

high performance school



Photos contributed by Heinz Rudolf of Boora Architects, Inc. courtesy of Michael Mathers for the Clackamas High School; and Dr. Rich Bauscher of the Middleton School District, Idaho.

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by Heidi Johnson-Wright

Green/sustainable school buildings create healthier students, happier parents and more attractive Smart Growth neighborhoods.

Students begin each school day by walking through a sun-dappled grove of trees, which gently shades the main entry way. They are drawn into a building that, instead of resembling a prison, is bathed in natural light streaming in from windows and skylights. From the dining area, students enjoy a breath-taking view of Mount Hood on the horizon. On the nearby grounds, six acres of carefully preserved wetlands are available as a learning lab. The students at Clackamas High School in Portland, Oregon, are immersed in the benefits of a high performance school.



"Schools are incredibly important places. Within them are invisible networks that determine whether students perform well or not. They are the backbone of society, an imprint for life. If they're not done well, there are serious consequences," said Heinz Rudolf, a principal with Boora Architects, Inc. of Portland, Oregon.

Rudolf should know. His firm prides itself on the design of schools—including Clackamas—using high performance principles, resulting in facilities that are cost effective, energy efficient, comfortable, sustainable and environmentally friendly.

Clackamas, opened in April 2002, aptly fits these criteria. It was built at a cost of just \$117 per square foot, as compared with typical high schools built at a cost of about \$135–145 per square foot. The school uses such things as day lighting, natural convection ventilation and impact-resistant, sound-absorbent materials to create a healthy, technologically-sustainable environment.

But the school is about more than just the bottom line. Clackamas is an inviting, aesthetically-pleasing place to be.

"When we design based on functionalism, we must make sure that every piece has a meaning, in a holistic way," Rudolf said.

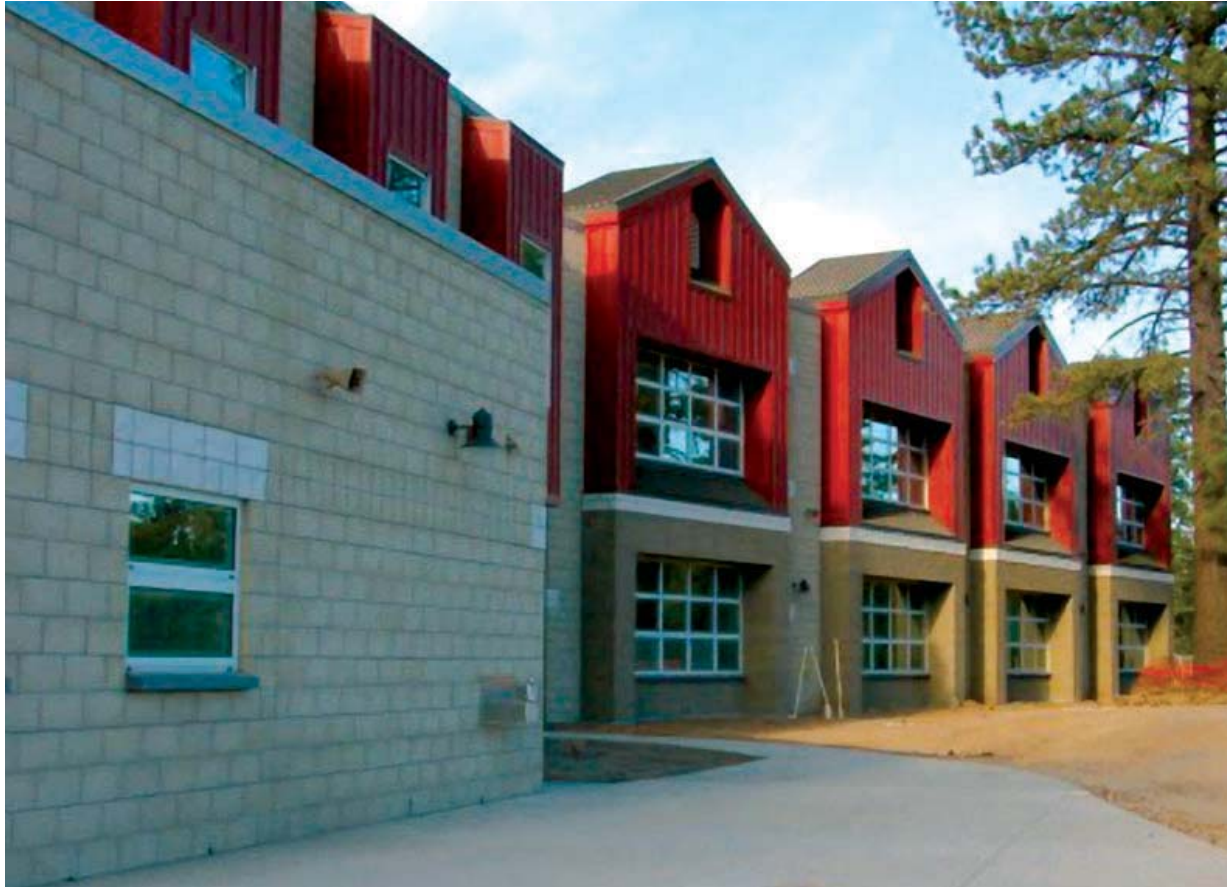
Clackamas is a good example of this. Its internal spaces are designed for both interaction and privacy.

