ASHRAE HEADQUARTERS

MISSION POSSIBLE: Designing a Living Lab

Once built, the new ASHRAE headquarters will function as a “living lab” to help advance the arts and sciences of HVAC&R. Some ideas for the types of information available:

- Provide energy, demand and environmental data from HQ building through web interface.
- Be visible, when and where appropriate, within the space as an educational feature.
- Provide additional sensors and monitoring capability in spaces such as conference rooms, so the data could support experimental work for ASHRAE research.

ASHRAE HEADQUARTERS

ASHRAE’s New Global HQ

Mission Possible

BY MARY KATE MCGOWAN, ASSOCIATE EDITOR, NEWS AND SARAH FOSTER, MANAGING EDITOR

ASHRAE aims to exceed the provisions set forth in its standards, guidelines and publications for the renovation of its new global headquarters building in Metro Atlanta.

The renovated facility will incorporate high-quality, energy-efficient and environmentally sustainable HVAC&R equipment that reflects an understanding of the high-performance building movement, and achieves superior efficiency while providing a healthy and comfortable environment.

ASHRAE is relying on its wealth of technical information as the foremost source of technical and educational information for the HVAC&R industry to renovate a 41-year-old facility into a net-zero-energy-ready destination. The new headquarters is being designed to be resilient and exceed the provisions of the Society’s energy and indoor air quality standards.

ASHRAE’s current headquarters building will become part of Children’s Healthcare of Atlanta’s expanded state-of-the-art medical campus. The Society’s global headquarters will relocate in October 2020.

The new location, 180 Technology Parkway in the northeast Atlanta suburb of Peachtree Corners is a 66,700 ft² building constructed in 1978 on 11 acres. The two-story building, including a partial basement, will be designed to provide space for about 125 occupants.

The new headquarters will fulfill ASHRAE’s mission to advance the arts and sciences of HVAC&R by showcasing the latest HVAC&R equipment and technology and being a living lab (see below). As with its current headquarters, ASHRAE intends to attract industry visitors to experience the state-of-the-art technology.
ASHRAE’s new headquarters aims to eventually be zero energy as defined by the Department of Energy, as well as achieve an ASHRAE Building EQ score of 0.

Using ASHRAE’s Expertise

ASHRAE is relying on its own technical information to create this net-zero-energy-ready office.

The maximum demand side site EUI for the building ideally would be 21.4 kBtu/ft²·yr, consistent with the energy targets in the Advanced Energy Design Guide for Zero Energy Office Buildings, according to the owner’s project requirements (OPR). ASHRAE, in collaboration with industry partners, develops the AEDG series. The AEDG for zero energy offices is directing the facility’s lighting, including façade lighting in private and open offices, and daylighting.

ASHRAE’s standards and technical information expertise touches the breadth and depth of the built industry. This will be reflected in all parts of the renovated facility.

From controls in the new headquarters being native BACnet to the server room best practices coming from ASHRAE Thermal Guidelines for Data Processing Environment, ASHRAE’s mission is informing the project’s design and operation. Using Equipping a building to be a living lab includes provisions for a building automation system, additional wiring and sensors in certain spaces, electronic data storage and manipulation capability, web access and a meteorological monitoring station. The data could be used for a range of HVAC&R research.

The OPR says the facility will be designed to accommodate a dedicated research space suitable for a wide range of investigations of interest to ASHRAE technical committees and other organizations working on ASHRAE research.
The new, renovated facility will become a showcase for cost-effective building integrated solutions and technology, providing a destination venue for industry visitors to experience state-of-the-art technology installed and ‘in action’ in a built environment.

a BACnet-native building automation system will provide a turnkey solution to machine-to-machine communications that is capable of remote access/alarm notification, according to the OPR. ANSI/ASHRAE/IES Standard 90.1-2016, Energy Standard for Buildings Except Low-Rise Residential Buildings; ANSI/ASHRAE Standard 55-2017, Thermal Environmental Conditions For Human Occupancy; and ANSI/ASHRAE Standard 62.1-2016, Ventilation for Acceptable Indoor Air Quality, are a few of the high profile standards the design team is planning to meet or exceed.

The renovated facility is being designed to deliver outdoor air at a value of at least 1.3 times the minimum requirement of Standard 62.1-2016. Regarding Standard 90.1, the lighting in both private and open offices within the new headquarters is being designed to reduce lighting power density by 25% or 35%, respectively, below Standard 90.1-2016 requirements.

The building envelope will be tightened to exceed minimum requirements allowed by Standard 90.1-2016, and the fenestration and solar transmission will be controlled and designed through glazing selection and external shading, in accordance with Standard 90.1-2016. The new headquarters mechanical systems will be designed with the required serviceable life, as specified in the “Energy Use and Management” and “Building Energy Monitoring” chapters in the most recent ASHRAE Handbook—HVAC Applications.

The building’s commissioning will be performed and completed in accordance with ASHRAE Guideline 0-2013, The Commissioning Process, and ASHRAE Guideline 1.1-2007, HVAC&R Technical Requirements for the Commissioning Process.

The use of ASHRAE technical information will not stop there. Instead, the new headquarters building will support further research and development. According to the OPR, ASHRAE Technical Committee 7.3, Operation and Maintenance Management, will be encouraged to participate in establishing operation and maintenance guidelines that will form the requirements and provide best management practices for establishing preventative maintenance strategies.

Planning for Health and Wellness

Occupants are vital considerations in the building process. The new headquarters’ design should create a work environment that enhances its occupants’ health, fitness and wellbeing. The building design is expected to address these strategies with most strategies to improve employee health and wellness achieved through staff policies and programs. ASHRAE is planning a staff shower, change and locker facilities to encourage bicycle commuting or noon time staff and visitor fitness activities.

