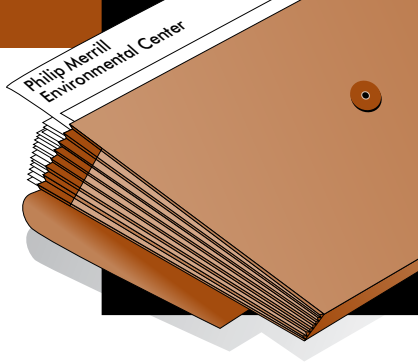

At Chesapeake Bay, Form Follows Function

Project Summary

PROJECT
Philip Merrill Environmental Center

LOCATION
Annapolis, Maryland

OWNER
Chesapeake Bay Foundation

STRUCTURAL ENGINEER
Shemro Engineering

ARCHITECT
SmithGroup

GENERAL CONTRACTOR
Clark Construction Group, LLC

COMPLETION DATE
December 2000

SmithGroup was interested in sustainable design long before it became popular. "We were committed to sustainable designs since the 1970s energy crisis," remembers Greg Mella, AIA, LEED AP, principal of SmithGroup. "When the 1980s came around, a lot of people didn't focus on energy-efficient buildings, so the lessons learned in the 1970s were forgotten. But we stuck with it, because we felt it was a good thing to do – good for the environment and good for building."

Consequently, when the Chesapeake Bay Foundation, a nonprofit organization devoted to protecting Maryland's Chesapeake Bay, looked to build a new, sustainable headquarters in 1997, SmithGroup was among only a handful of firms that shared their passion for sustainable design and won the job. As the team moved forward, every decision was based on whether it would result in a sustainable building that did not have a direct impact on the surrounding habitats.

"Our philosophy is that the greenest building is the least amount of building we truly need, built with the fewest number of materials," says William Baker, president and CEO of the Chesapeake Bay Foundation.

As a result, the construction materials of choice for the new headquarters were engineered wood products (EWP), says Mella. "Wood requires one-tenth the energy required to make a steel beam of the same strength. That's because to make the latter you must first collect scrap steel, transport it to the mill and

Reaching the apex of sustainable design, the Philip Merrill Environmental Center achieved LEED® Platinum status through inspired use of engineered wood products.

APA
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melt it down at very high temperatures. With engineered wood products, you use fast growing, under-utilized and less expensive wood species. You don't have to cut down an old-growth tree."

"We also wanted a warm-looking interior, so we liked the aesthetics of wood," Mella continues. "Combine our aesthetic preferences with the fact that we wanted to be environmentally friendly, and the solution was to use structural composite lumber (SCL)." SCL is a generic engineered wood structural lumber product family that includes laminated veneer lumber (LVL), parallel strand lumber (PSL), laminated strand lumber (LSL) and oriented strand lumber (OSL), and other wood composite lumber products which have similar engineering and configuration features. SCL products are used in the same structural applications as sawn lumber and timber.

The building was designed with EWP throughout – from its plywood subfloors to its roof and walls. Its structural skeleton features parallel strand lumber (PSL), which was left exposed. The second floor is framed with I-joists, while the skin of the building uses structural insulated panels (SIPs) with oriented strand board (OSB) sheathing on both sides.

The walls incorporate a series of 10-1/2-inch by 11-inch PSL columns every 20 feet that support a truss 25 feet above the first floor. Instead of using traditional framing from joist to joist, SIPs were installed between the 20-foot columns, spanning both floors and measuring 22 by 4 feet. These were clad with batten-seam metal siding. "The SIPs are very strong," says Mella, "so we were able to span these wide expanses using the SIPs alone. It is definitely a kind of skeleton-and-skin, structural system in which you have bones (SCL) and skins (SIPs)."

Oriented strand board ceiling panels and parallel strand lumber are visible in the center's interior.

A crane placed the panels into place on the roof and then covered them with a galvanized steel standing seam roof, resulting in a snow load capacity of 30 pounds per square foot.

"One of the risks in using a new product like a SIP is the contractor is not familiar with it and may be conservative," says Mella. "The advantage is that SIPs go up really quickly, like a barn-raising. There is no need to nail individual studs together and put sheathing on, so you pay more for materials, but wind up saving labor costs. It takes a contractor who is fluent with SIPs to realize that, and I think ours was surprised at how easily and quickly the building went up."

SmithGroup never performed a cost comparison for using dimensional lumber or steel, since neither were viable options. But the architect was happy with the final cost, which averaged $199 per square foot.

The most challenging aspect of the project was ensuring that it was as environmentally friendly as everyone hoped. "We had to understand the holistic environmental impact, so we looked at everything to make sure it was environmentally friendly," recalls Mella, noting that they even specified that the PSL be delivered to the site in recyclable kraft paper instead of plastic.

Today, the 30,000-square-foot, two-story Philip Merrill Environmental Center may be the world's "greenest" building. It is the first to receive the U.S. Green Building Council's Platinum rating for Leadership in Energy and Environmental Design (LEED®).

"We're absolutely delighted with it, and the owner is very happy," says Mella, noting that in a survey of 20,000 occupants of 150 buildings, the second highest scorer for overall building satisfaction – including aesthetics, acoustics, light and air quality – was the home of the Chesapeake Bay Foundation. The survey was done by the Center for the Built Environment at the University of California, Berkeley.

"The facility is a major recruitment tool," says Mary Tod Winchester, Chesapeake Bay Foundation vice president. "It has been a magnet for the audiences whose building projects we want to influence."

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