"When you enter, the space is uplifting. It is day lit everywhere. Behavioral scientists and psychologists say that daylight influences one's ability to learn, it impacts test scores. Daylight is free and better than artificial light ... the windows connect people to the outside through beautiful views," said Rudolf.

"A school should be on the opposite end of the spectrum from a jail cell, which exists for punishment," he added.

Most people—parents, teachers, taxpayers and certainly students—would agree. But although the public may understand concepts of optimum form and function, the term "high performance" is still new to many.

"If you ask someone 'Do you want a high performance school?' They'll probably answer 'maybe,'" said Ted Bardacke, an Associate with Global Green USA, an environmental nonprofit organization headquartered in Los Angeles.



"But if you ask someone 'Do you want your kids educated in a school that provides natural daylight, reduces mold, saves money and protects the environment?' They'll answer 'Yes,'" he said.

Bardacke's hypothetical question neatly sums up many of the benefits associated with high performance schools. Such schools are part of a growing network of community-driven, voluntary partnerships that foster energy efficiency and conserve resources in commercial, government and public-housing buildings. They promote Smart Growth principles that draw people into communities to live and work.

These schools—some new builds, others retrofitted—conserve energy, save money, reduce pollution and help

revitalize aging cities and neighborhoods. High performance schools also help municipalities address whatever regional environmental problems they may be facing, such as water use, storm water management, air quality, recycling or mold problems. But the benefits go beyond increased dollars and decreased landfills. High performance schools can have a real impact on the education experience for the students who attend them.

Bardacke said that there are generally two things a school district wants.

"Good attendance, because in some instances funds get allocated to districts based upon average daily attendance, which is also often a good predictor of childhood health. And higher test scores. There are studies that show a correlation between high performance schools and test scores."

Bardacke underscores his point by citing a statistic from the U.S. Environmental Protection Agency that childhood asthma—a condition often associated with poor indoor environmental air quality—is the number one cause of school absenteeism linked to a chronic childhood condition.

It's not just student health at stake. Factor in faculty and administrative staff, and one in five Americans either works in or attends a school facility every day, for an average of six–eight hours daily.

Schools are the backbone of society, an imprint for life. If they're not done well, there are serious consequences.

Better learning environments mean a better educational experience, which also fuels urban revitalization.

"There is a high correlation between excellence in text scores and real estate values. Good schools raise property values," Bardacke said.

Consequently, more people are demanding high performance schools.

"It is overwhelmingly important to have a good learning environment for students," said Dr. Rich Bauscher, Superintendent of the Middleton School District in Middleton, Idaho.

"Parents tell us that their kids' attitude and desire to learn are attributable to the aspects of high performance schools."

For example, providing ample daylight enables students to see well. Avoiding dark, subdued areas and providing the right colors in the decorative scheme can have a significant effect upon students' moods and behavior.

