The Hurt Building in downtown Atlanta has survived almost 100 years of technical change and history to emerge as an example of energy efficiency and sustainability that can rival the best of its modern peers.

The main shaft of the building was erected in 1913. Said to be the 17th largest office building in the world at the time, it is considered a good example of the skyscraper developed by Louis Sullivan and the Chicago School. World War I delayed the construction of the wings and light court until 1924.

The building has largely tracked technology through the years, often at the front end. The elevators, for example, were upgraded to automatic dispatch in 1953, and the number reduced from 16 to 12 to create floor space. The upgrade was featured in Otis Elevator advertising.

Central air conditioning was introduced to the building in 1956 when a chilled-water cooling system was installed by Carrier Corp. This system is largely unchanged, except that motors have been replaced. Two large air handlers provide constant volume air delivery to perimeter distribution units, which also provide fresh outside air infusion for building comfort. The perimeter distribution units also are equipped with a tempered water coil to provide downstream temperature adjustment according to current condition requirements.

The perimeter system air handlers are presently being outfitted with variable frequency drives to provide incremental starting as well as speed control during atmospherically opportune times.

In addition to the perimeter system, each floor is equipped with two air-handling units supplying the building interior and core areas that are connected to variable air volume distribution boxes. Duct static pressure is accomplished by variable inlet air vanes, with upgrades to variable frequency drives a future possibility.

One of the original R-11 chiller machines was replaced in 2002 with a modern 650-ton variable speed machine. The original wooden cooling tower was replaced as well with a modern unit using variable speed control on the fans.

The second chiller machine was replaced in 2003 with a second 650-ton variable speed machine, giving the building total redundancy in respect to chillers. The operation of these primary machines using variable speed technology is credited to the building’s energy savings.

The building was retrofitted in 1983-84 with a total interior retrofit, plus asbestos abatement (building closed for almost two years). In 1995 an upgrade to T8 fluorescent lighting was added. 2002 and 2003 variable speed chillers replace R-11 machines. 2008 Web-based direct digital controls (DDC) system added. 2008 low-flow plumbing fixtures installed.

By Virgil Sudduth
with allowing the building to earn a high ENERGY STAR score, which is currently 91.

The Hurt Building was an early candidate for a fluorescent lighting upgrade. The building was retrofitted from T-12 fluorescent lighting to T-8 fluorescent technology in the mid-1990s in tenant areas. Maintenance engineers continued the upgrade when all restroom and individual floor mechanical rooms were changed to T-8 technology in 2007, using in-house labor to accomplish the retrofit process. Tenants have been educated in respect to compact fluorescent lighting (CFL) that replaces incandescent in many of their specialty downlights, and many have made the change to the energy-saving technology.

Building management installed motion sensors in all common area restrooms to provide lighting control when these areas are not inhabited. As for the future, the building management system will be used to provide lighting control in many common areas to reduce the light levels during unoccupied times. Stairwell lighting control is also being considered that would reduce light levels in the three egress stairwells as well, saving energy 24/7.

A modern direct digital controls building management system was installed in 2008 to allow building engineering staff to better monitor and set schedules for the building systems. This new system allows engineering to control all aspects of the building, owners, and systems.

To maintain private ownership of this publicly used space, an old law required Hurt Building owners to fence the space for at least 24 hours every seven years. Today, brass markers in the sidewalk confirm the building’s ownership without inconveniencing pedestrians.
The building primary systems, including boilers, chillers, primary pumps, tempered water, fan coil units, cooling tower and ventilation.

This system was installed as a Web-based system, allowing building staff to monitor and control systems from multiple areas within the building, and also from the Web via direct IP address. Considerable utility savings have been achieved as a direct result of the improved access and ability to adjust systems conveniently. As described previously, the building management systems will allow for increased lighting control to bring about substantial utility savings.

As a result of the LEED-EB process, several measures were instituted. The most dramatic is savings in water use in the building.

