CASE STUDY

EDUCATIONAL CAMPUS FACILITIES

MBMA
METAL BUILDING MANUFACTURERS ASSOCIATION®
Research | Leadership | Education

No Boundaries:

21st Century Education Shifts Paradigms in Design and Construction

Designing educational campus facilities and their support buildings has changed dramatically and continues to evolve to meet new instructional paradigms and the demands related to the explosive evolution of technology tools.

Consider these realities:

STEM Gains STEAM

Science, technology, engineering and math (STEM) programs have never been in greater demand than in our 21st century classrooms. Now, its sister concept adds arts to the equation, making STEAM a prominent player in K-12 curricula. These leveraged-learning concepts require rethinking how spaces are structured. The ability to complete group projects, access research online, conduct experiments and explore artistic expression—all in the same space—calls for classrooms that are completely flexible. Work tables, seating, equipment, electronics, whiteboards, wall-mounted monitors and privacy are all considerations when creating a space that makes sense for multifaceted education. Metal buildings are a logical choice for such dynamic learning environments because walls and rooms are easily reconfigured to accommodate changes in needs and allow for open and flexible configurations.

The Value of Venting

Proper ventilation in educational facilities is more important than ever in our post-pandemic world. Proper airflow through HVAC systems and efficient filtering can be enhanced through the use of operable windows. In metal buildings, the open and flexible room configurations allow for the free flow of conditioned air as well as ease the installation of windows, which can reduce energy and bring fresh air and breezes into a classroom.

Daylight Brings Sunlight

Natural light in the classroom has long been shown to improve student performance and increase alertness and energy. Not only do operable windows bring value, but skylights also add to the visual vibrancy of the learning environment. Metal roofs are an ideal platform for skylighting and provide a number of advantages. In a Metal Construction News magazine article titled “New Era for Skylights,” Brian Grohe, LEED AP explains that “skylights are great options to make spaces healthier, more energy efficient and reduce electricity costs. A properly installed skylight makes buildings greener and reduces their carbon footprint … New and retrofit skylights on metal roofs offer time-efficient installations, energy efficiency and, most importantly, durability and peace of mind.”

Aiken Technical College Center for Energy and Advanced Manufacturing
Graniteville, SC

Niagara University Clet Hall
Niagara University, NY

Architect: BHNT Architects
Builder: Tedesco Construction Services

Break Up and Break Out

You'll have to look in the rearview mirror to see classrooms with 25 desks lined up in neat rows of five where students wrote notes on lined paper as teachers filled whiteboards with daily lesson activities.

Today, students are given more resources to work independently, in groups and in partnerships. Teachers become catalysts for self-directed and online learning. One student may be learning how to conduct a science experiment via YouTube while a team of five huddles in a corner designing a flowchart to figure out how to best complete a process. Rooms must be full of alternative spaces—and with lots of hard surfaces for electronic devices and plenty of power sources and outlets to charge them. Space becomes fluid to meet the needs of the moment and the needs of the evolving curricula. Whether in grade school or grad school, students need adaptable environments and, according to Tony Bouquot, the general manager of MBMA, metal buildings excel in that criterion. "Rooms divide easily; expansion is as simple as removing one wall," he says. "Electrical conduits are built into the fabric of the design. In addition, the need for interior support walls is nonexistent as clearspan structures are the hallmark of metal building construction."

Architect: McMillan Pazdan Smith Architecture, LLC
Builder: RW Allen Construction

Get Outside and Learn

Outdoor education spaces are becoming more popular as well. This is in part because, during the COVID-19 pandemic, some schools adapted by offering outdoor classrooms; but outdoor learning had already been gaining ground, as more science curricula has led teachers to invite hands-on learning. Creating cost-effective outdoor learning spaces that provide cover during inclement weather, appropriate electrical connections and flexible floor plans are all achievable using metal building components. Overhead doors allow the spaces to be open to the elements or closed to keep bad weather at bay.

