Succeeding in Sustainability

ASHRAE Headquarters Renewal Ceremony

October 23, 2008

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

Order of Events

Welcoming Remarks..William A. Harrison, ASHRAE President

Recognition of Donors..William A. Harrison

Recognition of Staff and Volunteers..........Jeff Littleton, ASHRAE Executive Vice President

ASHRAE Headquarters: A Message from the President

Sustainable buildings ultimately mean preserving resources for future generations. The design of energy-efficient buildings with sustainable materials now lets us reap benefits for many years to come.

As innovators in energy-efficient technology, ASHRAE felt our Headquarters should serve as a showcase of sustainability. The resulting design truly reflects that sentiment as well as how ASHRAE standards and guidelines put into practice result in a high-performing building.

ASHRAE had four main goals for the renewal: to provide a healthy and productive workplace and meeting space for employees and members; to demonstrate a commitment to sustainability; to build a learning center to increase resources for on-site educational opportunities and meetings; and to create a "living lab." As part of the living lab concept, the building will be heavily monitored and metered to capture building performance data, much of which will be accessible to members online at ASHRAE.org.

Of course, none of this would have been possible without the hard work and commitment from many volunteers and staff involved in the renewal for the last three years. More importantly, generous donations by companies and firms have ensured that not only our building will be here for a long time to come, but that ASHRAE can continue to provide the sustainable building technology guidance that we are known for.

Our members, staff and donors should be proud of their commitment to supporting green building practices and the technology behind them. Because of their contributions, ASHRAE Headquarters will truly be a sustainable showcase for the building industry as well as a resource for many years to come.

Thank you.

Wm. A. Harrison

William A. Harrison

Building ASHRAE's Sustainable Showcase

ASHRAE's goal in renovating its existing Headquarters was to provide a healthy and productive environment for staff and to showcase ASHRAE technology, while demonstrating the Society's commitment to sustainability. The building was designed as a "Living Lab" and demonstration model for our membership in advancing the arts and sciences of HVAC&R while serving the needs of current ASHRAE staff, taking growth into account.

In 2005, the ASHRAE Board of Directors voted to adopt sustainability as the central theme for the Strategic Plan. Demonstrating that commitment to sustainability, the Board decided to renovate and expand the existing headquarters building. At the same time, a target was set for achieving LEED-EB Gold and LEED-NC 2.2 designation for the renovated building.

The Ad Hoc Committee assembled a great professional and volunteer support team. On the professional side, a team was assembled including RWH as the architects on the project, Johnson & Spellman Associates as the mechanical and electrical engineers, Gay Construction as the construction managers and CxGBS as the Commissioning agents. A Technical Advisory Committee was established with subject matter experts from our vast volunteer base in areas such as architecture, mechanical systems, lighting, controls, sustainability, IAQ, energy, and operation and maintenance.

Goals included maximizing day lighting by minimizing perimeter offices and use of modular furniture; following the guidelines in the Advanced Energy Design Guide for Small Office Buildings; providing 30 percent higher ventilation than required by ASHRAE Standard 62.1-2004, Ventilation and Indoor Air Quality; reducing energy use by 30 percent as compared to ASHRAE Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential; provide renewable energy through solar photovoltaic to meet 10 percent of the annual peak electrical demand of the building; and providing building performance and system data that will interface through ASHRAE.org.

Some of the key technical parameters of the final project include:

- A fully dedicated roof mounted DOAS system proving 6,000 cfm of outside air and incorporating dual sage air to air heat recovery desiccant heat wheels, variable-speed outside air and exhaust air fans, dx cooling coils and MERV 13 air filters
- Level 1 of the building and the Learning Center are conditioned using variable refrigerant flow inverter driven, two-stage outdoor dx heat pumps and ducted fan coil units operating on HFC 410A
- Level 2 of the building is conditioned using two-stage, 27 EER variable-speed ground source heat pumps operating with a geothermal field comprising 10-400 feet deep wells and a closed loop piping system
- High-efficiency lighting operates at 25% to 35% lower power level with occupancy sensor control
- A roof-mounted 20 KW photo-voltaic electrical power generating array
- A water-efficient plumbing system includes high-efficiency low-flow toilets, waterless urinals, and solar water preheat of domestic hot water
- Storm water retention capacity provides harvested storm water for irrigation
- A direct digital control system provides overall control, with web browser interface has wiring and sensors and manipulation capability, web access, and a meteorological monitoring station to monitor the building. The system provides sufficient