The indoor environment should also support occupant health and wellness. Design features will support superior indoor environmental qualities such as acoustics, and renewable systems. As part of the design process, the design team will facilitate a resiliency workshop with the ASHRAE HQ Technical Advisory Subcommittee and the Ad Hoc building committee to establish the building’s resiliency goals and its operations.

The design team and ASHRAE will consider the feasibility of resiliency design strategies such as creating a safe room. The design team is mandated to research

MISSION POSSIBLE Planning for Resiliency

ASHRAE’s new headquarters will showcase the latest HVAC&R technology—without interruption.

A resilient building is both resistant to disruptions from weather, utility outages and other events and has the ability to recover quickly and return to full operation after such disruptions, according to the OPR. The facility’s resiliency features will be considered for integration into the building envelope, HVAC systems, and storage systems. The design team will ensure that the building is capable of withstanding severe weather events and utility outages, and can quickly recover from such disruptions.

The design team and ASHRAE will consider the feasibility of resiliency design strategies such as creating a safe room. The design team is mandated to research
Community

The new home of ASHRAE’s headquarters is one of a few Atlanta metro cities recognized for its dedication to sustainability.

Peachtree Corners is a green community, according to an Atlanta Regional Commission certification program, based on the city’s efforts to reduce the city’s environmental impact through city ordinances, green purchasing programs and more. One of the city’s sustainability priorities is redeveloping Technology Park—the site of ASHRAE’s headquarters.

Mayor Mike Mason told the Gwinnett Daily Post Peachtree Corners is pleased a company of ASHRAE’s distinction has chosen the city. “Technology Park is a natural fit for a business whose work mirrors the city’s efforts in sustainability and green living,” he told the paper.

Within Technology Park, the city is creating a multi-use trail system. ASHRAE has consented to having the trail wind through its property, allowing staff and visitors to connect with the outdoors.

Peachtree Corners also offers expedited development and building plan review and site inspections for projects that use solar energy.

The project is a blueprint of an economically justifiable retrofit with replicable technology.

and determine how a warming climate will affect severe storms, flooding, wildfires and more, according to the OPR. If the design team’s research determines these impacts are significant, the building should be designed to address these issues. One strategy is to use durable building materials such as windows capable of withstanding storm event winds and interior finish materials that can dry out if they become wet.

Planning for Energy Efficiency
Safe, energy-efficient systems are at the heart of ASHRAE’s mission, and that will be reflected in the new headquarters.

The high-performing systems will have to be efficient and powerful to achieve zero energy in a 41-year-old, multistory 66,700 ft² building in a hot, humid climate.

The HVAC systems will have low life-cycle costs and will provide excellent indoor environmental quality to facilitate the occupants’ productivity while minimizing maintenance requirements. If ASHRAE needs to reconfigure office spaces to meet the Society’s changing needs, the systems will be able to adapt and maintain comfort and indoor environment quality without having to undergo extensive modifications, according to the OPR.

The mechanical systems will be designed to meet and exceed ASHRAE’s standards. The mechanical systems’ performance levels will be designed to maintain space comfort that exceeds Standard 55-2017 requirements. The HVAC system will be designed to use demand controlled ventilation for high-occupancy areas such as meeting rooms and the training center. The building envelope will be tightened and will outperform with the minimum air leakage requirements allowed by Standard 90.1-2016.

As ASHRAE is headquartered in hot, humid Atlanta, humidity levels will operate with less than 60% ventilation, humidity, temperature and more.

ASHRAE has consented to join an initiative to pave a multi-use trail around the lake at the back of the building. The walking trail is a Peachtree Corners initiative that includes 11 miles of trails.

Other resiliency considerations are basing climatic design conditions on future conditions rather than using past climatic design data, and the building could be designed to sustain occupiable conditions in the event of an extended loss of power.
relative humidity during occupied
hours and not exceed more than 65%
RH or a level that will cause con-
densate to form on HVAC equipment
or building elements.

The new headquarters’ occupant
controls and lights will be designed
to be simple and intuitive. The
HVAC systems’ building occupancy
schedule will be easily modified by
zone. The individual occupancy tem-
perature control will be split in the
maximum number of zones that are
economically feasible. ASHRAE will
favor systems that maximize thermal
comfort and zoning.

To achieve zero energy, the design-
ers are considering improving the
existing roof structure to minimize
heat island effect, and the roof could
be used to support a photovoltaic
(PV) array.

The fenestration and solar trans-
mission shall be controlled and
designed in accordance with
Standard 90.1-2016 through glazing
selection and external shading. The
OPR directs designers to consider
high-performance glazing to mini-
mize solar heat gain and maximize
visible light transmittance for day-
lighting. The fenestration system’s
glass-framing will be thermally
broken to help maintain the thermal
integrity of the wall assembly.

The plumbing fixtures will be
selected based on water efficiency.
The design team is directed to find
opportunities for recovering water
effluent from building systems for
potential reuse for building non-
potable end-uses. Effluent assets
include HVAC condensate, storm
water run-off from the roof and
wash water. Non-potable end uses
include cooling tower makeup,
if applicable, toilet flushing and
irrigation.

The new headquarters is being
designed to serve for at least 50
years, so the selected materials
will have to be able to withstand
the region’s weather conditions and
provide years of service with proper
maintenance. HVAC components,
such as coils and compressors, will
be designed to have 20 years serv-
ceable life, and the piping and
plumbing infrastructure will be
designed to have a serviceable life
of 35 years. Lighting systems will be
designed to have 20 years service-
able life, and electrical systems will
be designed to be designed with a
serviceable life of between 35 to 50
years.

High Performing Buildings maga-
azine will follow the new ASHRAE
global headquarters from design
to construction to occupancy and
beyond. For up-to-date information,
visit https://www.ashrae.org/newhq.