



17725 Volbrecht Road • Lansing, IL 60438  
Telephone 708.418.0900 • Fax 708.418.5100

FOR IMMEDIATE RELEASE  
August 11<sup>th</sup>, 2009

Contact: Tim Brown  
773-954-2114  
tim@eblmarketing.com

### **Tallest Church Building on Earth Will Green Up**

**Chicago, Ill.** – One of world's oldest skyscrapers is about to get a new, green lease on life.

The historic Chicago Temple building, home to the oldest church congregation in Chicago and a signature feature of the nighttime skyline, will undergo a top-to-bottom systems upgrade next month. The innovative green reconstruction project is the brainchild of a crack team of architects, engineers, sustainability experts and HVAC specialists, and will culminate in a complex and delicately timed logistical maneuver on Nov. 7 involving a massive mobile crane whose parts must be trucked in on thirteen tractor-trailers. Sixteen additional tractor-trailers will carry 30 air handling modules, which will be hauled onto the top of the Temple and assembled into a two-story custom air handling unit. The maneuver will shut down the city's central business district for a weekend of heavy lifting that will turn the building's mechanical systems green without leaving a visible trace on the venerable 23-story structure.

The project will be a joint triumph of historic preservation and green technology.

In piecing together the details of this radical systems overhaul, the architects and engineers had to work within the inherent limitations of the historic structure while at the same time meeting the demands of 21st-century building standards as well as the needs of the building's occupants. These strictures led the team toward a variety of unprecedented solutions and design features that make the renovation completely unique. In the words of Sachin Anand, principal at engineering firm dbHMS, "This was a big jigsaw puzzle which we figured out together."

### **Objectives: Energy Savings, Air Quality, Noise Reduction**

"Here we have a building that is nearly one hundred years old, whose structure is sound, and whose historical significance is undeniable," said John Attanasio, Vice President of Marketing at Temperature Equipment Corporation. "The building's *systems* were not sound, though. Several creative people have put their heads together and come up with an innovative solution that preserves the building's beauty and integrity while turning it green – just on the inside, of course." TEC, based in Lansing, Ill., is the Chicago area's largest distributor of HVAC equipment and specializes in high-efficiency Carrier brands for residential, commercial and industrial applications.

Building owners first sought the services of architectural firm Hasbrouck Peterson Zimoch Sirirattumrong with the following objectives for revamping the Temple's mechanical systems:

- **Energy savings.** Working with sustainability expert Rob Rafson of Full Circle Sustainable Management Solutions, building owners have already made changes to lighting, replaced single-pane windows with R-3 units, insulated the roof and installed efficient chillers in the basement of the Temple. But the custom air handling unit is at the core of the overall energy savings for the building, Rafson said.

The building's total energy usage will be slashed by more than half. Rafson's firm helps companies make sustainable changes to infrastructure and business practices in a way that maximizes the return on their investment. Thanks to Full Circle's guidance, building owners are eligible for a one-time \$500,000 federal tax break this year and a \$100,000 utility-based (ComEd) incentive, in addition to approximate annual energy savings of nearly \$185,000. The building's carbon dioxide emissions will be reduced by 4,743,000 pounds per year – the equivalent of the annual carbon footprint of 118 Americans.

- **Indoor air quality improvements.** Positioned in the thick of the Chicago Loop, the city's bustling central business district, and still utilizing equipment installed in the 1950s, the Temple does not currently meet modern air quality standards. The project team chose Montreal-based Racan, a wholly owned subsidiary of Carrier Corp, to design the custom air handler. Racan accepts ASHRAE standard 62.1 as a baseline for its work, but having designed custom air handling units for schools, hospitals and pharmaceutical facilities, the company has developed advanced filtration and water management technologies. Like all Racan units, the Temple AHU will feature panels that are easily wiped down, dual-sloped stainless steel drain pans to prevent standing water and other humidity and pathogen controls to increase occupant health and satisfaction. Racan has designed and manufactured custom AHUs for facilities around the world, including the Bank of America building in Manhattan, the Global Hawk Air Force Base in Guam and the Chicago Midway Airport.
- **Noise reduction.** The Temple's current air handling system disrupts church services and other events in the sanctuary. The custom AHU, placed outside the building, will solve this problem for parishioners. Racan's signature variable frequency drives and noise reducing technologies will make the entire building much quieter for all occupants, even while circulating 235,000 cfm throughout the Temple's 23 occupied floors.
- **System Control.** Delta Controls Chicago is developing software that will allow fine control of the AHU, the chillers and other aspects of the HVAC system. Right now, pneumatic controls are adjusted manually on each floor of the building. With the installation of Delta's equipment, customized for the Temple's needs, temperature, humidity and air flow will be adjusted from a computer in the engineer's office. The system is remotely Web-accessible, and can also send e-mail or text alerts if something goes wrong with the system. “Delta's systems are fully customizable for every building,” said product manager and engineer Keir Briscoe. “The features are really up to your imagination.” Briscoe said the most unique challenge of the Delta Controls system will be “making each fan aware of what the others are doing,” so that the custom AHU will be able to run in the event of a fan failure, and during maintenance.

