

CASE STUDY

EDUCATIONAL CAMPUS FACILITIES

MBMA

METAL BUILDING MANUFACTURERS ASSOCIATION®
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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 spaces.

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 and for the efficient

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



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

footprint ... New and retrofit skylights on metal roofs offer time-efficient installations, energy efficiency and, most importantly, durability and peace of mind.”

Break Up and Break Out

Niagara University Clet Hall
Niagara University, NY

Architect: BHNT Architects
Builder: Tedesco Construction Services



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

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."

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.



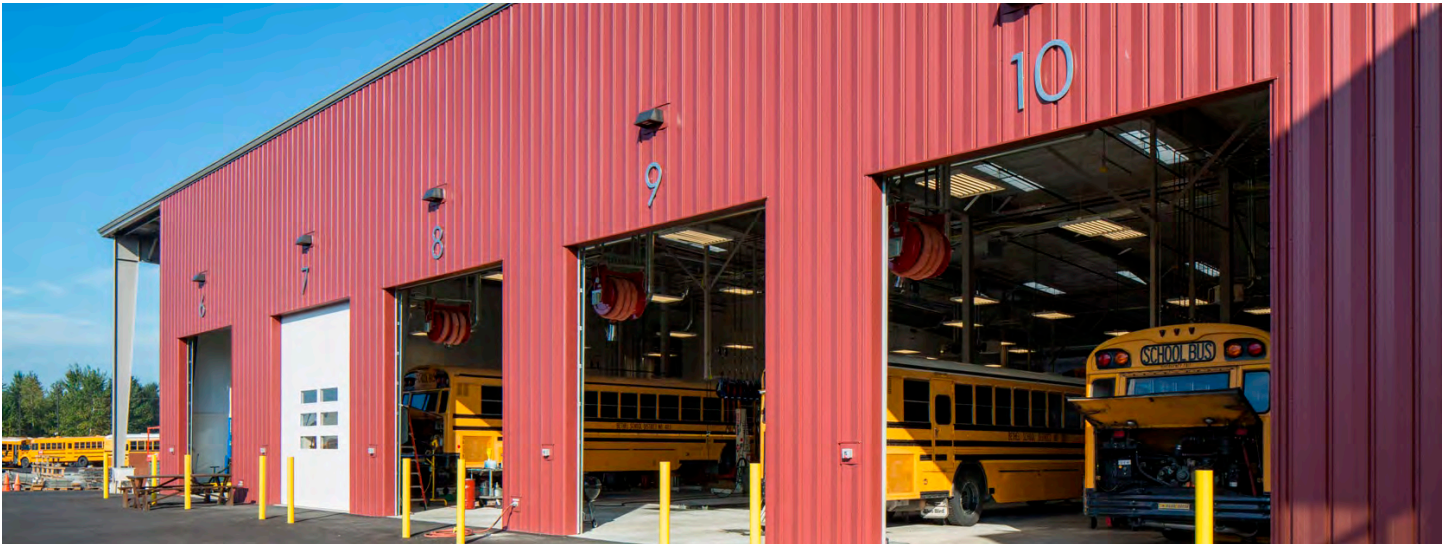
Architect: McMillan Pazdan Smith Architecture, LLC
Builder: RW Allen Construction

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

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 frameworking 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

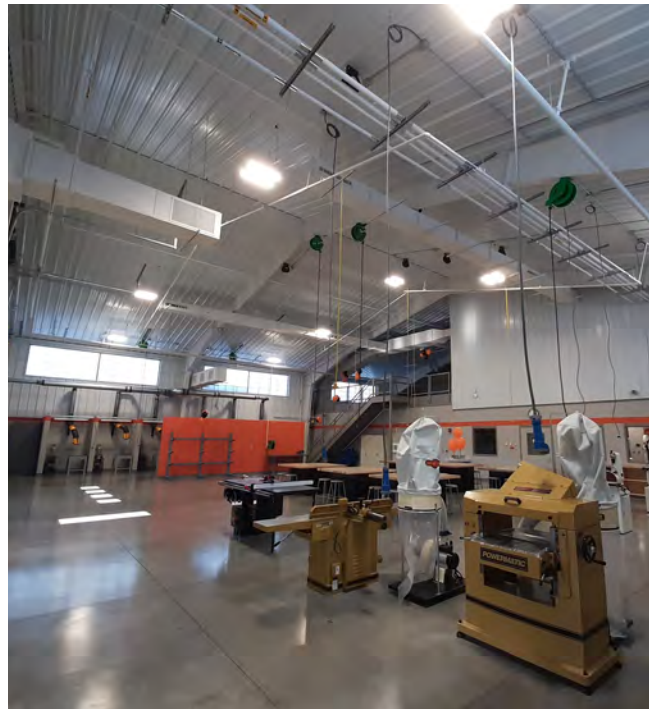
Arcanum, Ohio



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."

