

Nebraska Furniture Mart

CASE STUDY



Challenge

As Nebraska Furniture Mart planned its new Texas store, customer comfort, energy savings and demand avoidance were priorities. "Dryer air is more comfortable. We wanted to keep the humidity levels down to make our customers comfortable, and keep harmful moisture off the furniture," said Robert Kincheloe, Texas store facilities manager, Nebraska Furniture Mart. "In addition, with the energy grid nearing capacity, the area was plagued with rolling brown outs. We were building a very large facility. Of course we wanted to keep our utility costs down, but we also wanted to be good stewards to the community and not be the cause of additional outages."

Solution

Working with their architect, the general contractor, and Purdy-McGuire, an award-winning mechanical, electrical, and plumbing engineering services firm in the Dallas area, Nebraska Furniture Mart began a bid and interview process to select a supplier for its mechanical systems. "We chose Trane because of their quality, our comfort with their offering, and the confidence they had in their systems," said Kincheloe. "When we asked Trane to include the ten-year teardown cost that the other suppliers had in their bids, they told us that their systems were more efficient, higher quality, and would last longer; they didn't intend to tear it down in ten years. Their confidence made me feel good about our decision."

Investigating the options

Approaching the project with a "fifty year mindset", the team conducted exhaustive research to determine the right systems for the new building, spending time at the furniture company's store in Kansas City to understand their likes and dislikes, and touring other facilities. "We introduced the idea of thermal storage, and the group spent a hot, humid day visiting a facility where ice storage was in use," said Kip Hanzlicek, President, Purdy McGuire, Inc. "The lower humidity it could produce was important, and the ability to shave the peak load was enticing. Thermal storage was ideal for the long-term."

Nebraska Furniture Mart The Colony, Texas

PROJECT HIGHLIGHTS

Thermal storage system keeps shoppers comfortable, lowers utility rates, removes 1.6 megawatts of electricity from daytime grid.

With 2.2 million sq ft under roof, including a 565,000 sq ft retail showroom, Nebraska Furniture Mart's Texas location boasts the largest single retailer space in the world.

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Delivering efficiency and better humidity control

Designed to provide cool temperatures and low humidity levels for comfort, the two-story EarthWise™ Ice-Enhanced Chiller Plant includes three 1000-ton Trane® CenTraVac™ centrifugal chillers, one of which is redundant. The chillers offer efficiencies as low as 0.45 kW/ton at full-load conditions. Low chilled water temperatures enable the system to use cold air for smaller fans and ductwork, and smaller pumps and piping, reducing initial material costs and long-term operational costs, while delivering better humidity control.

Shifting demand to off -peak hours

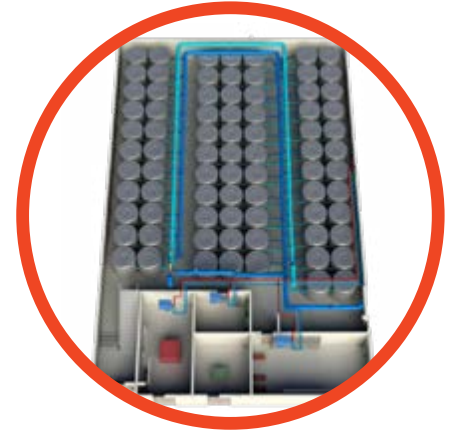
The chillers generate 1.1 million pounds of ice each night when loads are low, taking advantage of lower-cost off-peak electricity rates. The ice is stored in seventy-nine CALMAC® IceBank® thermal energy storage tanks, and used for daytime cooling. The system enables Nebraska Furniture Mart to stay off the grid during peak demand hours, helping to prevent area brown outs and reducing the store's energy costs.

Managing operations and energy use

The retailer uses a Trane® Tracer™ SC to streamline facility management with a flexible, cost effective solution for building automation and comfort management. Accessible from most PCs, tablets, and smart phones, the online tool helps provide improved efficiencies to reduce operational costs. The Tracer SC collects data from points throughout the facility to enable Trane Intelligent Services to monitor energy use, helping the retailer manage the facility for efficiency, reliability and comfort. Using data provided the facility managers, Trane generates energy reports to assist in evaluating additional energy saving opportunities.

Results

An EarthWise™ Ice-Enhanced Chiller Plant is helping provide a comfortable, low humidity environment for Nebraska Furniture Mart customers, as well as energy savings and demand avoidance. Shifting energy usage to lower-cost nighttime hours has lowered facility utility rates and eliminated 1.6 megawatts of electricity from the afternoon grid, helping avoid area brown outs. "At first, using thermal storage seemed counterintuitive," said Kincheloe. "First costs were more and it used more energy. But we soon realized that with less daytime demand, we could get better utility rates. Selecting thermal storage wasn't an easy decision, but it was the right decision for us."



About Nebraska Furniture Mart

Using seventy-nine thermal storage tanks, the Nebraska Furniture Mart chiller plant can cool the equivalent of 632 normal-size houses.



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