**Design Considerations: Historic Preservation, Tenant Needs, Urban Job Site**

The Chicago Temple's brand new AHU will be an unconventional solution – but, given the design considerations, it is probably the only workable one.

- **Historic Preservation.** The Temple's age and status made historic preservation the paramount concern for building owners and the project team. “The equipment on the roof will be 20 or more feet high,” said Jim Peterson, architect and engineer at HPZS. “But because of the tower on the north end of the building, we were able to design this so that only the barest slivers will show.” The entire air distribution system will also be camouflaged on the exterior. “The duct coming down from the roof to the fourth floor level is very large,” Peterson said. “On a lot of buildings, that would be pretty hard to hide!”

Peterson's firm has helped preserve the architectural integrity of many historic buildings, including three of the most significant Frank Lloyd Wright homes, and his admiration for the Temple is obvious. “No one builds buildings like this anymore,” he lamented. “They have so much character.” The Temple's neo-gothic carved limestone tower and spire, Peterson said, have made the Temple a Chicago landmark. Thanks to the innovative solutions the project team has presented, right down to the paint color (Brandon Beige, #977), the landmark's profile will not be marred by the addition of the custom system.

- **Occupant Needs.** While environmental sustainability was a major goal, the building owners also rely on tenants for fiscal sustainability. Any major disruption of tenants could disrupt the building owners' financial health. Installing the custom AHU and the main duct on the exterior, and primarily during non-business hours, ensures minimal disturbance.
- **Urban Job Site.** The Chicago Loop is a densely built-up section of the city that includes the convention center, the Sears Tower and the courts. Urban density and city regulations affected the final AHU design, which had to take into consideration what type of crane would be lifting the modules onto the Temple roof.

### Unique Features of the Custom AHU

- **Scale.** According to Racan Sales and Marketing Manager Brian Monk, putting an AHU of this scale on the roof of a building is an unprecedented choice. “We are probably the only company in the world that would even entertain a project of this size,” said Monk, noting that the transport and rigging logistics alone were a complex puzzle that determined the final design of the custom unit. The unit itself, Monk said, was manufactured in 30 modules over a period of 20 weeks. Each piece was marked ahead of time to ensure the accuracy of lifting sequence and assembly during the 48-hour maneuver. Logistics are being coordinated by Hill Mechanical Services, an affiliate of Hill Mechanical Group, Chicago's largest trade contractor.
- **Special Calculations.** Because of the size of the unit – “basically like a two-story mansion on top of a building,” according to Monk – the custom AHU had to meet the standards of the International Building Code. For zoning purposes, the City of Chicago considers the AHU a two-story prefabricated structure. Seismic, wind and load calculations were incorporated into the design. In fact, the custom unit will be anchored to the Temple – an unprecedented safety measure for an air handling unit.
- **Internal Mechanical Room.** Because of the unique placement of the custom AHU, Racan has worked the mechanical room right into the unit. “It will be like walking into a two-story

condo,” said Monk – though he admitted that it might feel a bit more like a wind tunnel than a home. The unit uses floor grating for walkways and stairs to ensure full air flow through the unit along with full accessibility for maintenance and repairs. “Once you see it assembled,” Monk said, “it will be amazing.”

In order to make it all happen Nov. 7, Hill Mechanical Services has brought together a diverse team of industry innovators in order to arrive at a creative solution that preserves the architectural heritage of this historic structure while bringing the Temple's mechanical systems into the 21<sup>st</sup> century. Though the project team is diverse – comprised of dbHMS designers and engineers, HPZS architects, Racan-Carrier air handling specialists and TEC equipment distributors as well as sustainability consulting firm Full Circle – its members all agree on one thing: in order to respond effectively to the threat of global climate change, the world is going to need a lot more projects like this one. Perhaps it is fitting that Chicago, the “birthplace of the skyscraper,” could also turn out to be a pioneer in the next phase of global competition: who can become the greenest the fastest.

“This project proves that, with careful planning, even the most beautiful old buildings can be modernized from the inside out, without harming architectural heritage and integrity,” said Attanasio. “It saves the owners money, and cuts dangerous carbon emissions dramatically. I hope more historic structures throughout the world will follow suit.”