"We hope the new Ag Stewardship Center will be a creative space for our students to experience hands-on learning."

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

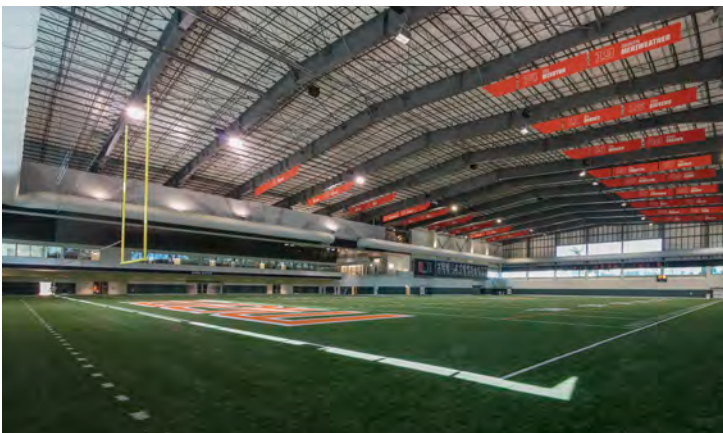
Miami, Florida



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.



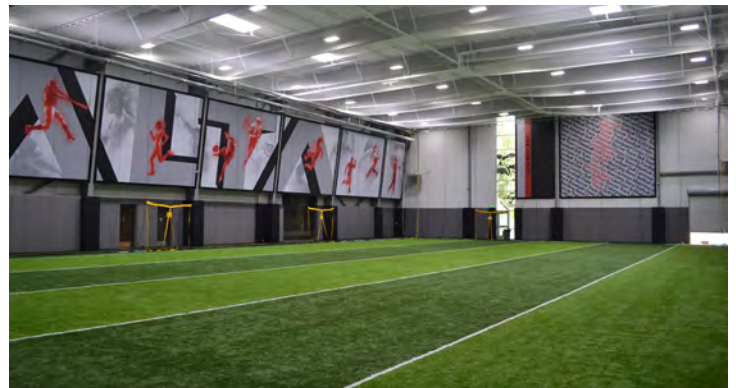


Sports Practice Facility Alta High School

Sandy, Utah

Architect: VCBO Architecture

Builder: A.D. Constructors, Inc.



The Canyons School District in Sandy, Utah, decided to update Alta High School's 40-year-old building. Rather than tearing down the outdated facility and replacing it, the school board opted to refurbish and modernize the existing building and add a few additional structures to the campus. This avoided the disruption of classes for its over 2,000-member student body.

One of the additional buildings is a 20,350-square-foot indoor sports practice facility. This permits the Alta High School athletic teams to participate year-round in sports such as baseball, softball, soccer, lacrosse, tennis and more. As a 5A school with a long tradition of state championships, Alta offers sports at sophomore, junior varsity and varsity levels. With this facility, inclement weather does not pose a negative impact on the practice schedules for both the Hawks and the Lady Hawks.

VCBO Architecture designed the building, which features rigid frame and lean-to clear span framing. The outside is clad with American Building Company's Architectural III wall panel system and a massive custom vinyl graphic of a hawk. VCBO selected bold and bright finishes that are also hard-wearing to address the high-activity environment. A mezzanine area cantilevers several feet from the structure. Guests can watch the field events from an observation room with large windows that look down on a 50-by-30-yard artificial turf practice field. The design includes a suspended batting cage that can be lowered as needed, upstairs meeting rooms, a referee room and concession stands.

Hughes General Contractors managed the construction and A.D. Constructors/SPR Steel Erectors completed the building erection process.



School of Chiropractic Campbellsville University

Harrodsburg, Kentucky

Architect: David C. Hennen

Builder: Hilpp Construction, Inc.



