extensive daylighting, operable windows with interior no-see-um screens (to keep them from blowing off during a hurricane) for passive ventilation, the building is habitable, even when power is interrupted for extended periods."

The Center also features windows rated to withstand winds of 150 miles per hour.

Environmentally friendly construction materials used throughout

The building is constructed from environmentally friendly materials. The exterior siding, which looks like cedar shake, is actually made of 95 percent recycled plastics, fiber and rubber. The siding is resistant to weather, mold and insects and is designed with a lifespan of 50 years or more, twice that of cedar. Beneath the siding is a baseband of fiber cement made from recycled wood fiber. Vanity countertops in the restrooms are made from 100 percent post-consumer recycled plastic containers.

Healthy, low Volatile Organic Compound (VOC) materials were used in the Center's interior, including GREENGUARD certified furniture, low VOC paints, adhesives, sealants and flooring materials. Many desks and cabinets are made of bamboo, a rapidly renewable source. Several green flooring products are featured, including high recycled content carpet, rapidly renewable cork tile, recycled rubber tile, and a cork-rubber composite tile. The exhibit area features a pine cone pattern made from cork tile and inspired by the work of local artist Walter Anderson.

The Center's three research laboratories feature durable, chemical resistant countertops made with wood from forests certified by the Forest Stewardship Council. The labs have a designated separate acid neutralizing tank for wastewater. Dedicated fume hoods and an air regulation system improve indoor air quality, and a hazardous and glass recycling pickup program helps to manage laboratory waste.

Center's design speaks to the Gulf Coast vernacular

In addition to designing an environmentally friendly building that would have minimal impact on the landscape, Lord, Aeck & Sargent created a building design with many elements inherent to historic Gulf Coast structures. Among them are low-slung roofs with deep overhangs, screened porches, hurricane shutters and a single-story structure on pilings.

"The Center is about creating a community for coastal research, so in order to achieve the feeling of community, the facility is designed with five wings that create a large courtyard with amphitheater-style seating for outdoor education and mingling," said Joe Greco, Lord, Aeck & Sargent president and the building's project designer. "It's a grouping of smaller building components united through a mission to save the coastal habitat and educate visitors – adults and children – about the ecology and habitat of the region."

The research wing includes a screened mudroom that connects the ramped loading dock to the chemistry, biology and microbiology laboratories used for research and stewardship projects that will help the DMR better understand and manage the state's coastal resources. The laboratories will be shared with researchers from around the country who come to study the environment at Grand Bay.

Another wing, known as the dormitory wing, supports the Center's facilitation of other researchers and educators to use the NERR as a "living laboratory," Ruple said. "Our staff

collaborates with many other organizations and universities that send researchers here to conduct studies at the Reserve."

The dormitory wing includes two bunkhouses, each sleeping eight, and two private rooms for long-term visiting researchers. The wing also houses a kitchen, living room and restrooms.

The education wing houses two classrooms and interpretive exhibits that pertain to the local ecology, which encompasses coastal bay, expansive saltwater marshes, maritime pine forest, pine savanna and pitcher plant bogs.

The other two wings house administrative office space for Grand Bay NERR and U.S. Fish and Wildlife Service staff.

The conditioned interior educational and research space is supplemented by the amphitheater-style courtyard, and an outdoor laboratory constructed as an open-air screened porch.

The Project Team
The Grand Bay Coastal Resources Center project team included:

- Lord, Aeck & Sargent (Atlanta office), design architect
- Studio South Architects (Pascagoula, Miss.), architect of record
- KEEN Engineering (now Stantec) (San Francisco), MEP/FP design engineer
- Cannon Engineering (Gulfport, Miss.), MEP/FP engineer of record
- Simpkins & Costelli (Gulfport, Miss.), structural and civil engineers
- RMI | Built Environment Team (Boulder, Colo.), daylight modeling
- Taylor Studios (Rantoul, Ill.), exhibit design and fabrication
- Rod Cooke Construction (Mobile, Ala.), general contractor

About Lord, Aeck & Sargent
Lord, Aeck & Sargent is an award-winning architectural firm serving clients in scientific, academic, historic preservation, arts and cultural, and multi-family housing and mixed-use markets. The firm's core values are responsive design, technological expertise and exceptional service. In 2003, The Construction Specifications Institute awarded Lord, Aeck & Sargent its Environmental Sensitivity Award for showing exceptional devotion to the use of sustainable and environmentally friendly materials, and for striving to create functional, sensitive and healthy buildings for clients. In 2007, Lord, Aeck & Sargent was one of the first architecture firms to adopt The 2030 Challenge, an initiative whose ultimate goal is the design of carbon-neutral buildings, or buildings that use no fossil-fuel greenhouse gas-emitting energy to operate, by the year 2030. Lord, Aeck & Sargent has offices in Ann Arbor, Michigan; Atlanta, Georgia; and Chapel Hill, North Carolina. For more information, visit the firm at www.lordaecksargent.com.

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