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Lee's Summit Going Green and Saving Green

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Article adapted from the Lee's Summit R-7 District website.

The Lee's Summit R-7 School District is continuing to increase its emphasis on energy saving or "green" facility and other capital improvements by using federal funding and savings generated by reducing fuel and utility costs.

During the Feb. 18 Board of Education meeting, R-7 officials provided a report on initiatives related to new school construction as well as school additions, renovations and upgrades at existing schools and support facilities. Recent R-7 no-tax-increase bond issues, as well as the April 6 no-tax-increase bond issue, are also incorporating energy saving practices into construction plans.

As a rapidly growing school district, Lee's Summit R-7 has constructed 22 new school and support facilities over the past 20 years while also completing numerous additions and improvements at schools. Throughout the past two decades, new school construction efforts have increasingly focused on sustainable, cost-effective measures designed to save money while providing a safe, healthy environment for students and staff members.

This next year, Lee's Summit R-7 is completing the final scope of work on the sixth phase of its ongoing energy saving performance contract program. These efforts have included lighting upgrades, heating/ventilation/air-conditioning improvements, water-usage savings and boiler and chiller upgrades. The facility improvements are taking place at 13 school sites with work occurring between April 2010 and August 2011. The capital improvements will be completed

without increasing the district's operating budget thanks to funding from voter-approved no-tax-increase bond issues as well as grant funds and ongoing energy savings. Performance contracting began in 2002 within Lee's Summit R-7 and is projected to save more than \$4.4 million in energy costs over the next 15 years.

In addition, the R-7 School District is planning to replace four inefficient diesel vehicles with four electric vehicles (pictured below). These electric trucks were purchased from Smith Vehicles which are manufactured in Kansas City. They will be used by distribution employees who work throughout the school district. The trucks will be purchased with the assistance of matching federal economic stimulus funds from the U.S. Department of Energy and will generate considerable fuel-cost and maintenance savings.

The trucks are very efficient to operate (8 cents per kilowatt) and have only four moving parts making them extremely quiet in school zones. Their average range is 100 miles on each charge and the average charging time is eight hours. Their top speed is 50-55 mph. Over the course of the 15-year program the district will save nearly \$80,000 to go toward other capital needs.

Beginning in May 2009, the R-7 School District also initiated a district-wide recycling program that provides schools and the community with convenient recycling drop-offs at each school while generating revenue for the school district. Since the programs inception, the school district has generated nearly \$8,000 dollars for schools, redirected nearly 75 percent of its solid waste from landfills. It has also provided students, staff and families with an additional recycling option, often allowing them to save money by eliminating their curbside recycling bill. In 2010 this program is forecasted to grow as public awareness increases and additional vendors become available.

In 2009-10 the district initiated a new contract to recycle, reuse or properly dispose of all outdated electronic devices. Since the contract was awarded the district has received over \$36,000 in commissions and has incinerated hundreds of cartridges and components turning the "waste" into concrete mix materials used in the construction of highways, sidewalks and driveways.

"Going green is generating green for our students," said Ron Cox, R-7 director of purchasing and distribution.



Green Schools Summit Hosted by MCSA Outreach

About the Summit

The Green Schools Summit, previously scheduled for June 15th, has been postponed till next spring in response to the tight budgets many districts are facing. The Summit will focus on students, community and culture. The visionary summit breaks away from old concepts of facilities and systems and presents an innovative approach to incorporate students and the community into "green" projects. The summit will highlight successful examples from Missouri and around the world of how K-12 schools and higher education institutions are redefining success. They are transforming what "green" means for students and the commu-

nity while driving the culture to high performance. In this turbulent economic period and the fierce global competition facing our country the status quo isn't acceptable for our youth. Join us next spring and learn how green and sustainable high performance learning environment improvements can have a positive economic and transforming cultural impact on your students and community.

About the Speakers

Robert J. Kobet, AIA, is President of Sustainaissance International—a multi-disciplined architectural consulting firm specializing in sustainable design and development, high performance LEED Certified buildings and environmental education.