Building ASHRAE's Sustainable Showcase

data that are useful for a broad range of HVAC&R research and development on buildings, the building environment, building systems, subsystems, equipment, and controls. The facility will display the performance of the building, including air temperature, humidity, CO2 concentration, air pollutants concentration, air-flow rates, ambient noise level, and lighting levels, while showcasing mechanical features of building and monitoring the environmental quality.

ASHRAE Headquarters History

The building that serves as the ASHRAE headquarters in Atlanta, Ga., was built in 1965 and dedicated to Employers Mutual of Wausau, an insurance company, on Feb. 23, 1966. The building was known as the Wausau Building until 1981, when ASHRAE purchased the building and moved its headquarters from New York City to Atlanta.

The headquarters building was extensively renovated in 1981 and dedicated to ASHRAE on Oct. 6, 1981. Another major renovation of the interior took place in 1991-1992. Smaller changes in the 1990s included reconfiguration of interior space on both floors for additional office space.

ASHRAE Headquarters Renovation Ad Hoc Committee

William A. Harrison, Chair
Darryl K. Boyce, P.Eng.
Presidential Member Damon Gowan
Gordon V. R. Holness, P.E., Fellow ASHRAE, Life Member
Ronald E. Jarnagin
Jeff Littleton
Michael Vaughn

Building Team

Architects – Richard Wittschiebe Hand
General Contractor – Gay Construction
Mechanical Engineer – Johnson, Spellman and Associates
Mechanical Contractor – Batchelor and Kimball
Electrical Engineer – Jeffers Engineering Associates
Electrical Contractor – Gene Lynn Electric
Commissioning Agent – CxGBS

ASHRAE Renewal Donor Partners

ASHRAE Foundation

The ASHRAE Foundation Learning Center, supported in part by a donation from Presidential Member Damon Gowan and his wife, Carolyn, reflects ASHRAE's commitment to education, housing leadership forums, educational seminars, member meetings, etc. The center includes an addition to the existing Headquarters building that has conference seating capacity.

Automated Logic Corp.

Automated Logic Corp.'s Web CTRL® networked building automation system hardware and software components provides integrated control of HVAC equipment from multiple manufacturers, maintaining a comfortable, healthful and energy-efficient working environment. It provides a user interface for ASHRAE's living lab, allowing researchers around the world to monitor performance and extract data for research purposes.

Carrier

Carrier is supporting naming of the ASHRAE library on the second floor in memory of Willis H. Carrier as the Willis H. Carrier Engineering Library.

ClimateMaster

12 ClimateMaster Tranquility 27™ series two-stage R410a high-efficiency horizontal water-to-air heat pumps with variable speed fans (27 EER part-load, 18 EER full-load)
Two ClimateMaster Tranquility™ series R410a high-efficiency console water-to-air heat pumps (15 EER)
4,800 ft. of vertical closed-loop geothermal heat exchanger consisting of 12 bores at 400 ft. depth each fitted with 1.25″ high-density polyethylene heat exchanger piping and thermally-enhanced grout. High-density polyethylene supply and return lines trenched to building and stubbed into mechanical closet.

The geothermal heat pump system utilizes on-site renewable energy to provide high-efficiency heating and cooling for the 14 individual zones that compose the second floor of ASHRAE Headquarters.

Daikin

VRV^®III Variable Refrigerant Volume Heat Recovery System; VRV^®-S Variable Refrigerant Volume Heat Pump System; SkyAir Heat Pump Systems; A mixture of Daikin ducted and duct-free fan coils; Intelligent Touch Controller and Web-enable software; Intelligent Manager management system, power proportional distribution and Web-enabled software
BACnet^®gateway interface; Air Net 24-hour online monitoring system

The Daikin systems serving the first floor and the Learning Center provide a solution to increase the usable space without costly building modifications. The non-ozone-depleting potential refrigerant, individual zone control capabilities and heat recovery technology help ASHRAE to reach its goals of building an energy efficient and sustainable Headquarters.

