



HEIFER INTERNATIONAL | CASE STUDY

## Heifer International passes on gifts of sustainable incomes, hope and environmental stewardship

Heifer International in Little Rock, Arkansas, is a bank of “living loans.” In exchange for the non-profit organization’s gift of livestock and training to impoverished families—with the aim of improving their nutrition and generating income in sustainable ways—each family agrees to give one of its animal’s offspring to another family in need. It’s a process and a philosophy Heifer International calls Passing on the Gift.

In 2001, after years of renting spaces it quickly outgrew, the company decided to build its own world headquarters. The new facility would be home to more than 250 employees in more than 94,000 square feet of air

conditioned space, and set on 22 acres of reclaimed wetlands. The curved shape of the building reflects a dual mentality: The ripple effect of passing on a gift and the feeling

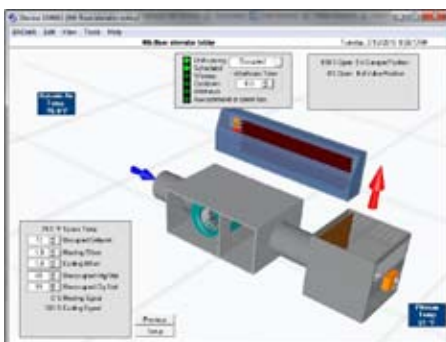
of Heifer International founder Dan West that the best decisions were made in a circle, with people facing one another.

Heifer International wanted to build a sustainable facility and achieve LEED Silver certification. One of the best ways to reach this goal was through its mechanical system. The company chose Northwest Controls to install an Alerton building automation system to control the heating, ventilating and air conditioning (HVAC) in its unique facility.

“This was our first major project where we all got to think outside the box,” said Erik Swindle, director of facilities management for Heifer International.

Being a non-profit, Heifer International required a three-, five- or seven-year payback on any system it installed in its new building. That meant the company needed equipment to start delivering an optimal performance practically right out of the box.

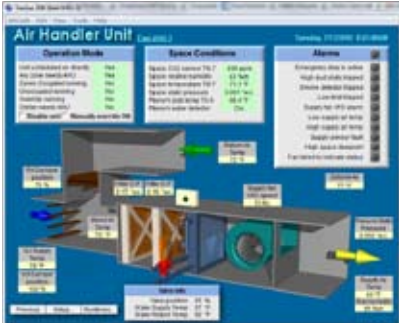
The company also intended for the system installed in the Little Rock headquarters to monitor and control all of its buildings across the country, including learning centers



Centralized control of several integrated systems inside Heifer International enabled the company to achieve LEED Platinum certification.

*From the design of the building to the design of the controls, each piece has a purpose. Nothing is just an architecture feature or a display. This building is a highly efficient, living, breathing machine.*

*Erik Swindle, Director of Facilities Management, Heifer International*



*An air handling unit, controlled by the EMS, efficiently managing the raised floor cooling system as well as natural convection cooling.*

in California, Arkansas and Massachusetts.

Most important for Director Swindle was to become familiar with the control system he chose, to know its capabilities and learn how to expand the system when the company chose to do so.

“My previous boss used to say, ‘If you don’t have your controls in place, you won’t run the building—the building will run you,’” Swindle said.

Northwest Controls installed Alerton’s BACnet®-based energy management system (EMS) that precisely monitors several systems Heifer International uses to create sustainability in its headquarters. The Alerton solution integrated a raised floor cooling system, perimeter natural convection heating system, a chilled and hot water distribution system, and a rainwater harvesting/gray water system. Northwest Controls also wrote a number of complex sequences of operations with direct digital control (DDC) logic to control the heating, cooling and greywater use.

Heifer International installed a raised floor cooling system as part of its efforts to reduce energy while still maximizing comfort and flexibility. The Alerton system controls variable air volume (VAV) units that use minimal pressure to distribute air—warmed as it rises from floor registers to return air ducts close to the ceiling—to air handling units for reconditioning and recirculation. Ventilation units that serve the VAV system use variable speed drives, which reduce the fan system’s energy consumption as part of the cooling process.