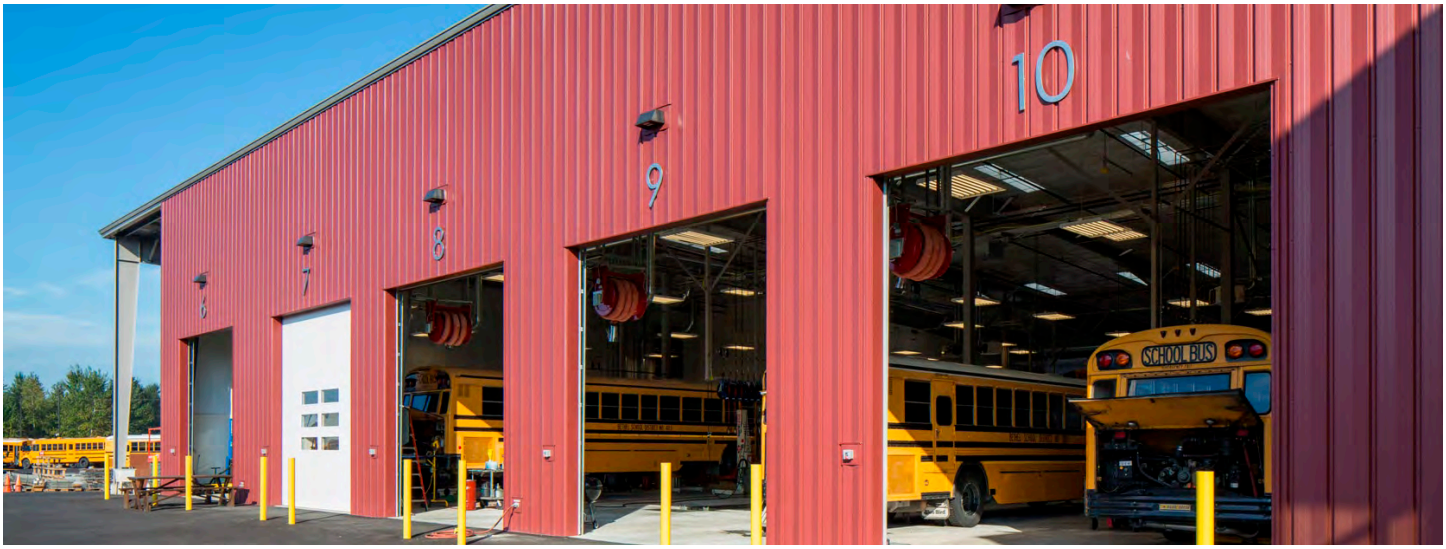
Get Ready to Grow

Schools inevitably need room to grow. With metal buildings, expansion typically involves the simple removal of an endwall or sidewall, erection of additional structural frames, and matching the existing wall and roof coverings to the addition. This flexibility naturally cuts costs and reduces the time and inconvenience typically required to expand or add to an existing structure.

Transportation Center and Central Kitchen

Bethel School District

Spanaway, Washington



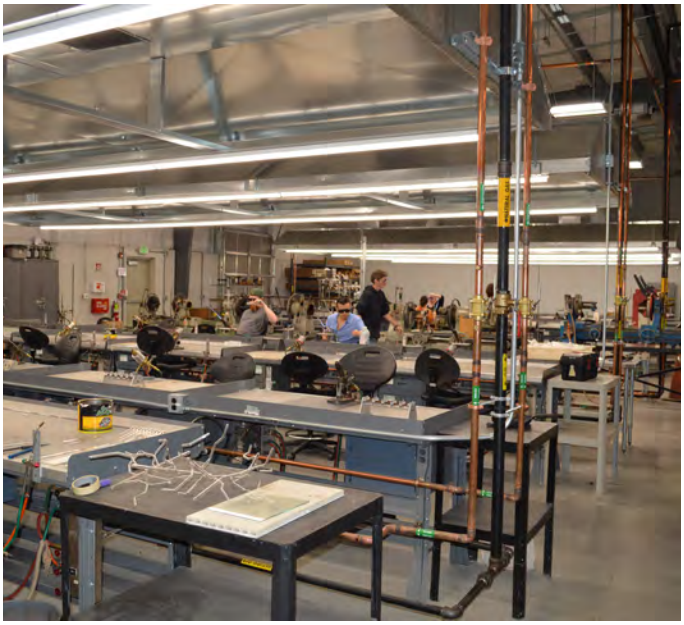
Architect: Bassetti Architects
Builder: BNBuilders

This 65,000-square-foot, two-building complex includes a transportation center with six bus maintenance bays and a bus wash, lube room, training facilities, bus driver lounge, offices and classrooms. The second building is a central kitchen capable of producing up to 10,000 meals per day and serves the district's 23 schools. According to Bassetti Architects' website, these metal buildings are "augmented by a masonry wainscot and sun-shading devices to add durability, increase function and enhance visual interest." The project received two awards from ENR Northwest—Best Project in Government/ Public Building and Excellence in Safety—and a Best of Category award from Metal Architecture magazine.