In addition, Daikin is supporting naming of the reception area as the Daikin Reception Area.

Georgia Power/Southern Company

General Electric 170 Watt Photovoltaic Modules
85-gallon Rheem-Ruud Eclipse electric water heater

The solar panels and electric water heater provide ASHRAE Headquarters with some of the innovative technologies and contemporary equipment needed to serve as a living laboratory that gathers data on sustainability, energy conservation and indoor air quality for the state of Georgia. The modules make up a solar electricity system that produces electricity during daylight hours and back feeds energy into an existing grid. The panels are named in honor of Nance Lovvorn, ASHRAE Fellow.

Trane

Trane CDQ® wheel, multi-stage Trane DX R-410 compressors; NovelAire® 80% recovery wheel; Dynamic™ V8 electronic filters, TCF direct drive plenum fans; Trane VFD's, ADSIL® protected coils; Trane MP-581 unit controls

Trane donated key elements of the building's HVAC system to deliver performance, reliability, indoor air quality and energy efficiency. The system provides ventilation air, humidity and building pressure control to create an ideal work environment for employees. The Trane dedicated outside air unit is enhanced with Trane CDQ™ dehumidification, energy recovery wheel and direct drive plenum fans. Additionally, Trane unit controls optimize performance by reconfiguring internal components with bypass dampers.

In addition, Trane is supporting the naming of a conference room as the Reuben Trane Executive Conference Room.

Aircuity

Aircuity's OptiNet® Multiplexed Sensing System

Throughout the Headquarters, OptiNet senses a broad array of indoor environmental parameters (carbon dioxide, dewpoint, VOCs, small airborne particulates, carbon monoxide and temperature) and integrates this information with the onsite building management system for the control of the indoor environment. All of the data is accessible through a protected Website and a BACnet interface allowing the information to be easily viewed, downloaded and graphically analyzed.

Interface FLOR

Interface FLOR Modular Carpet provides soft-surfaced floorcovering in most spaces of Headquarters.

Allsteel®/Ivan Allen

Allsteel storage solutions help meet ASHRAE's storage needs, which go beyond the usual call for storage. Allsteel is covering the Society's most critical storage needs with stylish solutions that are full of convenience, capacity and durability.

Mark Brandli, design principal/Richard Wittschiebe Hand
Some 900 square feet of Cherokee White marble slabs donated by Brandli is being used on the wet wall locations in the restrooms at Headquarters. Quarried around 1965, the panels were reclaimed from a 2004 Atlanta office building renovation. Since landfill costs prohibited disposal, some 5,000 square feet of marble was salvaged and reused in numerous Atlanta area projects from 2004 to 2008.

Commissioning & Green Building Solutions (CxGBS) Inc.
Holistic Commissioning™
Using this integrated process results in a fully functional, fine-tuned facility with complete documentation of its systems and assemblies and trained operating and maintenance personnel. The commissioning process can reduce the cost of construction as well as the life-cycle cost of the building and increase the comfort and productivity of the occupants.

Dynamic Air Quality Solutions
Dynamic V-8 High Efficiency Air Cleaning System ensures optimum air quality throughout the Headquarters.

EBTRON Inc.
EBTRON® model GTA-Pc Advantage Velocity/Temperature Meters with dual analog outputs and EBTRON® model SCN202-T/VAV native-BACnet® VAV Controller with EBTRON® Velocity/Temperature Sensors and RS-485 interface EBTRON® velocity and temperature sensors control airflow for space pressurization at differential pressures much lower than possible with static pressure sensors or with other control devices. They may also be used to verify airflow to +/- 2 percent or reading and temperatures to within 0.15°F (0.1°C) in specific ducts or fan-coil units. The EBTRON® application-specific VAV terminal controller are being used with their integral EBTRON® velocity/temperature sensors as BACnet® outputs to verify zone supply flows and temperatures for data acquisition during testing with NIST-traceable precision.