"With the right lighting and colors, kids are less apt to be in bad moods and show disciplinary problems," said Bauscher, whose district's graffiti problem has been drastically reduced, thanks largely to high performance design.

Purple Sage Elementary School, which opened in fall 2003, is one of the Middleton District's shining examples of high performance principles at work. Natural light, plentiful windows, and light colors create a cheerful interior environment. Climate controls

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HIGH PERFORMANCE SCHOOL RESOURCES

Architects, engineers, educators and others interested in high performance design should visit the website for the Collaborative for High Performance Schools, which can be found at www.chps.net. The Collaborative's goal is to facilitate the design of high performance schools: environments that are not only energy efficient, but also healthy, comfortable, well lit, and contain the amenities needed for a quality education. There's no cost to become a CHPS school, and the program offers free training for project managers, engineers, architects, school district administrators and the general public.

Rebuild America is a growing network of community-driven voluntary partnerships that foster energy efficiency and renewable energy in commercial, government and public-housing buildings. At the federal level, it is the largest, most established technology deployment program within DOE's Office of Energy Efficiency and Renewable Energy (EERE). The program's goals are to: conserve energy, accelerate use of the best energy technologies, save money, reduce air pollution, lower

U.S. reliance on energy imports, help revitalize aging city and town neighborhoods, and create "smart energy" jobs. Visit the Rebuild America website at: www.rebuild.org

At www.hpschooldesigntraining.com, design and engineering professionals specializing in sustainable design for K-12 schools can take free on-line training on such topics as: lighting and electrical systems, daylighting and windows, mechanical and ventilation systems, water conservation, recycling systems, resource efficient building products and more.

Check out <http://www.epa.gov/iaq/schools/toolkit.html>, which features the U.S. Environmental Protection Agency's Indoor Air Quality Tools for Schools Kit. This free kit shows schools how to carry out a practical plan of action to improve indoor air problems at little or no cost using straightforward activities and in-house staff. The kit can be downloaded from the website or ordered by telephone at: 1-800-438-4318.

are electronic, delivering precisely comfortable temperatures.

"Restroom lighting is electronically controlled with sensors; it goes on when someone enters and goes off when they exit. The same is true for maintenance closets and storage areas, which is great for custodial personnel, who may have their arms full of supplies," explained Bauscher.

The school's toilets have automatic flushers. The sinks have automatic faucets which dispense water only when needed. Both decrease water waste and janitorial workload.

"We had an open house at Purple Sage, and the parents were ecstatic. They really appreciate this," said Bauscher, referring to the school's pro-student, environmentally-friendly features.

Anna Orrison, a parent of a first-grader at Purple Sage and a member of the district's Future Sites Committee, said that the quality of the Middleton schools played a major role in her family's choice of where to live. She is enthralled with the pleasant environment at Purple Sage.

"Different wings (of the school) use different colors. The color coding system is a simple and comforting system for young children. It makes it easy for them to find their classrooms. The school also has beautiful light and big rooms," said Orrison.

But it's not just new buildings in Middleton that have high performance aspects. The district has retrofitted some older buildings as well.

"Some of the older buildings used incandescent lights. These were all replaced with fluorescent lights that are energy efficient. The buildings have been repainted with lighter colors," said Bauscher, who pointed out that new lighting, painting and carpeting can be done relatively cheaply if a school district has relatively few dollars to work with.

Middleton is the fifth fastest growing district in the state of Idaho. As it expands by adding new facilities and expanding old ones, high performance concepts will remain a permanent part of the process.

Skeptics maintain that the approach adds red tape and delay to the creation of new facilities, a process already made cumbersome by funding and siting issues.

Good schools raise property values.

Bauscher acknowledges that the process is front-loaded in terms of effort, that such concepts must be incorporated from the very beginning. The traditional linear method of starting with the architect, then on to the engineer, then the contractor doesn't work. The process must be an integrated one from its inception. When done correctly, proponents say, the approach takes no longer from start to finish than the conventional method.

Bauscher maintains that the end result is worth it, given the benefits to students and the environment, as well as lower operating costs.

"If we create a school, it will be there for 75-100 years. Why not do it right from the start?" said Bauscher.