Samuel and Jean Jones Glass Education Center

Salem Community College

Carneys Point, New Jersey



Design and Construction: TriMark Building Contractors/BlueScope Construction

The Samuel and Jean Jones Glass Education Center is home to a variety of studios and workshops that allow students to work toward associate degrees in scientific glass technology or glass art. The wide-open workspaces inherent in metal building design are ideal for glass production activities. The 20,000-square-foot building includes two flameworking studios, 20 student workspaces and instructional areas in each studio. The hot shop has four glass-blowing benches and there are also coldworking and kiln areas, storage and workspaces. The fabrication studio houses metal and working equipment and a 289-square-foot gallery where students display their work. The pre-design charrette involved all stakeholders, including the mayor of Salem and building code officials who were instrumental in approving the special requirements for this unique educational space.

St. Joe's Mercy Elite Sports Center

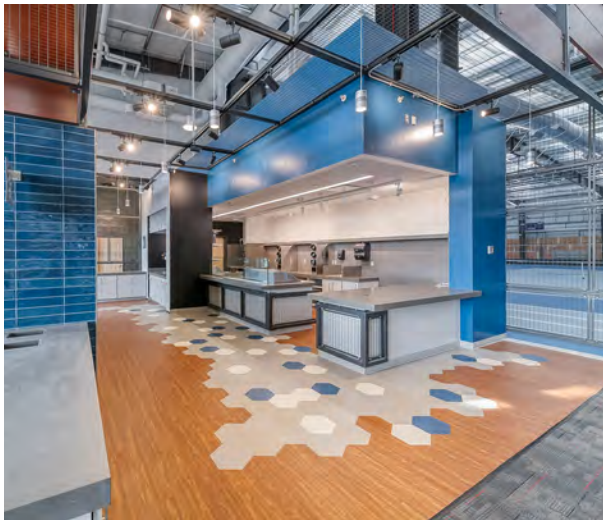
Schoolcraft College

Livonia, Michigan

Architect: Integrated Design Solutions

Builder: Engineered Buildings, Inc./BlueScope Construction

The St. Joe's Mercy Elite Sports Center is a partnership between St. Joe's Health, Mercy Elite Sports Performance and Schoolcraft College. It is a training center for the Michigan Wolves-Hawks soccer club and is the western suburban home for the Michigan Elite Volleyball Academy. The building includes eight volleyball courts, a running track, soccer training facilities and fitness and rehabilitation areas. It also houses a fitness laboratory, classrooms and faculty offices to support the college's associate degree program in fitness leadership. The 74,000-square-foot multipurpose facility was under construction when the COVID-19 pandemic hit; but, despite pandemic protocols, construction of the building shell was completed in just five months.



Arcanum-Butler Local Schools

Multipurpose Building

Arcanum, Ohio

Architect: Garmann/Miller

Builder: H.A. Dorsten

This facility is a custom-engineered metal building system incorporating metal wall and ceiling panels and a metal roof. The building, approximately 21,000 square feet, attaches to an existing 147,785-square-foot school by a 50-foot connector. The multipurpose structure features a training room with rubber athletic and synthetic turf flooring and two retractable batting cages. It also includes a vocational/agricultural area that provides specialized instructional spaces, such as a greenhouse and multiple welding booths.

Camp Trivera STEM Center

Girl Scouts of W. Oklahoma

Oklahoma City, Oklahoma

Architect: REES

Builder: Rigid Steel Structures

The STEM camp's main building is a two-story lodge with teaching areas, a training kitchen, and event and group space, as well as a covered outdoor learning area. According to REES' website, "Tent shaped details on the building's exterior minimize direct sunlight and create a classic camping emblem." The design team was recognized with various awards including the Philanthropic Vision award from ULI Oklahoma, the Educational Building of the Year award from Chief Buildings and the People's Choice award in Urban Design from AIA Central Oklahoma.

Central Kitchen

Boulder Valley School District

Boulder, Colorado

Architect: Stantec

Builder: Maverick Steel, Inc.

This 33,000-square-foot, $17 million central kitchen replaced the school district's regional production kitchens, streamlining production and efficiency. The facility includes a 27,000-square-foot metal building plus 6,000 square feet of connected refrigerated and dry storage space. All areas are temperature-controlled for food safety. Large bays accommodate commercial delivery trucks and a smaller bay serves the trucks of local farmers who provide seasonal produce.

Cole Academy East Charter School

Chartered by Central Michigan University

East Lansing, Michigan

Architect: Jeffrey Parker Architects

Builder: Granger Construction

This 23,000-square-foot elementary school was built to grow. Initially serving kindergarten through second grade students, the metal building design accommodates easy expansion. The goal is to add one grade per year over a six-year period, topping out with eighth grade and a student population exceeding 600.