Bill and Margaret Harrison
Two conference rooms, funded by ASHRAE President Bill Harrison and his wife, Margaret, were named in honor of two long-time ASHRAE staff members – Gloria Cofer, executive assistant to the Board of Directors who began work at ASHRAE in 1981, and Carolyn Kettering, director of membership who began work at ASHRAE in 1985.

Bruce Hunn
A contribution from Bruce Hunn, ASHRAE's director of strategic technical programs, is being used to complete an outdoor second-level cafeteria area and walkway. Prior to a promotion earlier this year, Hunn had served as ASHRAE's director of technology since 1997. He has been an ASHRAE member since 1977 and a Fellow since 1994.

Northwrite
NorthWrite Energy Expert – Software and Wireless Monitor monitors before and after energy usage by ASHRAE Headquarters. The Web-based software tool, designed for tracking energy use and calculating energy savings associated with retrofits and operations and maintenance changes to a building, accounts for weather and schedule variation and calculates carbon footprint and emissions reduction.

PolyCon

ASHRAE's asphalt pavement will be overlaid with the solar reflective version of PolyCon Manufacturing's E-KRETE/ Slurry Coat - SR, which will alter the pavement surface. It becomes a "green" pavement, cool, illuminated and environmentally friendly.

Thermal Gas Systems Inc.

Haloguard®IR Photoacoustic Infrared technology from Thermal Gas Systems provides the Headquarters mechanical room with the highest level of protection from refrigerant loss to reduce maintenance costs, ensure maximum chiller performance and provide worker and environmental safety.

U.S. Green Building Council

USGBC waived the Leadership for Energy and Environmental Design (LEED®) for New Construction registration and certification fees. The renovation is a LEED-NC (2.2) project under the LEED Green Building Rating System, which provides independent, third-party verification that a building project meets the highest green building and performance measures.

VFA Inc.

VFA's facility condition assessment services will be used to determine necessary facility improvements and for developing long- and short-term capital plans for ASHRAE Headquarters.

Other donors include GE Power and ITT/Bell & Gossett/ James M. Pleasants Co

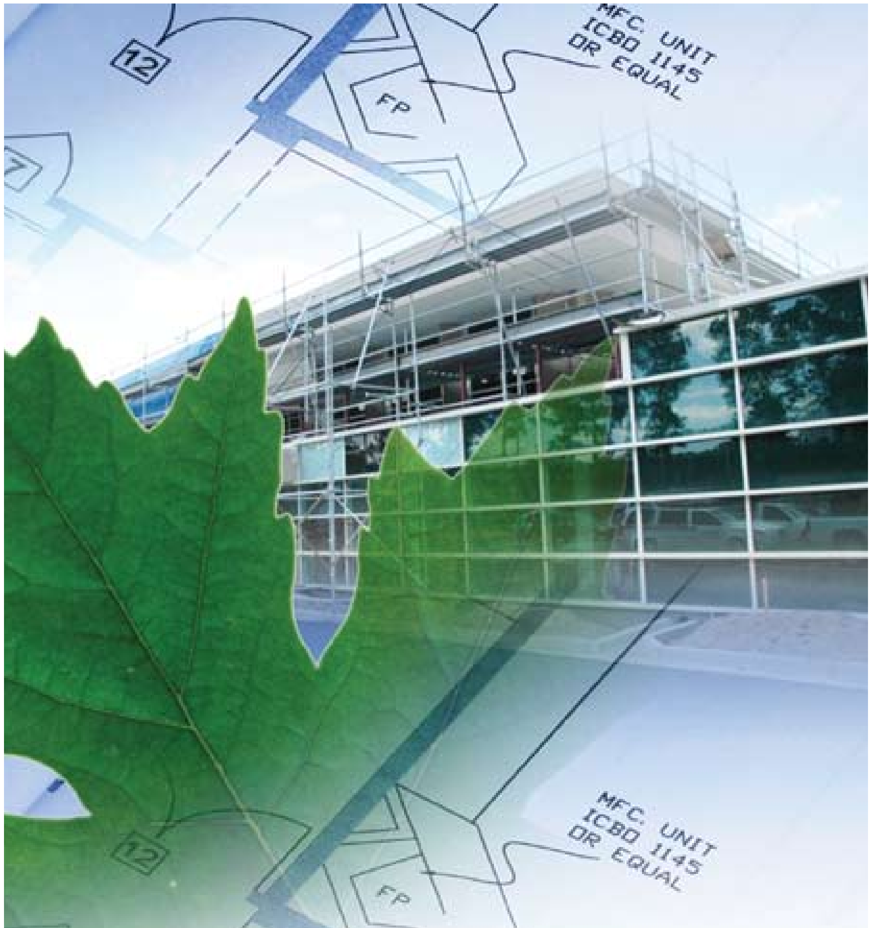
Individual Headquarters Renewal Campaign Donors