The Campbellsville University School of Chiropractic in Harrodsburg, Kentucky, is the first of its kind in the state and the only school of chiropractic within a 300-mile radius. Currently, there are 18 chiropractic institutions in the United States. Only four of those are university affiliated. The School of Chiropractic is the eighth school in the Campbellsville University system, which has locations throughout Kentucky, California and soon Canada.

Architect David C. Hennen designed the 40,706-square-foot building to match the university's neo-classical campus model. With elements blending traditional and modern, the design reflects the professional perception of the chiropractic academic program.

The building's traditional brick exterior is accented with 20-foot-tall columns standing on either side of its entry portico. Inside, a partial mezzanine

maximizes the space and creates a large open atrium that features steel and glass railings combined with accents of stained cherry wood. The common area created by the atrium provides a gathering space and a coffee shop. To increase energy efficiency, LED lighting was installed throughout the two-story structure's office areas and classrooms.

Costing just under \$5 million, the metal building system sports a standing seam metal roof system, incorporates 6-inch vinyl back insulation with thermal blocks, and has an eave height of 30 feet. The wall system is composed of metal studs with masonry veneer and includes a custom steel canopy.

The building was completed in conjunction with a new city street that connects the new structure to other school facilities and provides easy access to U.S. 127.

Basketball Performance Center

Jacksonville University

Jacksonville, Florida

Architect: Quinn Evans

Builder: Balfour Beatty

The Jacksonville University's (JU) Basketball Performance Center in Jacksonville, Florida, is a dream come true for coaches and students alike. They now have a prestigious building dedicated to basketball only—an uncommon occurrence around the country and unique to their league. They no longer share Swisher Gym with volleyball wrangling for practice time and space. All 18,000 square feet of this state-of-the-art facility belongs to the men's and women's basketball teams alone. The ASPIRE campaign, the largest fundraiser in the university's history, provided funding for the \$8 million facility.

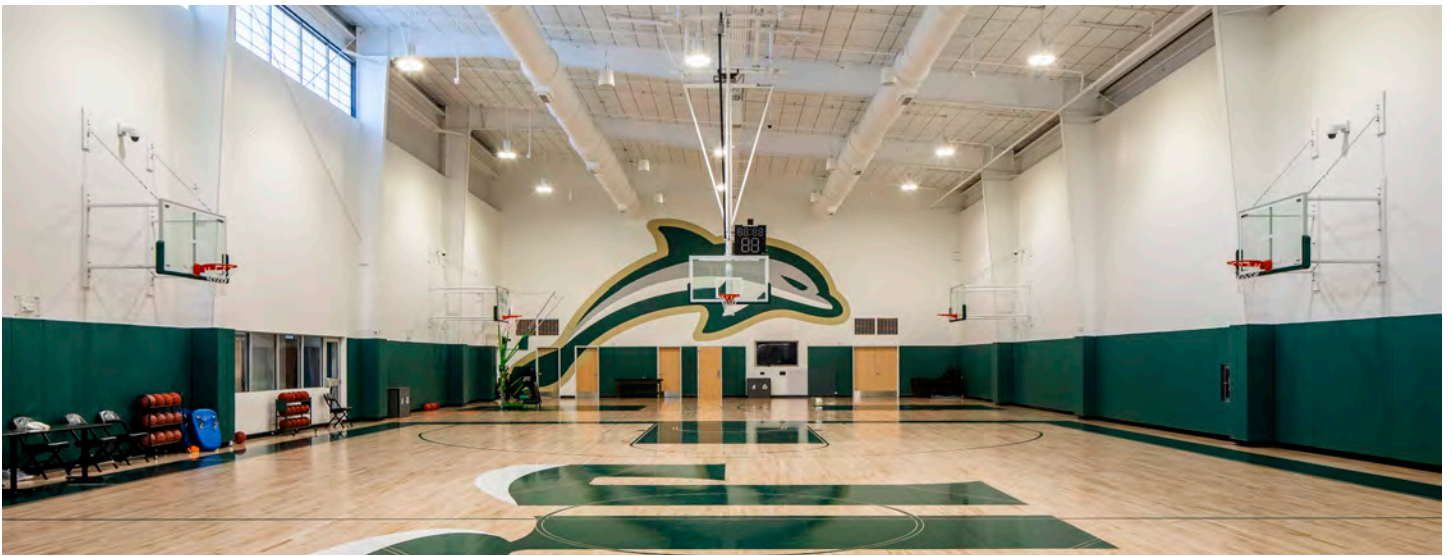
Televisions positioned alongside of the courts broadcast practice footage taken by cameras installed around the room. Teams and coaches can review the film in real time. Bluetooth-enabled speakers allow athletes to listen to their own music during training and practice, while sound-proofed offices keep any noise from distracting coaches at work or in meetings.