Water is a critical issue in Georgia, particularly in the city of Atlanta. Original toilets and urinals were equipped with 4.5 gpf and 1.6 gpf flush valves, respectively. To meet the water use prerequisites required by LEED-EB, 40% of the toilets were replaced with low-flow 1.6 gpf units. The remaining toilets were retrofitted with 3.5 gpf flush kits, and all urinals were retrofitted with 1.0 gpf flush kits. Restroom sink aerators (three per restroom) were changed from 1.5 gpm flow to 0.5 gpm units. These improvements were made by building engineering staff at a considerable cost savings for labor.

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The Hurt Building closed completely in 1983 and 1984 for complete renovation and asbestos abatement. The process was timed to coincide with the move of its major tenant, Southern Bell, which had built a major office building nearby. The grand lobby was completely renovated in 1985. It has rose granite walls and black marble floors.

The triangular form of the Hurt Building was dictated by its irregularly shaped site at Five Points in the city center of Atlanta. At 18 floors, the building was said to be the 17th largest office building in the world when construction started in 1913. The building opened about Oct. 1, 1913, after the main shaft was completed. World War I delayed the construction of the wings and light court until 1924.
The building's most notable architectural feature is a three-story, street-level rotunda that has a moderate dome set on marble columns. The domed ceiling is decorated with starbursts and gold leaf panels. Other classically derived elements are the balustrade located on the top of the rotundas and pilasters that separate the windows of the ground floor. Most of the building's windows are original, as are the ornate doorknobs. The steps leading to the rotunda are made of Alabama white marble. This marble was removed, revealing the white marble for the first time in decades.

Payback on materials was less than six months. When 2009’s actual usage is compared to 2008, indoor fixture water use was reduced 27% for an annual water savings of 1.3 million gallons, or an annual cost savings of $29,000.

The Hurt Building has a rainwater collection system in the building’s basement, which redirects rainwater from the building roof and stores that water in two 500 gallon tanks. The original intent of this system was to stop flooding of the basement level, but has since been used to store water for interior plant irrigation. A reclamation system also was installed on the primary air handlers, storing water from the condensation at the chilled water coils and delivering it to the cooling tower basin to replace purchased utility water.

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Staples
- For details on the program and presenters, visit www.ashrae/Cxwebcast.com.
Much of the Hurt Building’s air-handling system stands just as it was in 1956. Motors have been replaced, chilled water coils have been changed out, but other parts, such as the steam coils, are original. And, the system still works as designed 54 years ago.

**Air-Handling System.** Tempered air is delivered to perimeter terminal units from two large built-up air handlers located in the penthouse. This air can be discharged either as cool base temperature air (about 58°F to 60°F), or can be discharged as warm air for heating purposes during cold weather or morning warm-up. The built-up air handlers are divided from a common return air plenum and have the ability to control discharge air temperature using a number of methods.

The units are designated as north and south, with the south approximately one-third larger to handle the building’s sizable sun load absorption. The south air handler delivers air to all terminal units that face either south or east, with the north unit delivering air to all terminal units facing north.

Each air-handling unit is equipped with preheat coils for freeze protection, as well as individual circulated chilled water coils for cooling and dehumidification. Each unit has an individual reheat coil used to raise the discharge temperature when needed. The two units also are equipped with outside air and exhaust dampers to provide an air-side economizer to deliver cooling using cool outside air when conditions are favorable.

**Hydronic System.** Each perimeter discharge unit is equipped with a circulated tempered water coil that allows for local control of actual discharge air temperature to the building tenants. This water is temperature regulated using either a steam-to-water heat exchanger to warm water, or by using actual chilled water for cooling purposes. As with the air handlers, a north and south water loop allows versatility for meeting the building’s needs.