The EMS integrated the rainwater harvesting system inside Heifer International’s headquarters. The sloped roof channels water through 26 drain points. A flow meter at the harvested water’s entry point monitors how many gallons per minute (GPM) enter the building as well as how much water is in the 30,000-gallon collection tower. The EMS controls the system that filters the greywater and sends it up the building’s four stories where it is used for flushing low-flow toilets as well as for makeup water in the cooling tower. A chilled water system with a waterside economizer, also integrated into the EMS, controls this process. A plate-frame heat exchanger helps reduce the chiller’s load, enabling further reduction of the building’s energy use.

Swindle considers the EMS-controlled plate-frame heat exchanger to be one of the keys to the building’s efficiency. With the heat transition in Arkansas, temperatures can jump from cold to hot in the blink of an eye. The Heifer International building runs 24/7, with some employees beginning their day at 5:30 a.m. Swindle and his staff are able to program the building to start up at 5:00 a.m., using the heat exchanger, then transition to an 80-ton chiller. As the day progresses and warms up, technicians can shift to the 300-chiller, then at 5:00 p.m., step down in a reverse of the process, ending with the load-reducing heat exchanger.

Heifer International can manage 2.2 million gallons of water on site, including water generated by the surrounding wetlands, basin and pond. Once the tank reaches full capacity, overflow from the tanks flow into the wetlands around the building). Through its EMS, the company can easily determine when to use the water or when to release it to the wetlands.

At both ends of the building, the company placed two glass-enclosed staircases over water. This configuration enables the natural convection process to draw water-



*Heifer Village, a 14,000 square foot mixed use learning center with a fair trade gift shop, retail and exhibit areas, rental meeting space and a café, was easily integrated into the centralized EMS without losing any energy efficiencies.*



*Engineers tell us this is one of the most complex buildings they ever worked on. The system controls every little piece of our HVAC.*

*Erik Swindle, Director of Facilities Management, Heifer International*

cooled air up through the staircases. Monitored by the EMS, this air is efficiently moved and circulated.

The Alerton EMS enables Heifer International to operate efficiently and sustainably by integrating several systems that collectively contribute to significant energy savings.

According to Swindle, "We originally planned for a seven-year payback, but the HVAC system was paid for within the first 24 months of operation. The rainwater harvesting system, on a five-year payback, paid for itself in 11 months."

Even though Swindle and his team initially aimed for LEED Silver certification, Heifer International actually received the U.S. Green Building Council (USGBC) LEED New Construction (NC) PLATINUM rating and was the first building in Arkansas to do so. The building was also voted one of the Top 10 Green projects by the American Institute of Architects and its Committee on the Environment.

Heifer International headquarters was designed to provide energy savings of more than 52% over the ANSI/ASHRAE/IESNA Standard 90.1-2001, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.

According to Swindle, the typical monthly water bill for a comparable building is around \$3,000; Heifer International headquarters pays approximately \$600, which includes water used for irrigation. Because its rainwater harvesting system is so efficiently controlled by the EMS, the building

is able to use 2 million gallons less of potable water than a comparable building.

"We used to rent floors in downtown Little Rock and even more space in a 20,000 square-foot building," Swindle said. "Our new headquarters are cheaper to run than both of those buildings."

Swindle plans to tie other properties into the Little Rock EMS, including the server room, UPS system and generator in Perryville, Arkansas, the 10-acre learning center campus in Los Altos Hills, California, and a 270-acre working farm and learning center in Rutland, Massachusetts.

In 2005, Heifer International opened Heifer Village on the banks of the Arkansas River. The center, open seven days a week and free to the public, is a 14,000 square foot learning center that features a fair trade gift shop, retail and exhibit areas, rental meeting space and a café. The mechanical system inside Heifer International headquarters was designed from the beginning to add control of Heifer Village when it was completed. When the learning center opened, it was seamlessly integrated into the centralized EMS without losing any energy efficiencies.

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