

# LEED Silver Mission for Philly Not-For-Profit Stays Lean With Affordable HVAC Design

**Mercy Family Center initiates urban neighborhood revitalization by renovating abandoned warehouse into \$7 million green showcase.**

**Philadelphia**—Not-for-profit organizations rarely construct green buildings, however Mercy Neighborhood Ministries of Philadelphia (MNMP) proved careful cost planning can produce a sustainable design that pays energy-saving dividends for years to come.

Proof is the new 32,000-square-foot Mercy Family Center, an 85-year-old, former industrial storage warehouse the MNMP design team retrofitted into a green building showcase that earned a Leadership in Energy and Environmental Design (LEED®) silver certification. Led by Sister Ann Provost, MNMP's executive director, the design team included Philadelphia firms: Brawer & Hauptman Architects; consulting engineers, Elliott-Lewis; and general contractor, The Sullivan Company, Essington, Pa.

"We wanted a green building from the beginning, but it was Brawer and Hauptman that introduced us to LEED," said Sister Ann, who gathered project funding through private donations and conventional bank financing. "Building material choices were chosen according to budget and then sustainability, therefore going green only added about one percent to the budget. This is considerably lower than typical green buildings."

The building structure, for example, was improved with energy efficient window replacements, skylight refurbishment to allow more natural light, wall/roof insulation, a white reflective roof and the use of recycled building materials. The renovation was accomplished while still retaining the 1920's character of the building, according to the Preservation Alliance of Greater Philadelphia, which recently presented the Mercy Family Center with a "Preservation Achievement Award."



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## Ventilation Design Racks Up LEED Credits

The HVAC systems also accumulated LEED credits to help achieve silver certification. The air distribution system uses Verona™ commercial fabric duct by DuctSox Corp., Peosta, Iowa, with a Comfort Flow air dispersion featuring a linear arrangement of round L-Vents, which were designed to provide 25 to 50-cfm/linear foot of airflow. Del-Ren Associates, a Philadelphia-based air distribution manufacturer's representative, provided design assistance and was the liaison between the fabric duct manufacturer's custom engineering department and Elliott-Lewis' sales engineers, Ed Silcox and Nick Simonetti, and The Sullivan Company's Erik Fay, P.E., senior project manager.

When combined with Comfort Flow's factory-engineered permeability that allows approximately 15-percent of the supply air to flow through the fabric itself, the ductwork's dispersion provides even air flow versus the hot spots and drafts associated with metal duct/register systems. The evenness also results in less equipment run-time, which saves additional energy. Fabric duct contributes to LEED credits, because it eliminates the need for protective metal duct coatings and the volatile organic compound (VOC) off-gassing associated with them; reduces jobsite waste because of custom manufacturing for the application; increases mechanical equipment efficiencies due to better air dispersion than metal duct; and improves air quality among other factors.

Choosing fabric duct versus metal duct also contributed to an estimated 10 and 20 percent savings in materials and labor, respectively, according to Fay. Modern Sheet Metal, Bristol, Pa., installed the fabric duct and fabricated the metal plenums and adaptors required in connecting fabric duct to HVAC equipment.

Cost savings are irrelevant without performance and occupant indoor air comfort, however. "We've noticed a significant difference in air comfort with fabric duct versus metal duct at the Mercy Family Center, which is important with occupants that are elderly or very young," said Sister Ann.

Aesthetically, the fabric ductwork also looks more streamlined than its metal counterpart. The duct also subliminally segregates the MNMP's two licensed programs, Child Care and Adult Day, with color coding of blue and tan, respectively. The MNMP round ductwork ranges from 8 to 32-inches-in-diameter, is

hung from an H-Track suspension system, and uses a variety of up-flow (2 and 10-o'clock) and down-flow (4 and 8 o'clock) airflow combinations. The children's arts room is accented with primary red ductwork in a D-Shape that fits snugly and unobtrusively into the small, narrow room's ceiling/wall cranny. "We ordered the fabric duct colors we wanted, which made painting metal ducts with coatings unnecessary along with the VOC's associated with them," said Fay, who specified fabric duct for The Sullivan Company's own offices, recently.

## Mechanical Systems Provide High Efficiency

Another HVAC component adding to LEED credits is a high-efficiency 50-ton rooftop unit using environmentally-friendly refrigerant. The system divides the building into 15 zones each controlled by variable air volume (VAV) boxes and building automation system control. The entire system contributed to LEED credits. In-duct sound attenuators also contributed to LEED credits.

The design team had considered other alternatives such as multiple rooftops, however the single rooftop unit and VAV boxes were chosen for the ability to shift loads more efficiently while using less tons of air conditioning.

Not-for-profit organizations typically don't emphasize green building and rarely apply for LEED certification because of strapped budgets. However the creative financing talents of MNMP and the penchant to improve the local environment has helped create a facility that other not-for-profit organizations are now using as a sustainability role model.



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9866 Kapp Court • Peosta, IA 52068  
Ph: 866-382-8769 • Fax: 563-588-5330

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