With staff offices, a half court and a full court, the Dolphins have everything necessary to focus on the skills needed to succeed in basketball and further develop their talent. A weight room adjacent to the practice floor encourages daily use for performance improvement and injury prevention. With 24-hour access, players can feel at home at the center. While helping the teams take the program to the next level, the facility provides an added attraction when recruiting athletes.

“A centrally-located facility impacts our programs’ culture tremendously,” said Darnell Haney, JU women’s basketball head coach. “A one-stop shop where we can train, build team camaraderie, and attract top recruits helps us compete at a high level and carry out the mission of our program. It is our program’s goal to positively impact the lives of our student-athletes, the JU community, and the city of Jacksonville through winning basketball and quality education.”

Quinn Evans designed the two-story building. The facade features architectural elements including a variety of metal panels. These standard metal panels lay both horizontally and vertically, which creates visual interest and minimizes the building’s mass. The bronze framing on the front side of the building was created by stacking two 2.5-inch insulated metal panels on top of each other, achieving a dramatic transitional look without the added cost of customized pieces.

Standard metal panels were used on the north and south sides of the building and vary in type and thickness—from 1.25 to 2 inches. The north side of the building, for example, features an R panel, reverse R panel and a flat soffit panel. In total, seven panel types were used. Harrell Construction Co., Inc. completed the building erection.



Administration Building

City View Independent School District

Wichita Falls, Texas

Architect: HPA, Inc.

Builder: M & F Litteken Co.



The Mustangs of the City View Independent School District in Wichita Falls, Texas, recently added a new administration building. It features a metal building system with a combination of Moderra mortarless masonry veneer and EIFS walls. The attractive main entrance provides a gabled portico and each side entrance includes a cantilevered canopy. A standing seam metal roof tops the facility.

The architect, HPA, Inc., designed the building to facilitate the administration of City View ISD's two campuses. One includes a Headstart program through the 5th grade. The other holds grades six through 12. Districtwide there are a little over 1,000 students.

Starting in the 5th grade each student receives a Chromebook for home use. When they graduate, the Chromebook is theirs to keep. For those



who are college bound, the district offers dual-credit courses free of charge through Midwestern State University (MSU) in Wichita Falls, Texas. Students interested in entering career and technical education programs may choose from several options such as Animal Science, Applied Agricultural Engineering, Business Management, Culinary Arts, Environmental and Natural Resources, Law Enforcement, Nursing Science or Plant Science.

Overflow Building System Middlebury College

Middlebury, Vermont

Architect: McLeod Kredell Architects

Builder: Naylor & Breen Builders, Inc.



Middlebury College offers 44 majors to its nearly 3,000 undergraduate students enrolled from all over the United States and 74 other countries. It offers graduate schools and international programs as well.

A problem was developing when the computer science department began running out of space. McLeod Kredell Architects designed an overflow building solution to meet the evolving needs of the expanding science program as well as any other department that might face a similar growth spurt. The new structure offers flexible swing space to provide for displaced departments during planned renovations of existing buildings.

The facility serves as a permanent solution to the need for additional space, but it was built on a temporary building budget. The cost of the 22,036-square-foot metal building was just under \$650,000. The design includes a standing seam metal roof and the walls sport both vertical and horizontal siding. Creative design elements include a playful arrangement of windows and doors on the elevation of the structure. Aesthetically, the metal building blends in with the community and large windows offer occupants striking panoramic views of the 350-acre campus. It sits close to the core of the campus so that occupants feel like an integral part of the educational complex even though they are in an overflow space.

Melissa Championship Center

Melissa Independent School District

Melissa, Texas



Architect: Parkhill, Smith & Cooper, Inc.

Builder: Harrison, Walker & Harper

The Melissa Championship Center is an impressive addition to the Melissa High School campus. At 134,200 square feet, it is the largest sports facility of its kind in Texas—larger than the facilities at the Ford Center at The Star in Frisco, and at universities such as Texas A&M and University of Texas at Austin. It is certified as a college-level center by the University Interscholastic League.

