



CASE STUDY

Fernbank Museum of Natural History

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Preserving culture and collections

Fernbank Museum of Natural History in Atlanta, Georgia, is a beloved educational, cultural, and living institution that preserves priceless artifacts and fosters lifelong learning. With more than 160,000 square feet of exhibit space, the museum welcomes about 500,000 visitors every year, including school field trips and other public programs. The quality of the indoor environment – from precise temperature and humidity requirements to comfort, cleanliness, and safety – is essential to helping Fernbank deliver on its mission.

Since 1992, Fernbank has trusted Siemens as a long-term partner to help maintain and modernize its facilities with a holistic approach that combines energy efficiency, environmental and building controls, and digital technologies for more resilient and sustainable museum operations.

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Evolving needs drive modernization

Fernbank's mission is rooted in its origins. "Fernbank was founded in 1939 to preserve Fernbank Forest and to teach about nature," says President and CEO Jennifer Grant Warner. "That legacy informs everything we do today. Our museum opened on this campus in 1992, and now it spans a 120-acre site with the museum itself, Fernbank Forest, WildWoods, and a giant screen theater. We're here to spark curiosity and ignite a passion for science, nature, and culture, and we do that by offering hands-on experiences."

According to Warner, providing that experience takes more than engaging exhibits.

"This museum must support everything from public programs to rigorous conservation standards. That includes our permanent collections, rotating exhibits, and objects on loan. Serving the community means doing so in the most sustainable and financially responsible ways possible."

Facilities leadership at Fernbank began to identify problem areas within the campus building systems and equipment about five years ago; that is, as Fernbank's systems aged, the risk of noncompliance increased. Repair costs increased, energy performance declined, and staff had to devote more time and effort to simply keeping things running.

"We were starting to lose the ability to control air quality in some spaces," explains Dana Harvey, Vice President and Chief Technology Officer. "When you're talking about stringent requirements for collections care and special exhibits, that's a big deal, especially to those who lend us exhibits and artifacts, because it can jeopardize the condition of what's under our care. That's what drove the start of this modernization effort."



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Why system reliability matters to Fernbank and its mission

When it comes to system reliability, the stakes are especially high for a museum like Fernbank. "We run several temporary exhibitions a year, typically on a three-to-four-month cycle. Before a lender agrees to send us their collection, we must meet strict environmental requirements, which are laid out in contractual agreements. That includes documented temperature and humidity history from our sensors," Harvey says.

Any deviation from those conditions is not only recorded but also reported back to the lender. Harvey goes on to say, "If we have problems in those spaces, they'll know. And when you can't meet those expectations, it jeopardizes future loans – not just from that institution, but potentially others too."

Warner underscores that responsibility, adding, "We are also stewards of our own permanent collections. These are real artifacts that tell stories and foster lifelong learning. As an accredited museum – something fewer than 4% of U.S. museums achieve – we uphold a rigorous set of standards related to ethics, care, and operations. The reliability of our building systems demonstrates our commitment to those responsibilities."

Smart solutions for resilient operations

Many of Fernbank's mechanical systems had reached the end of their useful life, creating serious risks to artifact preservation and overall museum operations. Failure of these aging systems could have jeopardized the tightly controlled environmental conditions, especially in key areas such as the temporary gallery and fossil collections storage, where precisely maintained temperature and humidity levels protect priceless items.

Siemens worked alongside museum leadership and facility staff to design a phased, multi-year modernization program that aligned with the museum’s mission and the practical realities of operating a high-use facility with exacting standards. This approach incorporated the replacement of aging infrastructure and introduced advanced automation and digital solutions to create consistent performance, energy efficiency, redundancies, and long-term resilience.