Missouri Representative

Jason Holsman truly understands going green and the needs of Missouri schools. He is sponsoring HB 1578 which establishes the Solar and Wind Incentive Program to allow for rebates for the installation of solar photovoltaic systems. **Dr. Tom Kurucz** is Associate Superintendent of Management Services for the Lee's Summit R-7 School District. The R-7 District has been a leader in seeking innovative and creative methods to finance new buildings and renovation of existing schools by using alternative funding methods for the private sector. **Dr. Betty Roberts** is the Vice President of Administration and Finance at the

University of Central Missouri. In May, 2009 the University embarked on a \$36.1 million project that will radically reduce energy consumption and the University's carbon footprint on the Warrensburg campus, while making a significant improvement to the academic learning environment. **Dr. Allan Markley** is Superintendent of Raytown C-2 School District. The C-2 District is a state leader in clean, renewable energy for K-12 facilities. The District installed geothermal wells in 2000 and in 2009 about 80 percent of the buildings in the district were heated and cooled using geothermal technology. *More information on this event will be released as it becomes available.*



Benton Elementary School, One of five Columbia schools recognized for superior energy performance.

Columbia Schools Earn Efficiency Award

Columbia, MO --

Five elementary schools in the Columbia Public School District have been recognized for their superior energy performance, placing them in the top 90th percentile of all schools in the country for energy performance.

The five schools include Benton, Blue Ridge, Fairview, Parkade and Russell Boulevard elementary schools. Each of the schools had air conditioning

and energy projects, including the installation of ground source heat pumps, completed using bond funds approved by voters in 2007.

The Environmental Protection Agency's national energy performance rating system provides a 1 to 100 scale that helps organizations assess how efficiently their buildings use energy relative to similar buildings nationwide. A building that scores a rating of 75 or

higher is eligible for the Energy Star Award.

The five schools that have earned the recognition use an average of 35 percent less energy than typical school buildings and also release 35 percent less carbon dioxide into the atmosphere. The recognition makes these schools five of 26 that are energy star rated out of more than 2,500 school buildings statewide.

"Park Hill is the first school district in the 17-year history of this award to earn the distinction."

Park Hill Received the Missouri Quality Award

The Park Hill School District received the Missouri Quality Award. Park Hill is the first school district in the 17-year history of this award to earn the distinction.

The Missouri Quality Award recognizes an organization's commitment to meeting its customers' needs and to using the best-available processes for everything it does. This award is aligned with the exacting standards of the Malcolm

Baldrige National Quality Award.

Park Hill spent the last several years aligning processes with these standards. District administrators Dr. Mark Miles and Dr. Jeff Klein spent months working through the application and the site visit.

The Missouri Quality Award demonstrates to the Park Hill community the world-class level of excellence the schools are achieving. It also comes with a detailed

report from the site-visit team, which will identify both strengths & opportunities for improvement.

"This award shows our commitment to continuous improvement," Dr. Fisher said. "It would not have been possible without the people here in Park Hill. Our teachers and support staff are second to none, and our parents and community provide the support we need to achieve these great heights."

Designing High Performance Green Schools

By Scott P. Hardwick

While school business officials face a multitude of issues, one of the most significant challenges remains; how to fund facilities, technology, and programs to create productive learning environments that are fiscally responsible to tax payers. While some facilities are getting upgrades, most districts continue to base designs on minimum code requirements. This is unfortunate because many children and teachers will spend their days in facilities that just barely meet minimum health and safety standards. Some schools are justifying a greater investment in "Going Green," and the benefits are many.

According to the U.S. Environmental Protection Agency (EPA), high performance schools result in higher test scores, increased average daily attendance, increased teacher satisfaction and retention, reduced liability exposure and reduced environmental impacts.

Moreover, according to studies cited by Gregory Kats in *Greening America's Schools, 2006*:

- A 3-4 student day per year improvement in attendance was documented for classrooms with natural lighting and improved indoor air quality.
- Students scored an average of 4% to 19% points higher than students learning in conventional classrooms.
- Green schools use on average 30-50% less energy and consume 32% less water
- Green schools cost less than 2% more than conventional schools, but provide financial benefits that are 20 times as large.

Consideration First

The benefits offered by greener schools are clear. So how does a school district go about designing and constructing them? Every school building has unique needs that require different design approaches and systems and layout considerations based upon the local climate conditions, the number of students and faculty, and the educational objectives of the district.

In addition, the entire building and the interaction of the various subsystems in the building including

the envelope (the roof, walls, windows and doors of a building), lighting, HVAC and water heating must be taken into account.

