



# Chesapeake Bay Foundation: A Pioneer in Green Building

Building Technologies

**SIEMENS**

**“Siemens has really worked with us to implement a progressive natural ventilation system. Its technical expertise and innovative thinking continue to help us fine-tune and maximize the use of our natural ventilation system.”**

*— Roger Perry, Facilities Manager, Chesapeake Bay Foundation*



**The Philip Merrill Environmental Center, the Chesapeake Bay Foundation’s (CBF) headquarters, is located on Chesapeake Bay, near Annapolis, Maryland. For more than three decades, CBF has worked to “Save the Bay” through resource restoration and protection, environmental advocacy and education.**

Built in the year 2000, the Center is a 32,000 square-foot building, housing CBF’s staff and serving as a training facility for volunteers and a venue for special events. The Center is a global model of energy conservation, using both recycled and recyclable materials in the construction of the building. For example, the building’s beams are parallel-strand lumber, which is constructed from new growth, regenerable wood. Rainwater cisterns and composting toilets have cut CBF’s water usage by 90 percent. In fact, CBF was the first building to receive the U.S. Green Building Council’s recent Platinum rating for Leadership in Energy and Environmental Design (LEED), making it one of the nation’s “greenest” office buildings.

When it came to optimizing its building’s energy use, CBF turned to Siemens Building Technologies to create an environmentally-friendly building automation system.

### Client Objectives

CBF needed Siemens to install a building automation system to optimize the building’s energy use in many ways. The job scope included implementing a natural ventilation system, controlling pump speeds, optimizing heat pumps and lighting use, as well as continually developing energy-saving strategies.

### Siemens Solutions

- Siemens installed the APOGEE® building automation system and Insight™ 3.1 workstation. When air temperature and humidity sensors on the inside and outside of the building determine that the climate is suitable, the system goes into the natural ventilation sequence of operation. APOGEE shuts down or scales back the mechanical

systems, actuates windows open and turns on “open windows” lights within the building that signal employees to open their windows. The building is naturally cooled by the bay’s breezes, as compared to a traditional office building, which uses an economizer strategy to achieve natural ventilation.

- Siemens has further fine-tuned the natural ventilation system so it can be used on a “zoned basis,” versus having it either in the “on” or “off” mode for the entire building. CBF has found natural ventilation is used more often when it is a sunny day and the outside temperature is between 30° and 50°F. Under these conditions, Siemens reprogrammed the system so that the first floor is able to use heat, while the second floor uses natural ventilation instead of air conditioning to provide cooling for the heating load. The “zoned” natural ventilation sequence of operation was accomplished entirely through reprogramming the system; no additional mechanical equipment or wiring was required.
- In another energy conservation move, Siemens installed sensors on the doors of a glass-enclosed conference room. When the doors that lead out onto the deck are opened for more than five minutes, the system shuts off the air conditioning, and employees take advantage of the natural cooling offered by the bay’s breezes.
- The APOGEE system controls the circulators and the heat pumps that comprise CBF’s geothermal or “ground source” heating and cooling system. The pipes for the system are buried below the frost line so that CBF can take advantage of the earth’s natural energy to warm/cool the water, instead of having to use mechanical equipment to generate heating and cooling.

### Client Results

- CBF initially projected it would use the natural ventilation system approximately 10 percent of the year, but with Siemens tweaking and reprogramming the system, natural ventilation is used more than 30 percent of the year.
- The building reduces air pollution by using two-thirds less energy than a typical office building of the same size.
- Siemens is continually working with CBF to adjust, re-assess and reprogram the system to maximize the use of natural ventilation.

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