Central plant improvements	Airside improvements
• High-efficiency chillers selected for superior part-load capability and redundancy • Variable frequency drives (VFDs) on pumps to enable variable primary flow strategy • SweepClear filtration to keep condenser water system clean • Upgraded refrigerant monitoring and mechanical room exhaust systems for safety • Ongoing mechanical services for chillers, cooling towers, and AHUs	• Replacement of aging air handling units (AHUs) with fan wall systems, adding redundancy and improving efficiency • Dynamic VAV Optimization (DVO) to balance comfort and energy savings • UV disinfection lighting to keep coils clean, which enhances life of coils and allows for reduced pressure drop • Electronic actuators to replace pneumatic controls
Ongoing digitalization	Fire + life safety upgrades
• Smart Building Assessments to identify opportunities and monitor performance • Building X Operations Manager to remotely operate and monitor building equipment and applications in real time, boost productivity, reduce travel costs, and minimize downtime	• Desigo Fire Safety Compact system for flexible, scalable fire protection that adapts to new conditions • Building X Fire Manager for remote, secure access and monitoring of the fire system

Central plant improvements also enable backup capacity to tap into the new, high-efficiency chillers should they be needed to maintain operations. Director of Facilities Jimmie Mosely says, "From a facilities perspective, there’s value in redundancy, even with brand new equipment. Siemens worked with us to create a robust system that allows for the level of redundancy we need. For example, when you need to complete scheduled maintenance, you can reduce output while still meeting environmental requirements."





Seamless implementation without disruption

Upgrading a museum that closes only two days a year requires a level of partnership and planning that goes beyond technical expertise. “Siemens has been a partner to Fernbank for over 30 years,” Harvey notes. “That kind of long-term relationship matters. If you switch providers, you lose knowledge and efficiencies. And with systems as important as our HVAC, building automation, and fire and life safety systems, you need a partner who understands how those systems work and how this building operates.”

One of the most challenging elements was replacing large air handling units without affecting temperature or humidity conditions in critical exhibit areas. Siemens used creative solutions, including demising walls and phased retrofits, to ensure seamless transitions with no impact to environmental conditions or the visitor experience.

This approach proved essential for keeping the building functional while upholding Fernbank’s commitment to the community and to the preservation of its collections. According to Harvey, Siemens knowledge of the building and Fernbank’s operational constraints made a real difference: “They understood our stringent requirements, and they saw this project the same way we did, and that’s valuable.

Measurable benefits for Fernbank Museum of Natural History

Upgrades to Fernbank's building systems are already yielding measurable gains, and further improvements are anticipated as additional components come online.

"In the temporary gallery, we've seen a night-and-day difference in how we control the space," says Mosely. "The new dampers, reheat zones, and air handling units have enabled much more precise control. As the system continues to adapt and graphics are dialed in, we're fine-tuning based on the data we see. It's working like we hoped, and we're optimistic about applying the same approach in other areas."

Mosely goes on to say that, with additional renovations and expansion projects planned, the modernization project with Siemens is a strategic move that improves the museum's data output and optimization, so they can best take advantage of both their building automation system and Building X.

That level of visibility and control brings environmental stability, while also enabling the museum to reallocate resources more effectively. Says Harvey: "This was a major financial undertaking for us, and we all understand the return on investment. The long-term savings on energy, water, and ongoing repairs will allow us to reinvest in programming that directly supports the museum's mission."

All told, the combination of infrastructure renewal projects at Fernbank has generated annual energy savings in excess of \$150,000 as well as utility rebates of approximately \$147,000. More than the fiscal benefits, Warner is grateful for the additional peace of mind that the project with Siemens has warranted. "Our exhibits and collections teams now have both the confidence and the data to know that we can meet regulatory requirements and maintain the right conditions for responsible stewardship."

Savings + Rebates = Big Returns



\$150,000+
energy
savings



\$147,000
utility
rebates

Protecting collections for the future of Fernbank

Siemens continues to provide Fernbank with service and support to help ensure system performance over time. “One other piece that jumps out is that we are now reliably producing good air quality for the museum. We’ve implemented several technologies there, and with many exciting things to come, the foundation we’ve laid will support what we’re doing over the next year to fifteen years,” notes Harvey.

With ongoing energy, automation, and mechanical services, as well as next-generation platforms like Building X, Fernbank is well-positioned to protect its collections, enhance visitor comfort, and operate sustainably for years to come.



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