A key consideration in building green is matching specific technological solutions to specific challenges. The American Society of Heating, Refrigerating and Air Conditioning Engineers' (ASHRAE) Advanced Energy Design Guide for K-12 Buildings offers tailored solutions based on extensive experience and a collaborative effort with the U.S. Green Building Council (USGBC), American Institute of Architects (AIA), the Department of Energy (DOE), and other associations. The guide includes a set of common building subsystems. Download the guide free from www.ASHRAE.org.

The guide notes that in Missouri, as well throughout the nation, outdoor air for ventilation is a major contributor to energy use in schools. Therefore, exhaust air energy recovery or demand-controlled ventilation strategies are recommended in order to reduce energy consumption associated with meeting ventilation standards. This is typically best utilized in densely occupied areas with highly variable occupancy such as cafeterias, auditoriums, and conference rooms.

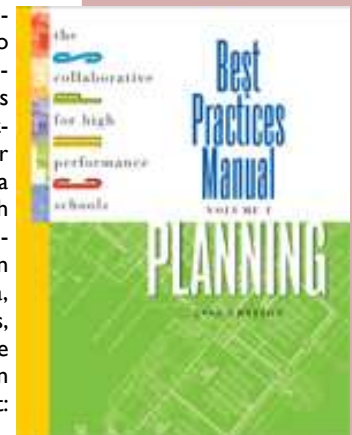
A key consideration in building green is matching specific technological solutions to specific challenges. For example, Upper Elementary School in Ozark, Missouri, utilized thermal storage technology and optimized its HVAC plant and controls to improve Indoor Air Quality and ventilation while also achieving compliance with new ASHRAE standards. Moreover, the proper implementation of the ice storage technology – along with other energy efficiency solutions – resulted in an impressive 16% reduction in energy costs. Another option for environmentally conscience school districts to consider is energy efficient geothermal heating and cooling systems.

How Green is Green?

There are two dominant green building rating systems to help school business officials answer this question. The USGBC recently

introduced LEED Version 3, also known as LEED 2009. LEED for Schools includes additional sections on master planning, classroom acoustics and mold prevention. There are four levels of compliance -- Certified, Silver, Gold and Platinum -- with different levels of activity and action required to achieve each.

The Collaborative for High Performance Schools (CHPS) began in California but is steadily being adopted in a number of other states across the country as a program referred to as CHPS National. The state-by-state approach allows states to customize the rating program to fit their unique needs. CHPS has a Best Practices manual, which consists of six volumes dealing with Planning, Design Guidelines, Rating Criteria, Maintenance and Operations, Commissioning. Find the guides and more information about the CHPS program at: <http://www.chps.net>



Conclusion

The solutions to deliver high performance schools that are environmentally responsible, have a reduced impact on the earth's resources, and are healthier and more comfortable for students and teachers are available today. We can integrate energy conservation and renewable energy strategies, high performance mechanical and lighting systems, water-efficient designs, environmentally responsive site planning, and environmentally preferred products to create High Performance schools that are both energy efficient and cost effective.

The public's desire and need for greener, more sustainable schools is clear. The benefits of building green schools are repeatedly being demonstrated in terms of operating cost savings, reduction in the use of natural resources, and performance and productivity gains by the occupants. It is simply the right thing to do. Laws and regulations are beginning to mandate these building practices and the construction industry is responding with some excellent guidelines and tools for executing green construction.

"High performance schools result in higher test scores, increased average daily attendance, increased teacher satisfaction and retention, and reduced environmental impacts."

District Priorities; Energy, Economy, Environment

By Keven Ward

It would be an understatement to say that School Districts throughout Missouri are confronted with a multitude of significant challenges. This article will focus on the interrelationship of three of them, **Energy**, **Economy**, and the learning **Environment** while providing timely advice to ensure Districts are prepared to implement optimal “green” high performance school improvements.

The objective here is to offer practical, multifaceted solutions without losing sight of the primary objective of education in order to provide Districts with the insight necessary to implement “green” high performance learning **Environment** improvements. These improvements are documented to enhance student academic performance by improving the health, safety, and attendance of students and staff, while reducing **Energy** usage and operational costs thereby improving the **Economy** of the District. Whether your District is rural, suburban, or urban the three **Es** of **Energy**, **Economy**, and learning **Environment** are very likely among the top priorities in your District.