Poplar Hall Agriculture Center for Innovation

Morgan Community College

Fort Morgan, Colorado

Architect: CannonDesign

Builder: Pro-Steel, Inc.

It may be small in size, but its value is huge. Poplar is just under 5,000 square feet, but the $1.9 million facility is recognized as a cutting-edge technology resource for those studying precision agriculture and agriculture business management. Kari Linker, the former director of development with the Morgan Community College (MCC) Foundation, had this to say at the opening of the hall: “This beautiful building and investment made by MCC is a true tribute to our agriculture industry which drives our regional economy.”

Agriculture Stewardship Center

Dordt University

Sioux Center, Iowa

Architect: CannonDesign

Builder: Bouma & Company, Inc.

The Dordt University Agriculture Stewardship Center is touted as a place that facilitates 21st century learning in agriculture and manufacturing. The facility spans over 26,000 square feet and is anchored by a large gathering area capable of hosting 150 people. The building has three classrooms, a manufacturing lab, and a high-bay space where students can learn to repair and maintain farm equipment. At the groundbreaking ceremony, Howard Wilson, the school's chief administrative officer, commented, "We hope the new Ag Stewardship Center will be a creative space for our students to experience hands-on learning as well as a center for agricultural excellence in Northwest Iowa and a convening space for agriculture leaders."

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>
> Howard Wilson
> Chief Administrative Officer

Kelly Family Sports Center

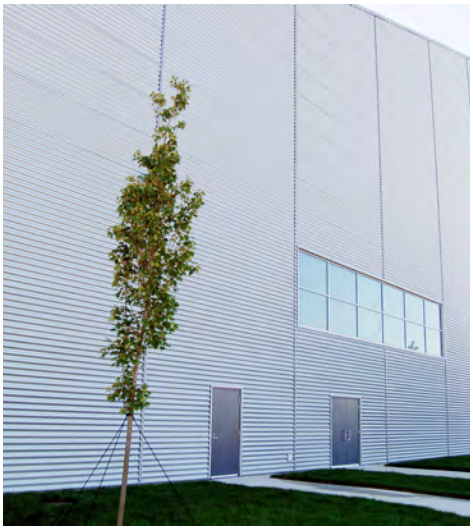
Grand Valley State University

Allendale, Michigan

Architect: Integrated Architecture

Builder: Erhardt Construction Company

This 138,000-square-foot LEED Gold-certified facility includes a regulation football field, a six-lane, 300-meter track and batting cages that drop down from the ceiling. Bleachers seat over 1,000 spectators. The Kelly Family Sports Center also houses classrooms and multipurpose rooms, an athletic training facility and lockers. The building serves the Movement Sciences department, intercollegiate sports, recreational sports and intramurals.



