# Changing Colors: GREEN BUILDING STRATEGIES TO UPDATE

## Going green demands a change of mindset

**"IN TEXAS, AND IN THE SOUTHERN UNITED STATES, THE AIR CONDITIONING EQUIPMENT IS ALMOST ALWAYS THE LARGEST CONSUMER OF ELECTRICITY. THERE IS A LOT THAT CAN BE DONE TO INCREASE THE EFFICIENCY OF THE AIR CONDITIONING SYSTEMS. A LOT OF IT REQUIRES A CAPITAL INVESTMENT ON THE FRONT END, BUT IT HAS VERY ATTRACTIVE PAYBACKS."**

— Carter Bliss, director of facilities, Memorial Drive Presbyterian Church, Houston, TX

# YOUR EXISTING FACILITY

## and some sleuthing skills

By Carolyn Heinze

Where at one time the environmental movement was just that—a group that remained, for the most part, on the fringe of the collective conscience—the implementation of greener practices has become a major part of our daily lives. Organizations across the globe are endeavoring to decrease the negative impact they place on the planet, and churches are increasingly instrumental in doing their part by making their facilities greener.

Jim Rowan, church business administrator at Central Baptist Church in Round Rock, Texas, believes that churches are well positioned to set a good example on the importance of going green. "We should be in the forefront of the environmental movement because we are concerned about that part of His creation," he says. "It also gives us an inroad—because we've given that leadership away, and it's been taken up to a group of people that we refer to derogatorily as tree-huggers, people that are concerned about the environment. What a great bridge between outreach and in-reach into our community when we say that we care, too."

### Intensifying Green Efforts

Over the past three years, Central Baptist has worked to decrease its environmental impact by attacking a number of different parts of the facility. The facilities staff has replaced its T-8 eight-foot light fixtures with more efficient T-12 four-foot ones, and has changed out all of the incandescent light bulbs with compact fluorescents. All paper—whether generated at the church or at its adjoining school—is recycled. The construction of the facility's new 36,000-square-foot education building was conducted according to the neighboring City of Austin's Green Building program, and all of the concrete, asphalt, scrap, and trash were separated and recycled in an effort to lessen the project's impact on the county landfill. "Doing this was pretty much cost-neutral," Rowan explains. "It's more about organization: first, we will pick up all of the wood and dump it; then we will pick up all of the rocks because they go in a different box. It's more about training and having the workers do it rather than it being an out-of-pocket expense."

To conserve energy, radiant barriers were incorporated into the construction, and the new HVAC system features oxygen sensors that regulate the intake of ambient air (ultra-violet light emitters ensure that the re-circulated air is fresh and clean). Rowan concedes that it has been difficult to judge how, exactly, these endeavors have affected the church's electricity bill, mainly because the facility grows in square footage continuously. "The electrical bill tends to be more every year, but it's not significantly more," he says. "Per-square-foot electrical charges are less each year."

In the future, Central Baptist aims to install a rainwater recycling system that collects rainwater to use for irrigation instead of using the treated water from the city. "Hopefully, eventually, it [will] pay for itself: we would have to put in a tank and a pump, and have the ability to pipe it into our existing sprinkler systems," Rowan says. "There is no sense in spraying treated water onto the grass. It's not necessarily the best thing for the grass, and there is a lot of energy in treating the water."

**Carter Bliss**
Director of Facilities,
Memorial Drive Presbyterian
Church, Houston, TX

At Memorial Drive Presbyterian Church in Houston, Texas, the main focus has been on improving energy efficiency. "In Texas, and in the Southern United States, the air conditioning equipment is almost always the largest consumer of electricity," reports Carter Bliss, director of facilities. "There is a lot that can be done to increase the efficiency of the air conditioning systems. A lot of it requires a capital investment on the front end, but it has very attractive paybacks."

One of the key components to Memorial Drive's initiative was the replacement of the church's existing chillers with new units that are equipped with variable frequency drives, which have a return on investment (ROI) of five-and-a-half years. The church also utilizes a building automation system to regulate lighting based on whether areas are occupied or not. Outdoor lighting is controlled through a combination of time schedules, photocells, and motion detectors. "By having that tied into a building automation system, you can closely tailor the schedules of the lighting to the events in the facility," Bliss says, noting that his church installed a system by Johnson Controls that can be accessed remotely via the Internet.

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— Bill Schafer, director of product and channel development, Crestron Electronics Inc., Rockleigh, NJ

To maximize the efficiency of the HVAC, Memorial Drive employs a calendar program that monitors the events that are taking place each day along with the rooms in which they are being held. "We start the AC just minutes to an hour before the event, depending on how warm or cold it is outside, and we shut it off right at the end of the event so that we are not wasting energy heating and cooling rooms that are not being used," Bliss explains. A combination of time schedules and motion detectors are applied to the restrooms, so that these areas aren't lit when no one is in them.