Paving Stones

J.R. Anderson
Lin Bacon
Tom Barrow
Erich Binder
Andrew Boggs
J. Raymond Carroll
James Fields
Charles Henck
Jeff Littleton
George Misleh
Kent Peterson
Eric Schwenker

Bookcases

James Richter
Tom Barrow (2)



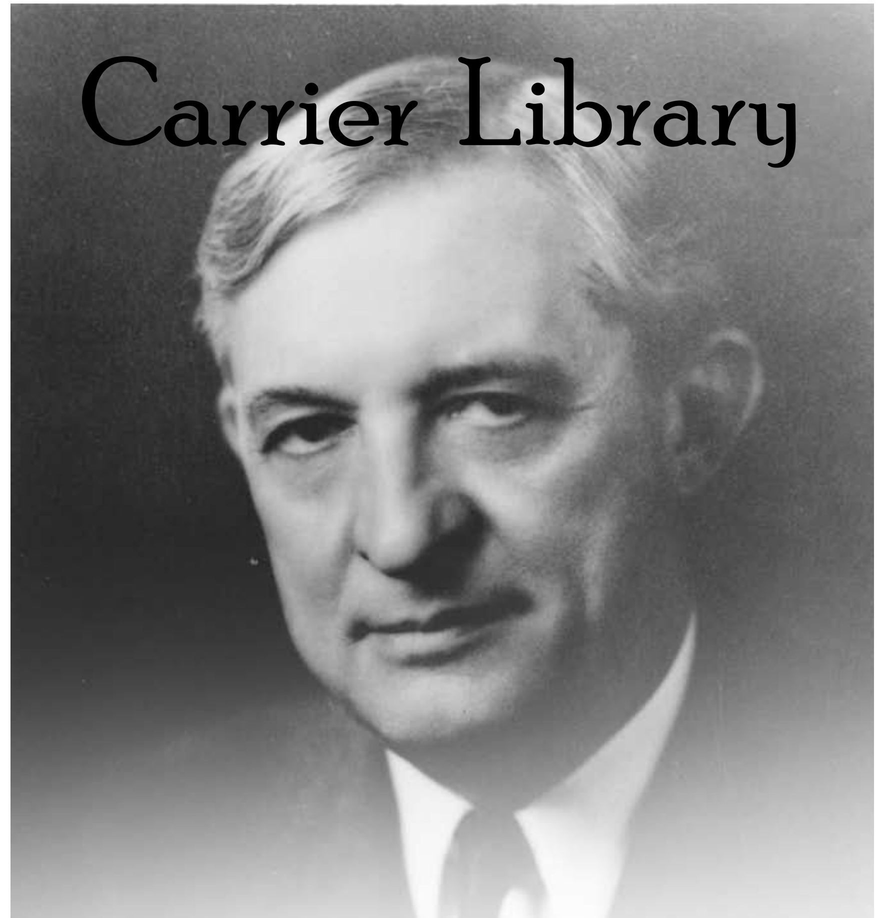
Georgia Power congratulates

ASHRAE

for setting the standard by its commitment to energy efficiency and sustainability.