It's not just school administrators who can make high performance schools a reality. REALTORS® can play a role, too, by pushing for schools to be built with energy-efficient features, sustainable materials, day lighting and better indoor air quality. The result is better schools, cost savings to the district, healthier children, higher test scores and clients who want to buy homes in areas served by these schools.

Sherry Maupin, a REALTOR® with Woodhouse Group in Middleton, Idaho, and a Middleton school board member, urges other REALTORS® to get involved with their local school districts.

"Run for school board or at least attend their meetings. Become involved with PTA or PTO," said Maupin.

As a school board member, she is able to learn about what surrounding districts are doing and also about national academic statistics for schools. She stays involved with local developers to find out what they are doing within the community, and thus where expansion will occur.

"I also keep up with what's been approved by the local planning and zoning board," she said.

As a member of Middleton's Future Sites Committee, Maupin pushes for "forward thinking." When she joined the committee, she advised them to do a five-year and a 10-year plan. The committee studies things like areas of the community where there's population growth and areas where it's likely to occur, socio-economic demographics and lot sizes for planned developments—a good indicator of what type of housing will go up there.

"Usually the first question a REALTOR® is asked is: 'what are the schools like?'"

"Educate yourself on classroom sizes and teacher/student ratios. Get standardized testing scores for the district you're in and the surrounding districts. You should be able to get these from your state's department of education or the local district administrators," said Maupin.

"As REALTORS®, we sign a code of ethics that we are to strive to create better environments. What's more vital to this than schools? School systems are the hub of society."

Heidi Johnson-Wright frequently writes about Smart Growth and sustainable communities. She and her husband live in a restored historic home in the heart of Miami's Little Havana. Contact her at: hjohnson-wright@yahoo.com

WHAT IS A HIGH PERFORMANCE SCHOOL?

(As defined by the Collaborative for High Performance Schools)

- ✓ **HEALTHY** High indoor environmental quality is essential. The significant amount of time that students and teachers spend inside schools during the course of their educational career, combined with children's increased susceptibility to indoor pollutants underlines the importance of healthy schools.
- ✓ **COMFORTABLE** Comfort includes thermal, visual and acoustic comfort.
- ✓ **ENERGY EFFICIENT** Energy efficient schools save money while conserving nonrenewable energy resources and reducing atmospheric emissions.
- ✓ **MATERIAL EFFICIENT** To the maximum extent possible the school incorporates materials and products that are durable, nontoxic, derived from sustainable yield processes, high in recycled content and easily recycled themselves.
- ✓ **WATER EFFICIENT** High performance schools are designed to use water efficiently, saving money while reducing the depletion of aquifers and river systems.
- ✓ **EASY TO MAINTAIN AND OPERATE** Building systems are simple and easy to use. Teachers have control over the temperature and lighting in their classrooms, and are trained how to most effectively use them.
- ✓ **COMMISSIONING** Commissioning is the process of ensuring that building systems are designed, installed, functionally tested, and capable of being operated and maintained according to the schools' operational needs. Commissioning also can restore existing buildings to high productivity through renovation, upgrade and tune-up of existing systems. Overall, the school should operate the way it was designed to and should meet the needs of the owner.
- ✓ **ENVIRONMENTALLY RESPONSIVE SITE** To the extent possible, the school's site conserves existing natural areas and restores damaged ones, minimizes storm water runoff and controls erosion, and enhances the school building's high performance features.
- ✓ **A BUILDING THAT TEACHES** By incorporating important concepts such as energy, water, and material efficiency, schools can become tools to illustrate a wide spectrum of scientific, mathematical and social issues.
- ✓ **SAFE AND SECURE** Students and teachers feel safe anywhere in the building or on the grounds.
- ✓ **COMMUNITY RESOURCE** The most successful schools have a high level of parent and community involvement. This involvement can be enhanced if schools are designed to be used for neighborhood meetings and other community functions.
- ✓ **STIMULATING ARCHITECTURE** High performance schools should invoke a sense of pride and be considered a genuine asset for the community.
- ✓ **ADAPTABLE TO CHANGING NEEDS** High performance schools need to be able to embrace new technologies and respond to demographic and social changes.