Heating is accomplished by low-pressure steam, which is used in the preheat coils, reheat coils, and in the tempered water heat exchanger described previously. Two boilers are used for steam production. One is 18 hp, and a second is 250 hp. These boilers are fired by natural gas supplied by the local utility. Lobby level retail spaces, as well as the restaurant and tenant data rooms use water source heat pumps for heating and cooling. A separate tenant loop circulates condenser water throughout the building 24 hours a day. This loop uses a plate-and-frame heat exchanger to reject heat by means of the building cooling tower.

**Building Management System.** The building management system was upgraded in 2008, providing a computerized control system, with most actuators remaining pneumatic. This system is accessible from multiple points using the management company’s local network, and is also Web based to allow access from outside the building using a dedicated IP address. This allows building engineers to check systems operations from multiple stations as well as from home or from a laptop.
Sustainability at The Hurt Building has expanded more than originally envisioned. In addition to a standard recycling program that includes paper, plastic, aluminum, glass and cardboard, a furniture recycling center was instituted. This center offers an alternative to tenants who buy new furniture and need to dispose of or donate their original pieces. Viable items are moved to the furniture recycling center, where any other tenant who might be able to reuse that item can take it free of charge, rather than it being removed to a landfill. Recently, a nonprofit tenant moved to The Hurt Building, and was able to furnish their entire office of three individuals at absolutely no charge to their organization.

In addition, an e-waste recycling program that collects all electronic waste including toner cartridges was established. It allows tenants to place electronics into the center for reuse by other tenants, or if non-functional, to be recycled.

A partnership with the Bobby Dodd Institute of Atlanta, the largest employer of persons with disabilities in the southeast, facilitates the recycling of used toner as well as offers recycled and refilled toner cartridges for purchase. Many Hurt building tenants buy their toner cartridges from the institute.

Managing your property in a highly performing and sustainable way will soon be an industry standard. The Hurt Building is a great example that a building’s age and construction is not necessarily a barrier to being an industry leader in high performance and sustainability.

**Lessons Learned**

**Get Tenants Involved**
Tenants must be on board for sustainability initiatives to succeed in a multi-tenant high rise office building. The tenants at the Hurt Building are primarily nonprofits, foundations and lawyers. These civic-minded people were the driving force behind many of the green initiatives.

**Hire an Experienced Consultant**
We credit our consultant for getting LEED-EB Gold, instead of LEED-EB Silver. We sometimes give them credit that we have a plaque at all.

**Green Initiatives Pay**
Low-flow plumbing fixtures pay for themselves, often in the first year, and the benefit continues indefinitely. “Green” vendor contracts are made where possible. At the Hurt Building, janitorial, HVAC water treatment, pest control and window cleaning are all “green” contracts. In each case, the contract expense decreased, often because the products are less expensive.

Increased recycling reduces waste removal expense. Trash handling contracts can be renegotiated as more is put into recycling and less into the landfill. A waste stream audit can highlight the areas of improvement for your building.

**Recycled Paper Products Have Improved**
Recycled paper products are better than they used to be. Not so long ago, using recycled toilet paper and paper towels in your restrooms was certain to get your tenants complaining. Currently, there are coreless, recycled toilet paper products as well as recycled hand towels that are as soft and durable as the less environmentally friendly products of the past. Make the switch.

**Use the ENERGY STAR Web Site**
Use the ENERGY STAR Web site to track building performance and highlight areas that are easy to improve. The Web site is a free service, so you can use this information and benchmarking comparisons even if you are unable to qualify for the ENERGY STAR label. Through benchmarking on the ENERGY STAR site, The Hurt Building has reduced electricity use by almost 15% over the last three years.

**Ornaments at the top of the building.**

**About the Author**

Virgil Sudduth has served as chief engineer at Hurt Building since June 2006. He previously served (1998–2006) as chief engineer at Woodruff Arts Center, a nine-building complex that includes a museum, symphony hall, live theater, art conservation and storage, parking, college campus and residence. He is a trained electrician, earning his journeyman status in 1978 and his master license in 1983.