## Automation Systems Improvement—a Natural

Bill Schafer, director of product and channel development for control systems manufacturer Crestron Electronics Inc. in Rockleigh, New Jersey, notes that automated systems have been green for a very long time. "The whole nature of a control system is to turn things on when they need to be on, and turn things off when they need to be off," he says. The key, he

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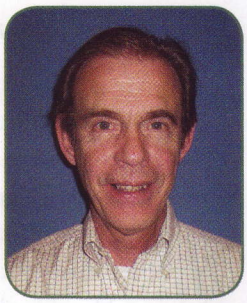
**Bill Schafer**
Director of Product and Channel Development, Crestron Electronics Inc., Rockleigh, NJ

underlines, is that these systems are well programmed so that facilities can take advantage of the features they offer. "Have it programmed so that it really maximizes efficiencies, and looks for things like no motion in an area. Is this a time when there should be a service going on? No, it's Monday afternoon, there is no service going on, and there is no motion. Let's make sure that the lights are shut off and that the air conditioning is turned down. It's really about thinking out the application and figuring out how you want the system to work."

Memorial Drive is currently examining a system that provides power factor correction and surge suppression, which, according to Bliss, offers a 15% ROI. Bliss's team recently performed some upgrades to reduce water consumption in the church's cooling towers, and Bliss is currently investigating a campus-wide plan that will reduce water consumption in the church's irrigation system by 30% to 35%. Bliss is also examining the feasibility of installing a 1.5 megawatt generator for the entire campus.



**Hugh Veal**
Business Development, Structural Preservation Systems LLC, Elkridge, MD

To determine the scope of a church's energy costs, Bliss advises the enlistment of an outside professional. "The first thing that I suggest they do is some type of audit or analysis," he says. "Hire

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a specialist and see where your energy dollars are going."

This involves what Hugh Veal, in business development for Structural Preservation Systems LLC, a specialty contracting company in Elkridge, Maryland, dubs "detective work." "You isolate what the existing problem is—whether it be moisture penetration, energy conservation, mechanical operation of windows and doors, and so on," he explains. "You superimpose compliance with up-to-date codes and life-safety requirements. Then you begin to examine the pieces that construct the envelope of the building, with an eye on the improvements that can be made, the impact that they will have, and if they are most likely to pay for themselves in BTUs, or money."

In many cases, this starts with an assessment of a facility's windows and doors. "If we have cold air blowing through the side of the building, we know that we have to look at infiltration, which is usually solved by caulking and weather stripping," Veal explains.

Mechanical systems may also be inefficient, dictating the need for a new heating and air conditioning system—technologies that have become more energy-efficient over time. Or, perhaps there is nothing wrong with the system, except for how it is configured. "Maybe the heating and air conditioning system is functioning, but it needs to have the load taken off of the mechanical system," Veal illustrates.

## BECOMING A GREEN BUILDING LEED-ER

Developed by the U.S. Green Building Council (USGBC) in Washington, D.C., the Leadership in Energy and Environmental Design (LEED) Green Building Rating System is the national benchmark for high performance in green buildings. LEED standards help promote sustainable practices in the design, construction, and operation of facilities. Certified companies such as mechanical contractor Calvert Jones Company Inc. in Houston, Texas, are authorized to implement LEED practices into their projects, and once all of the USGBC guidelines have been met, the facility itself may become a LEED-certified building.

"There is a criteria that you have to go through: you have to have a company like us come in, evaluate the building, answer all of the questions, put a report together, and then we can say how to get the building certified," explains Stan Peregoy, president. "You have to have the exterior envelope of the building analyzed."

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Rowan suggests that one part of going green is to re-assess how the church is treating its grounds. "I would start on the outside," he says. "The use of chemicals is horrible for the environment." While environmentally friendly products may cost more initially, he notes that plants gain more nutrients from them. "Although it's cheaper to buy chemical fertilizers, 80% or 90% of that nitrogen is washing down into the water table when it rains."

While not all churches have the financial resources to make major changes, that doesn't mean that they are excluded from going green. Given the cost of energy—which is continually rising—churches are wise to begin incorporating green initiatives into their budgets. Stan Peregoy, president of Calvert Jones Company Inc. in Alexandria, Virginia, a mechanical contracting firm, notes that rendering a facility more efficient doesn't have to be done all at once. "We know that people don't have money growing on trees to become green, more energy-efficient, and more sustainable," he says. "Start with the little things, like water consumption. Once you have done as much as you really can do for free, start examining what you can plan for in the future."

Bliss also points out that some utilities offer grants, or incentives, for organizations that are attempting to minimize their energy consumption. "When we did our major equipment replacement about six months ago, we applied for an incentive from the utility company," he recounts. "We got a $40,000 incentive from them." While applying for these takes a bit of work, Bliss notes that many church congregations boast people with the expertise to help out. "[Some members may be] electrical engineers, and they will understand the terminology and have the wherewithal to do these applications that are very complicated sometimes, and apply for these rebates."

***Carolyn Heinze is a freelance writer/editor.***

QUICK-LINKS

**Calvert Jones Company Inc.**
*Mechanical contractor*
*(703) 370-5850*
*www.calvertjones.com*

**Central Baptist Church**
*Round Rock, Texas*
*(512) 388-3408*
*www.centralbaptist.org*

**Crestron Electronics Inc.**
*Control systems manufacturer*
*(800) 237-2041 or (201) 767-3400*
*www.crestron.com*

**Memorial Drive Presbyterian Church**
*Houston, Texas*
*(713) 782-1710*
*www.mdpc.org*

**Structural Preservation Systems LLC**
*Specialty contracting services*
*(410) 796-5000*
*www.spsrepair.com*

**United States Green Building Council (USGBC)**
*501(c)(3) non-profit community of leaders and resources*
*(800) 795-1747*
*www.usgbc.org*