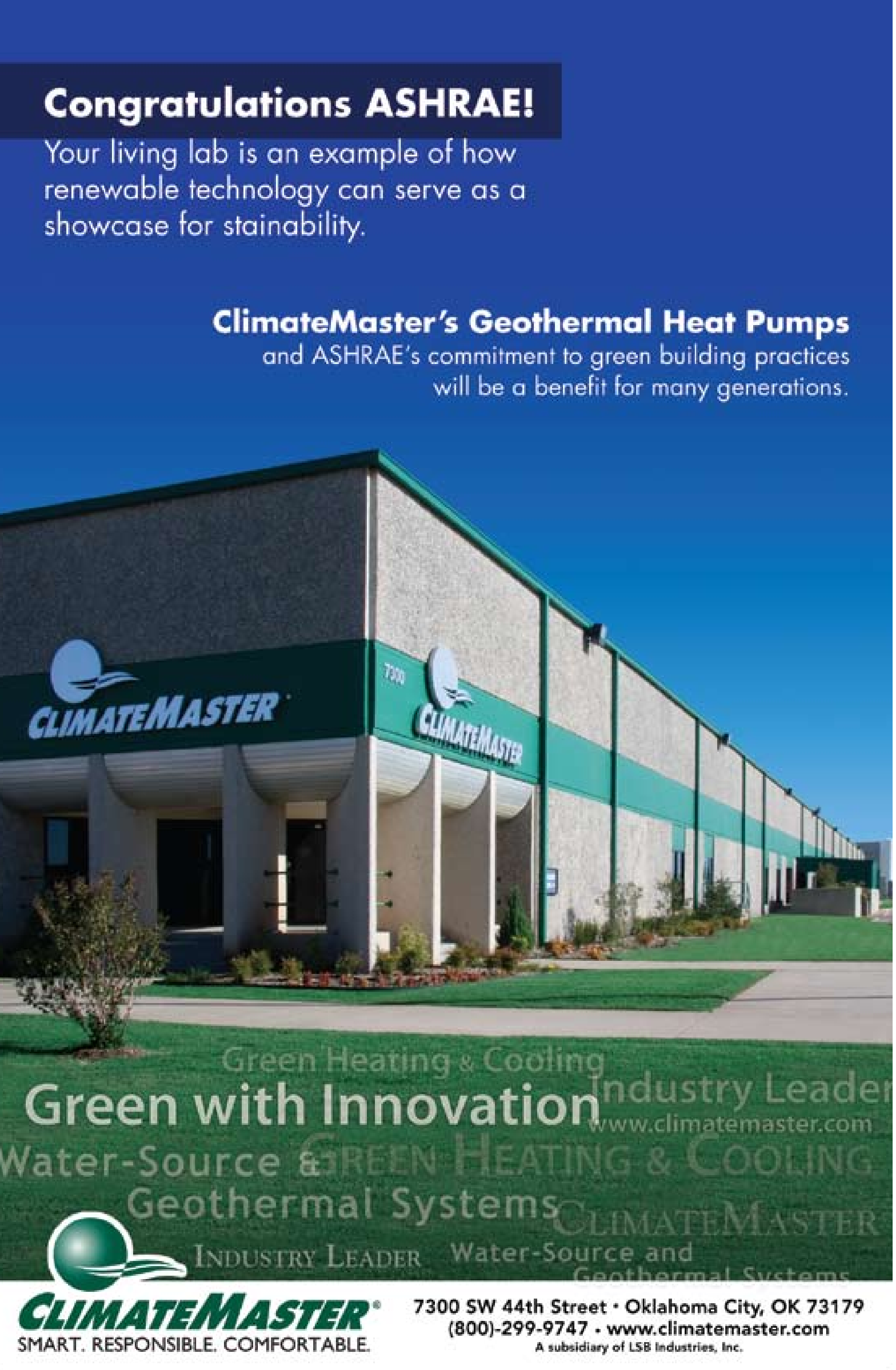
GEORGIA POWER
A SOUTHERN COMPANY

Carrier Library



It is with great honor that the ASHRAE Engineering Library will be named after Willis H. Carrier. Carrier invented the first system for "manufactured weather" in 1902 and sparked an industry that revolutionized the way in which we live, work and play. From that defining moment—and through to the present day—Carrier has built on a legacy of innovation. For more than a century, Carrier's research, expertise and forethought have resulted in market-leading innovations and "firsts" that have shaped and defined the heating, air conditioning and refrigeration industry. With a history of product excellence and committed customer service, Carrier has evolved into a global company serving millions of people and businesses in over 170 countries on six continents around the world.