Carol Soffer Indoor Practice Facility

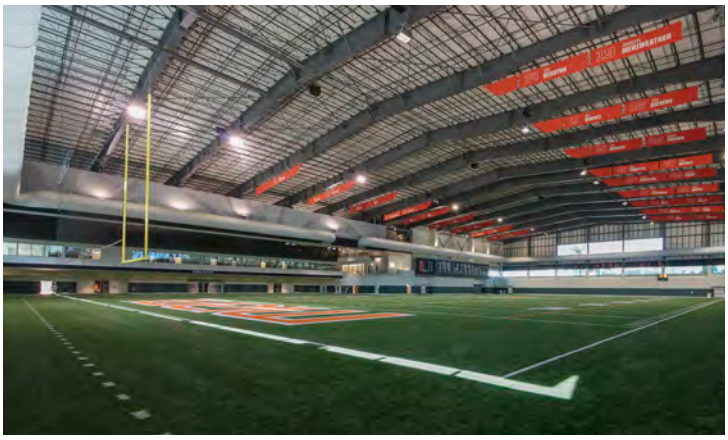
University of Miami

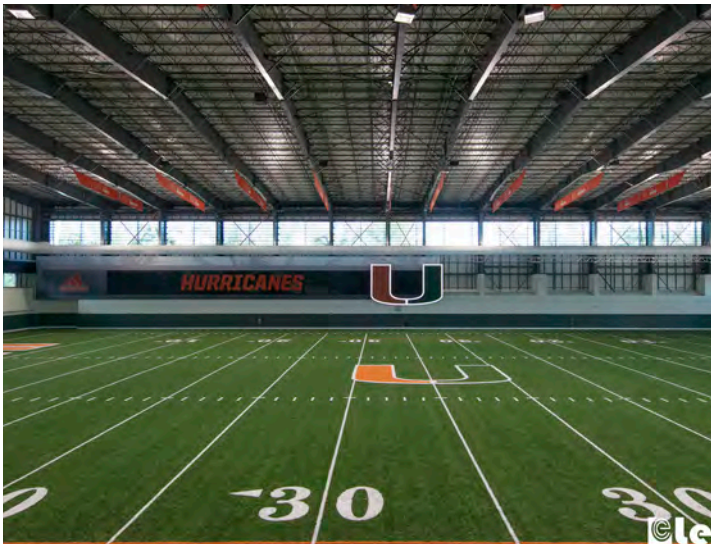
Miami, Florida

Architect: AECOM

Builder: Lemartec

The $34 million, 83,000-square-foot indoor practice facility, constructed in just 14 months, provides practice fields and training areas, football meeting facilities, a weight room and a sports nutrition area as well as offices for coaches, recruiting suites and team film rooms. Located in the heart of the university's athletics complex, the design aesthetic makes the Carol Soffer Indoor Practice Facility a centerpiece.





Thogmorton Center for Allied Health

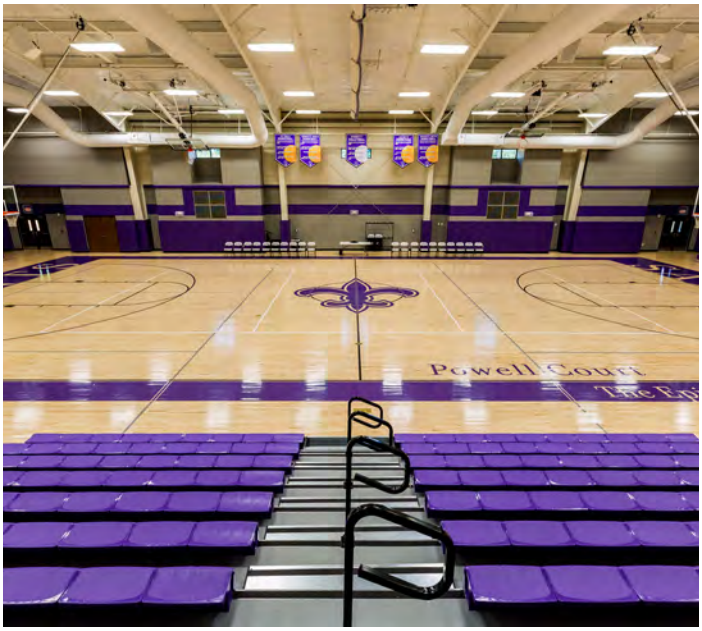
Central Methodist University

Fayette, Missouri

Architect: PWArchitects, Inc.

Builder: Coil Construction

This 25,000-plus-square-foot facility provides classrooms and labs for training health professionals. It includes occupational and physical therapy classrooms as well as athletic training spaces. The building is designed for flexible use, including removable walls and partitions, and also has open conference and collaboration spaces. Simulation labs provide patient rooms surrounding a nurses' station, a control room for video and observation activities, several debriefing and conference rooms and patient exam rooms. A geothermal heating and cooling system reduces energy consumption.



Siler Athletic Center

Episcopal School of Knoxville

Knoxville, Tennessee

Architect: BarberMcMurry Architects

Builder: George W. Reagan Company

A new gymnasium was created to support the ongoing enhancements to this private school campus. The gym is nearly 20,000 square feet and it combines metal building system components (clear span main frames and a mechanically seamed metal roof) with wood roof trusses and framing. The building can accommodate 1,000 people and includes basketball-volleyball courts, four classrooms and a music room. To coordinate with the exterior palate of the existing campus, brick, split-faced concrete masonry and EIFS were incorporated into the design.

Ed & Myrtle Lou Swindle Agriculture Complex

Warner University

Lake Wales, Florida

Architect: Johnson Cartwright Jarman Architects, P.A.

Builder: Canco General Contractors

Warner University's LEED Silver agricultural facility uses wind turbines and solar panels to conserve energy and it employs a rainwater collection system for irrigation. The $2 million, 18,000-square-foot structure includes an administration building that serves as the welcome center for prospective students and agricultural community events. It is the connector for all agriculture complex activities and houses faculty offices, a conference room, a work room and a reception area.

Windsor High School Farm
Isle of Wight County Schools
Wight County, Virginia

Architect: RRMM Architects
Builder: Blueridge General

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