

# Project Profile

## Andover Meets Unique Environmental Challenges at the Henry Doorly Zoo



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—Dr. Lee Simmons  
Zoo Director



A world-class facility in every sense of the word, Omaha, Nebraska's Henry Doorly Zoo attracts more than a million visitors each year. Along with polar bears, giraffes, elephants, lions and tigers, the zoo hosts the world's second largest indoor tropical rain forest and a 72,000 square-foot (6700m<sup>2</sup>) aquarium.

### Lied Jungle "Thrives" on Andover

Inside the *Lied Jungle* building, zoo visitors can experience the sights, sounds, and smells of a tropical rain forest as they walk along the ground level path or take a suspended walkway at treetop level for a bird's eye view of the tropical foliage, misty waterfalls, and jungle inhabitants. In 1992, Andover Controls Representative, *Control Services, Inc.* of Omaha, Nebraska, designed and installed an energy management system for this indoor rain forest. The Andover system provides all temperature and humidity control in the jungle, including operation of a misting-fogging system and full control of the two large central air-handling units.

The 200-point *Lied Jungle* project was a "lush" success as the Andover control system met an unusual environmental challenge with its unique programming flexibility. According to Chuck Kopocis, vice president at *Control Services*, "The design engineer felt the complexity of the sequences could only be handled by a control system capable of flexible decision-making. We wanted to simulate actual rain forest conditions by producing extreme humidity during the day followed by cool building temperatures at night—the *opposite* of what systems usually do. This project could only be done with a product like Andover's." Dr. Lee Simmons, the Zoo's Director agrees: "Infinity's flexibility allows us to maintain constant zoological conditions inside regardless of varying extremes in Nebraska weather outside. We are very pleased with the Andover system."

### Scott Aquarium— Infinity Comfort and Control in the Kingdom of the Seas

Two years later, *Controls Services* and Andover were back at the zoo ready to take on another control challenge. They installed an *Infinity* system in the zoo's new adjoining aquarium building, the *Walter Scott Kingdom of the Seas Aquarium*.

One of the world's largest aquariums, its visitors can walk through a glass tunnel in a 900,000 gallon (3.4 million liters) coral reef tank and view marine life, including sharks swimming all around them.

An SX 8000 graphic front end workstation, which uses Andover's built-in backward compatibility option, integrates the new *Infinity* system in the aquarium with the Andover AC256 control system in the jungle building. Along with controlling the building's HVAC system, *Infinity* is responsible for the life support system for 15 freshwater and saltwater exhibits, totaling more than 1 million gallons (3.8 million liters) of water, and a refrigerated penguin habitat.

The *Infinity* system not only monitors and controls the tank water temperatures throughout the aquarium, but also controls an elaborate 80-pump automatic backwash filtering system and a state-of-the-art ozone generation system, which injects ozone into the water to disinfect it.

The penguin habitat looks like a scene straight out of the Antarctica. Visitors can watch the penguins as they frolic in the snow and ice and swim in saltwater ponds with underwater viewing. *Infinity* controls the daily production of 14 tons of snow and ice and maintains the exhibit's air and water temperature in the 25-45° F. (-4.0-7.2° C.) temperature range necessary for penguin reproduction.

Throughout all the exhibits, the Andover system performs valve control to prevent salt and freshwater from intermingling and level control to compensate for tank water evaporation.

The animal life in the aquarium underwent a 6-month acclimation period in their new home before the aquarium opened in the Spring of 1995. During this period, *Control Services* was able to modify their control strategies to fit the aquarium's special needs.

According to Kopocis of *Control Services*, "Ninety percent of the time, making control modifications with the Andover system means just looking at programming it differently. We don't have to make a lot of expensive hardware changes. I think that's a big part of why we got the second job . . . we were willing to work with Zoo Director, Dr. Lee Simmons, and the product allows us to do that."

### IMAX 3D—*Infinity's* Movie Debut

The newest addition to the Henry Doorly Zoo is a 350-seat IMAX® 3D theater. Again, *Infinity* is "in control"—providing not only the VAV system control inside the theater, but also the actual cooling of the gigantic heat-generating IMAX projector itself.



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## PROJECT AT A GLANCE:

**Project Type:**  
HVAC

**Project Name:**  
Henry Doorly Zoo

**Location:**  
Omaha, Nebraska

**Market Segment:**  
Entertainment

**Number Of Buildings:**  
4

**Total Area:**  
190,000 square feet (17,450m<sup>2</sup>)

#### Andover Equipment Installed:

1 - CX 9000 network controller  
3 - SCX 920s  
15 - LCX 810s  
56 - TCXs  
1 - EMX 170  
1 - AC256 network controller  
4 - LCUs  
1 - SX 8000 workstation

#### Network:

Fiber optic connection between buildings

#### Applications:

HVAC control  
Climate control (Rain forest and aquatic display)  
Aquarium life support systems  
Automatic backwash filtering system  
IMAX theater cooling

**Total System Points:**  
650

**Andover Controls Representative:**  
Control Services, Inc. (Omaha)