Carrier
A United Technologies Company


Congratulations ASHRAE!
Your living lab is an example of how renewable technology can serve as a showcase for stainability.
ClimateMaster's Geothermal Heat Pumps
and ASHRAE's commitment to green building practices will be a benefit for many generations.
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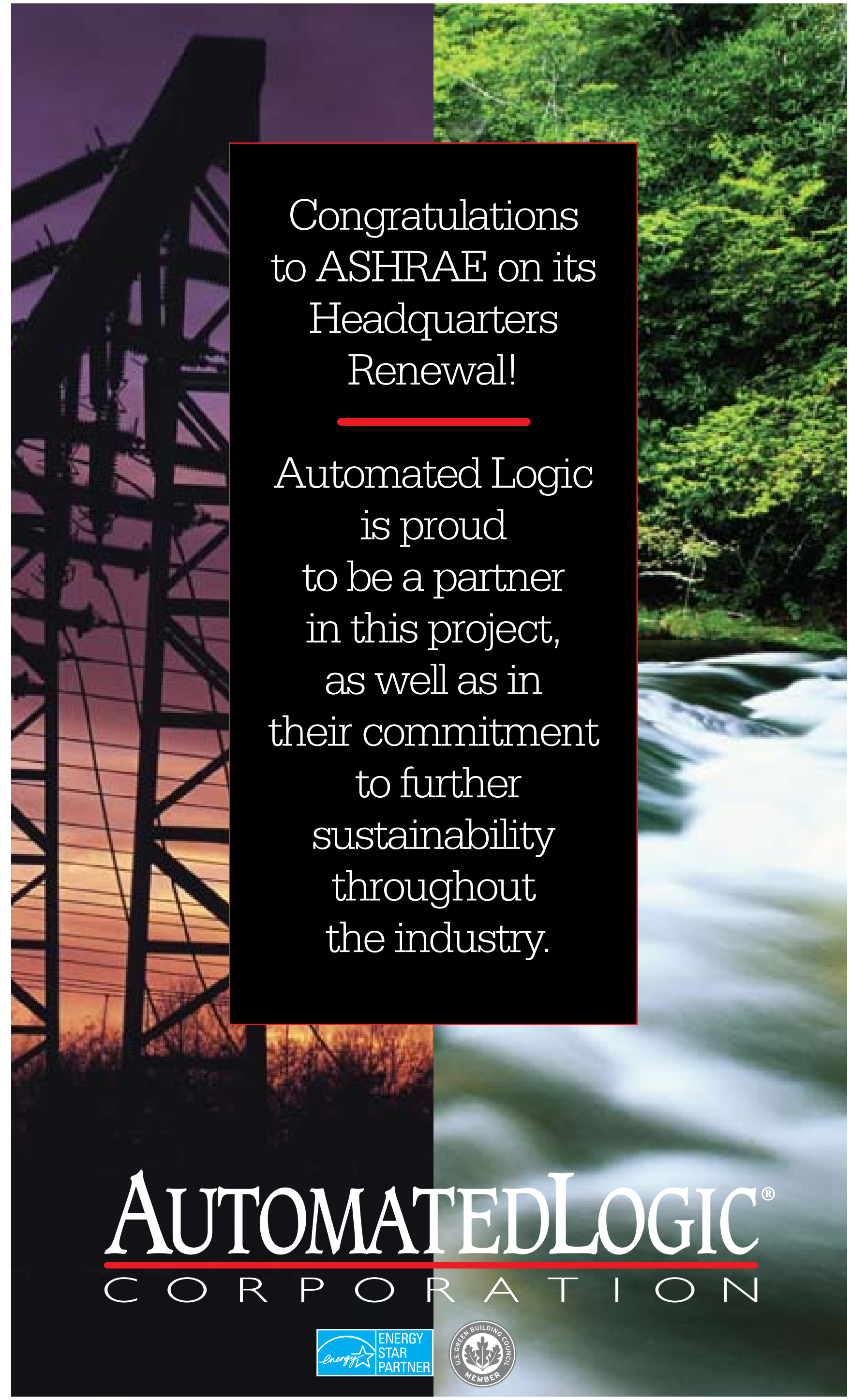