Architect Parkhill, Smith & Cooper, Inc. designed the 200-foot-wide and 40-foot-high hybrid metal building system, which incorporates a 24-inch standing seam roof and an R-30 double-layer liner system. The walls are insulated metal panels with an embossed finish. Bump-outs around all the outside columns add a distinctive look. Much of the structural steel portion is supported by CMU walls, which required a concerted effort to coordinate the steel with the CMU-embed connections. Other steel elements include a special counter-balance stair system ordered from Belgium.

Harrison, Walker & Harper completed the \$21.3 million center, which includes nine locker rooms, a weight room, a treatment area, training rooms,

a wrestling area, VIP meeting areas, theater classrooms, an 80,000-square-foot indoor turf practice field, a football/soccer field and an eight-lane competition track.

A 5,200-square-foot injury rehabilitation clinic within the center offers services such as chronic traumatic encephalopathy (CTE), and occupational and physical therapies—not only for athletes but also for residents of the community as well. The clinic, partnering with Texas Health Resources, is the first of its kind in northeastern Collin County, one of the fastest-growing counties in the nation. In addition, students studying in the occupational health program at Melissa ISD can observe Texas Health Resources' doctors and physical therapists as they treat sports injuries.

Top-of-the-line technology serves to protect home athletes and visiting athletes and facilitates safe training, practices and competitions. This includes the use of a woodchip pellet material used for the outdoor practice field that stays cool in Texas heat and adds cushioning to prevent injuries.

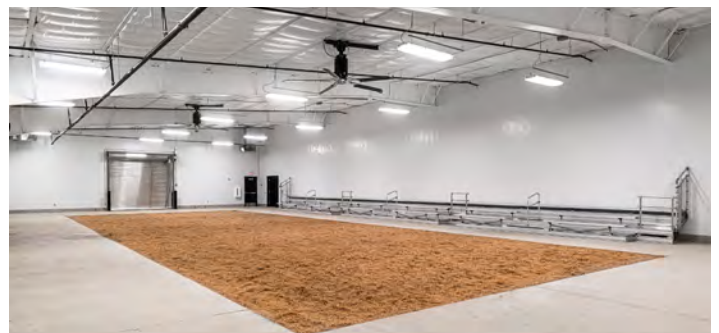
Vo-Ag Complex

Pryor Public Schools

Pryor, Oklahoma

Architect: The Stacy Group

Builder: Crossland Construction Company, Inc.



Pryor Public Schools in Pryor, Oklahoma, is big on providing vocational and agricultural education; but its programs were previously spread out, creating an inconvenience and lack of efficient use. The solution—construct four new buildings to house the different educational opportunities all in one location. With a total of 71,000 square feet of space, these four structures provide areas for a show barn and a cattle barn, a maintenance building and a bus barn with covered parking.

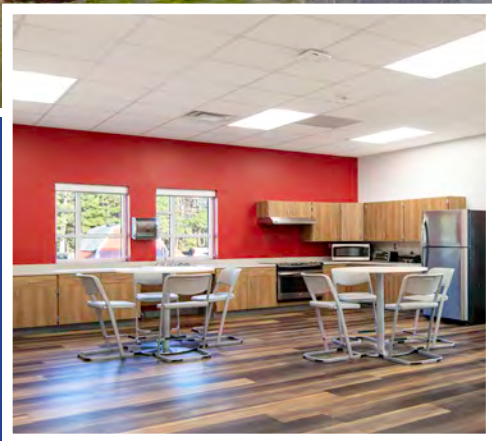
While choosing to save on the exterior by incorporating a cost-efficient metal building solution, school officials opted to spend the majority of the \$8.3 million budget on the interiors to optimize the

function and learning capacity of each area. In particular, the automotive maintenance shop has a car lift like that of a car dealership as well as a bus lift. The show barn has an arena lined with decorative metal along with tac rooms, holding pens and a wash station.

Each building has an eave height of 24 feet, a standing seam roof and metal panel walls. Despite 80 weather days, the construction team delivered the project on time and under budget. The new complex is currently considered to be the only one of its kind in Oklahoma.

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

Architect: RRMM Architects
Builder: Blueridge General



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