Solutions that comprehensively impact **Energy**, **Economy**, and the learning **Environment** while optimizing the District’s budget are especially relevant in light of Missouri’s budget challenges and the impact on school finance. A short-sighted and narrow solution that reduces energy usage without improving the learning environment nor optimizing the economy of the District’s budget

would not only be less than optimal, but potentially damaging to the District as they face contemporary challenges the likes of which have not been addressed in many decades. A few snapshots of narrow, short sighted examples will suffice. It does the District little sustainable good to realize some short term energy savings by installing new building controls on old mechanical systems that have reached their end-of-useful-life, are near failure, and are genuinely in need of replacement with contemporary, high efficiency models.

Another short sighted example includes only upgrading the lighting systems while leaving the remainder of the aging mechanical infrastructure. In both cases the District spends precious capital outlay funds for the building controls or lighting systems, and realizes only a small fraction of the available savings a comprehensive project would provide without realizing the majority of the “green” high performance school improvement characteristics. Given that most Districts in Missouri have a significant backlog of capital projects to upgrade end-of-life systems it is essential that the District’s projects be comprehensively optimized for maximum impact on **Energy**, **Economy**, and learning **Environment**. Regardless of size, demographics, or location, Districts in Missouri are dependent on solutions that return the best bang for the buck, without the luxury of “do-overs”. Funding is too limited and the need too great for anything less than the best comprehensive “green” high perform-

ance school improvement projects.

If “green” high performance schools are the goal for your District, what are the practical financial paths available for your District to arrive there? In Missouri, like many states, a District has three primary options to fund capital projects, 1) capital outlay funds, 2) pass a bond, 3) statutory fiscal tools. Chances are that districts are well aware of the capital outlay and pass a bond options.

This brings us to exploring how best to utilize the *Missouri Statutory Fiscal Tool RSMO 8.231* option to enhance and/or accelerate the aforementioned financial options. *Statutory Fiscal Tool RSMO 8.231* is a powerful financial instrument advocated by the legislature, Governor, MO Department of Elementary and Secondary Education, MO Department of Natural Resources, MOASBO, MASA / MSBA, as well as the U.S. Department of Energy. When the fiscal tool is fully utilized public facilities in Missouri, including school Districts, can realize significant capital project advantages, sustainable “green” high performance learning environment improvements, positive public relations, and other fiscal benefits without being dependent on bond elections or depleting capital outlay fund balances.

The statutory fiscal tool provides a District with unique budgetary authority and advantages that enable the development, funding, and implementation of the comprehensive “green” high performance school improvements. These improvements optimally resolve the backlog of capital projects and result in sustainable reductions in **Energy** usage, **Economic** benefits for the District, and equally important learning **Environment** improvements.

Comprehensive fiscal tool projects start with 1) optimizing the facility envelopes, i.e. windows, doors, roofs, etc; 2) high efficiency lighting strategies, i.e. daylight harvesting, occupancy sensors, high output gym lighting, high efficiency classroom lighting, etc, 3) upgrade and/or replace aging HVAC systems to

optimize Indoor Air Quality (IAQ) while raising thermal and acoustic comfort, 4) install low flow water fixtures to conserve water usage and reduce sewage, 5) implement building control systems once lighting and HVAC infrastructure has been upgraded and replaced, 6) consider automated bus route optimization GIS software, 7) and finally, consider economically viable renewable energy solutions that are feasible for the geography and location.

The comprehensive projects enabled by the Missouri statutory fiscal tool provide the District with a broader range of improvements that result in reduced **Energy** usage, advantageous District **Economic** benefits, and sustainable learning **Environment** benefits that would otherwise be impossible without it. The statutory advantages include blending the energy and operational cost pay-backs to fall within the 15 year period the statute provides. The energy and operational cost reductions that result are reallocated to fund the project over time, making the timing of the project especially relevant in light of Missouri budget challenges and their impact on school finance.

An extended lease purchase term is enabled by the statutory fiscal tool. It provides a means for the District to fund the payments from the capital outlay fund with the option of leaving the utility and operational cost reductions in the District’s general operations fund or reallocating the savings to offset the lease purchase payment. This budgetary advantage is especially timely and advantageous at a time when Districts are contending with state aid cuts and developing strategies to mitigate the impact of the cuts on their District.

Missouri Educators have a well justified reputation for accomplishment and leadership demonstrated in good times and challenging times as well. The next few years will draw upon that leadership as Missouri Educators continue to optimally prepare the Districts they serve to advance education for the next generation and beyond.

To read an extended version visit: www.Trane-KansasCity.com
Click on “High Performance Schools”

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