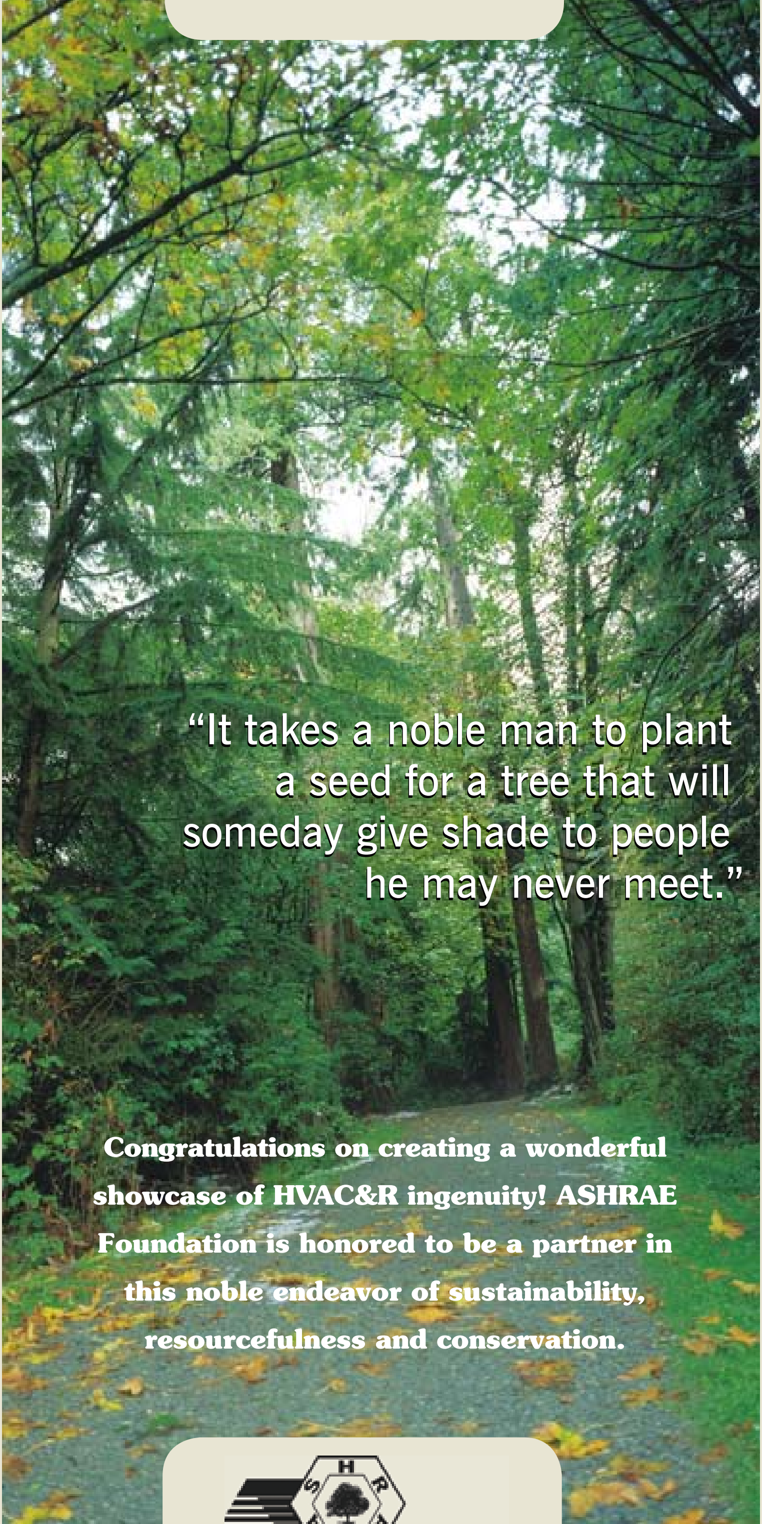

Congratulations to ASHRAE on its Headquarters Renewal!
Automated Logic is proud to be a partner in this project, as well as in their commitment to further sustainability throughout the industry.
AUTOMATEDLOGIC®
CORPORATION
ENERGY STAR PARTNER
U.S. GREEN BUILDING COUNCIL MEMBER



ASHRAE FOUNDATION