

RENDERING: VMDO ARCHITECTS



Expected to become the first net-zero energy school in the Mid-Atlantic, Arlington Public Schools' Pre-K-5 Discovery Elementary School in Arlington, Va., by VMDO Architects has multiple learning environments outside of the classroom.

Building Type I - School Projects and Products

Earning High Marks

Energy-efficient LEED® schools foster new ways of learning and collaboration across the board

By Karin Tetlow

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rolling the
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Targeting Green, Health and Learning

Education has received unusual attention of late. There has been a growing effort to build schools that are green and safer from violent intruders as well as an awareness that design impacts students' health and performance. These concerns, plus an improving economy and a backlog of deferred maintenance, have translated into \$78.7 billion of school construction in 2014, the first year of no decline since 2008.

For nearly two decades, Ohio has had one of the most robust school building programs. In 2007, its Ohio Facilities Construction Commission (OFCC) required that K-12 school projects receiving state funding meet at least LEED® Silver certification and has projected that energy savings will double the initial expenditure on its LEED-certified schools in approximately 10 years.

Touchstone CPM, a construction, planning and management firm in Lima, Ohio, has managed 41 LEED school buildings that meet OFCC requirements. "What we're seeing is the private sector using LEED concepts and initiatives, but not spending the money to achieve LEED certification," says Touchstone President Nate Neuenschwander, CCM, LEED AP. "LEED innovations include efficient and automated LED lighting and ever more efficient mechanical and plumbing systems—for each new building there's a newer pump to use than was used on the last building." One key improvement is the increase in daylighting, long proven to enhance learning. In earlier decades, windows were deliberately sized small to lose less energy.

In addition to physical changes, school design is reflecting new ways of learning. Collaboration and team work rather than rote learning require flexibility and transparent spaces for all grade levels, such as the inclusion of extended learning areas (ELAs)—permanent, flexible areas that encourage collaboration.

Arlington Public Schools' Pre-K-5 Discovery Elementary School in Virginia (see cover) has multiple grade-level learning environments outside of the classroom that promote physical activity,



For the LEED® Gold Buckingham Primary and Elementary Schools in Dillwyn, Va., VMDO Architects incorporated research-based design features to address school-based obesity.

social engagement and experiential learning. These include occupiable reading nooks, outdoor labs, creativity walls, extensive environmental graphics and even an indoor slide. To be completed this year, the school is expected to

become the first net-zero energy school in the Mid-Atlantic and the largest in the U.S. VMDO Architects has included such energy-saving features as mechanical and lighting packages, a solar array and very high thermal insulation wall

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construction that have potential savings of \$52,000 in the first year and \$1.4 million over 20 years.

Another significant design strategy is the focus on healthy eating. The Buckingham County Primary and Elementary Schools in Dillwyn, Va., is one of the first schools to use its architectural design to address childhood obesity by teaching students to make healthy food choices. In collaboration with public health scientists Dr. Matthew Trowbridge, University of Virginia, and Dr. Terry Huang, School of Public Health, City University of New York, VMDO created "Healthy Eating Design Guidelines for School Architecture." Design strategies include wayfinding and classroom graphics, a teaching kitchen, food labs and kitchen gardens. Recent research, published in the *American Journal of Public Health*, found that students understood that graphics and messaging were designed to encourage physical activity and healthy food choices. ■

College Installs OSHA-Compliant Roof Edge Railing

A university located in Newark, Del., needed to retrofit a rooftop in order to comply with OSHA standard 1910.66(e)(3) requiring a perimeter guarding system for employees working on the roof. The non-compliant parapets were not at least 42 in. high.

The institution installed a KeeGuard roof edge railing system that meets the OSHA requirement for height as well as OSHA standard 1910.23(e)(5)(iv) of being able to withstand a load of at least 200 lb applied in any direction.

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By installing an OSHA-compliant perimeter guardrail system, the university now provides collective protection for maintenance and repair personnel working on the roof. ■

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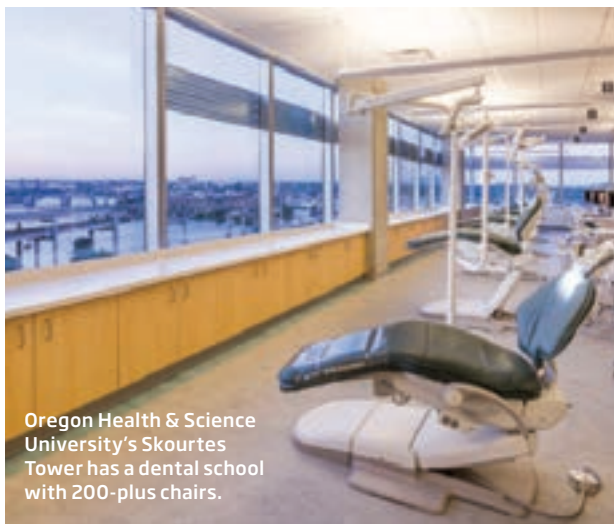


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Collaborative Facility Changes How Medical Students Learn

The Oregon Health & Science University's Skourtes Tower and Life Sciences Building in Portland, Ore., brings together nursing, pharmacy, dental and medical students and researchers to learn and work as teams. The 650,000-sq-ft LEED® Platinum building was designed to encourage interaction, reflecting a new approach to healthcare education. The building includes a dental school with 12 operator rooms; medical simulation floors with exam rooms, labor and delivery, and critical skills rooms; and biomedical and chemistry research and graduate labs.



Oregon Health & Science University's Skourtes Tower has a dental school with 200-plus chairs.

\$30-million contract included electrical power and distribution, audio/video systems, and voice/data, fire alarms and security systems for the entire building.

While the facility emphasizes collaboration among the disciplines, construction involved collaboration between multiple owners, including OHSU, Oregon University System and Portland State University. "Working with multiple owners on this unique project made it extraordinarily challenging to incorporate all the stakeholders' needs,"

says Clint Valiton, Oregon Electric Group vice president of preconstruction. "The success of this project is directly related to the collaborative spirit and approach of the entire team." ■

MDU Construction Services Group is part of the MDU Resources Group, Inc. family of companies (NYSE: MDU).

Oregon Electric Group, an MDU Construction Services Group company located in Portland, was the electrical subcontractor on the job from groundbreaking in December 2011 through completion in July 2014. The company's

PHOTO: MDU



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Rapid-Drying Concrete Speeds Schedule

When the Dallas Independent School District embarked on the \$36-million replacement of the Billy Earl Dade Middle School, the original schedule was 14 months. But the district requested a shorter time frame to coincide with the fall 2013 school opening.

To meet the schedule, ARIDUS Rapid-Drying Concrete was selected. The scientifically engineered concrete consumes excess water, thereby accelerating the concrete drying time and eliminating moisture-related environmental hazards. "It typically will take anywhere between four to eight months to get below 80% relative humidity inside your concrete," says Jim Hagemann, construction manager with Satterfield & Pontikes Construction Inc., the general contractor. "With ARIDUS we achieved this in 21 days, giving us the option to install flooring significantly sooner, which is phenomenal."

The concrete reached full strengths within 48 to 72 hours. This allowed the team to accelerate the initiation of the next steps—stripping the form work, removing the shoring, putting in the re-shores, and providing mechanical, electrical and plumbing in overhead spaces on the floor below. Within three days, 5,000 psi was achieved. Out of a total of 20,000 cu yd of concrete, 5,000 cu yd of ARIDUS Rapid-Drying Concrete covered 120,000 sq ft of floor.



Helped by ARIDUS® Rapid-Drying Concrete, the energy-efficient Billy Earl Dade Middle School in Dallas was completed ahead of schedule.

The famous Gee's Bend quilting collective was the inspiration for the school and the geometric composition on the façade. The patterns on the curtain wall represent a quilt, weaving the students and the community together into shared stories that will be told for generations. The 213,000-sq-ft building features three floors with classrooms canted along the corridor to allow for bonus educational spaces. The facility uses geothermal energy for heating and cooling, supplied from hundreds of wells on the site. ■

PHOTO: CHRIS COOPER

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