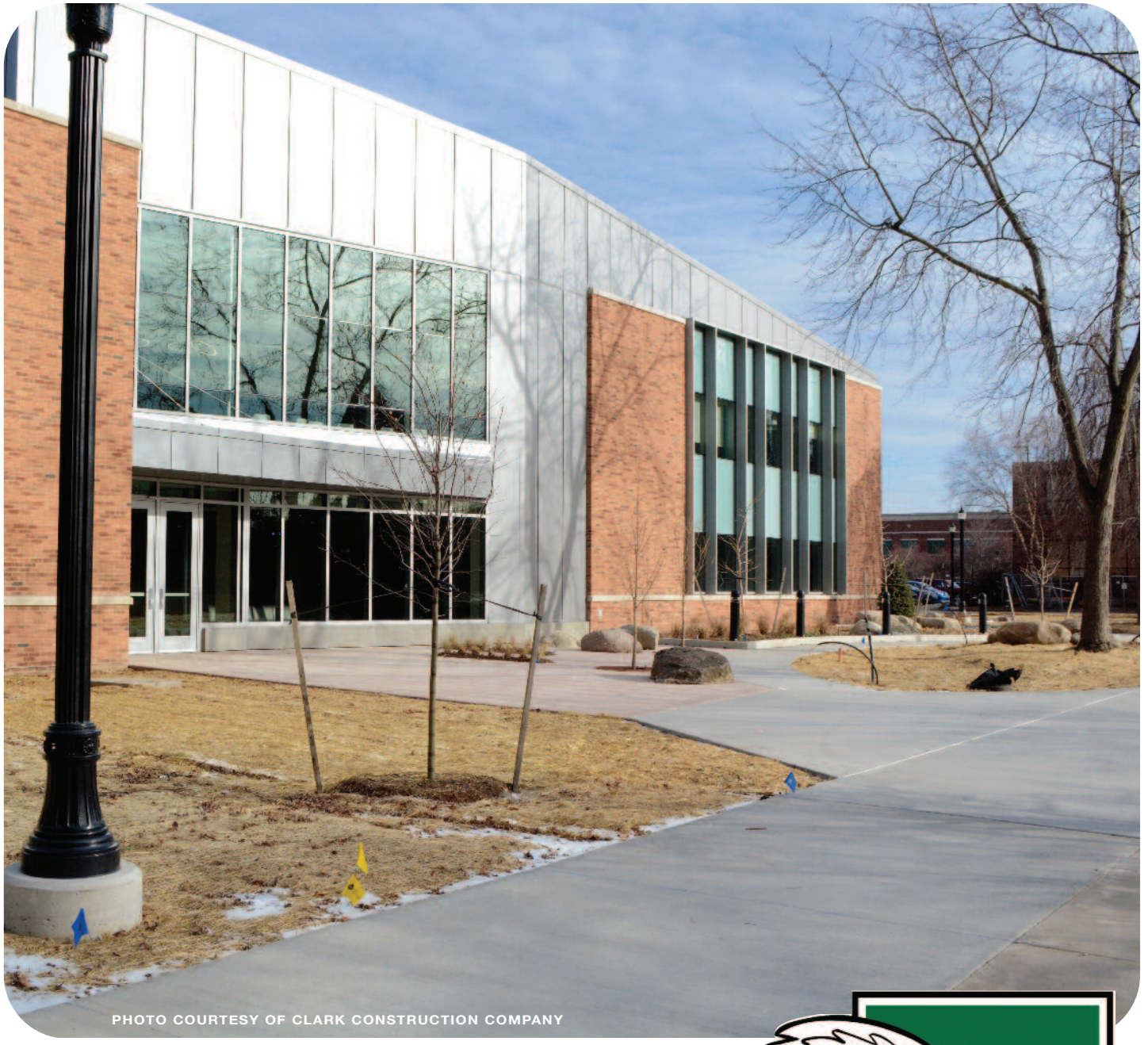
Masonry Strong

Baker Assists in the Revitalization of Eastern's Strong Hall



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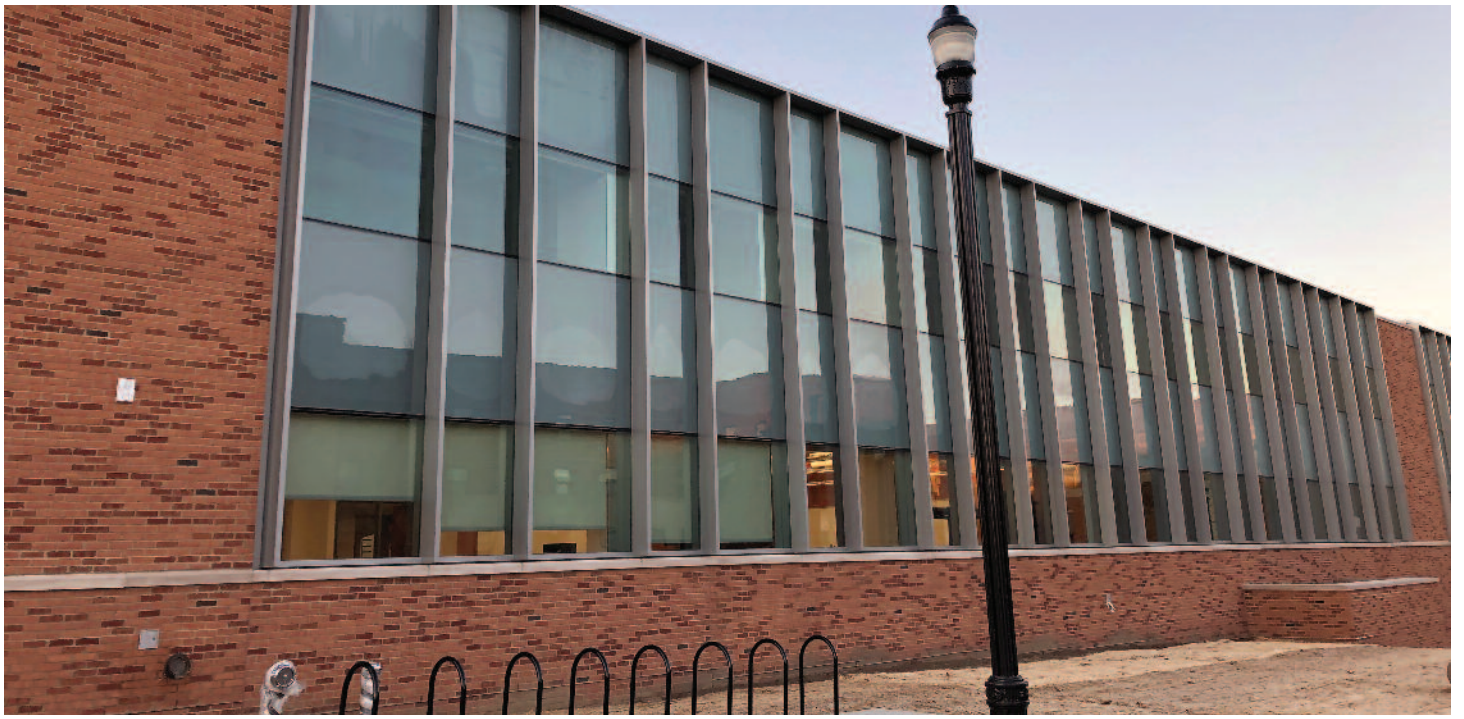
By **Mary Kremposky McArdle** Associate Editor



Exterior building materials – brick and aluminum/glass curtain wall – were selected to harmonize with the other buildings of the science complex, and were detailed for durability and energy efficiency.

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Eastern Michigan University opened the newly renovated Strong Hall and its new addition to students in January 2019. The $40 million project crafted more functional spaces for its Science, Technology, Engineering and Math (STEM) programs and brightened the interior, offering more natural light throughout the 81,000-square-foot building originally built in 1957. Baker Construction Co, Inc., a masonry contractor based in Whitmore Lake, helped to revitalize the building's brick exterior and to clad a portion of the new 20,000-square-foot addition in brick veneer and limestone accent bands.

In the remaking of Strong Hall, Baker Construction secured one of its first design-assist masonry contracts. Because design-assist is uncommon in the masonry trade, Baker Estimator and Project Manager T.C. Baker "applauds Clark Construction for thinking outside-the-box." Clark Construction Co., Lansing, served as construction manager for the Stantec-designed project.

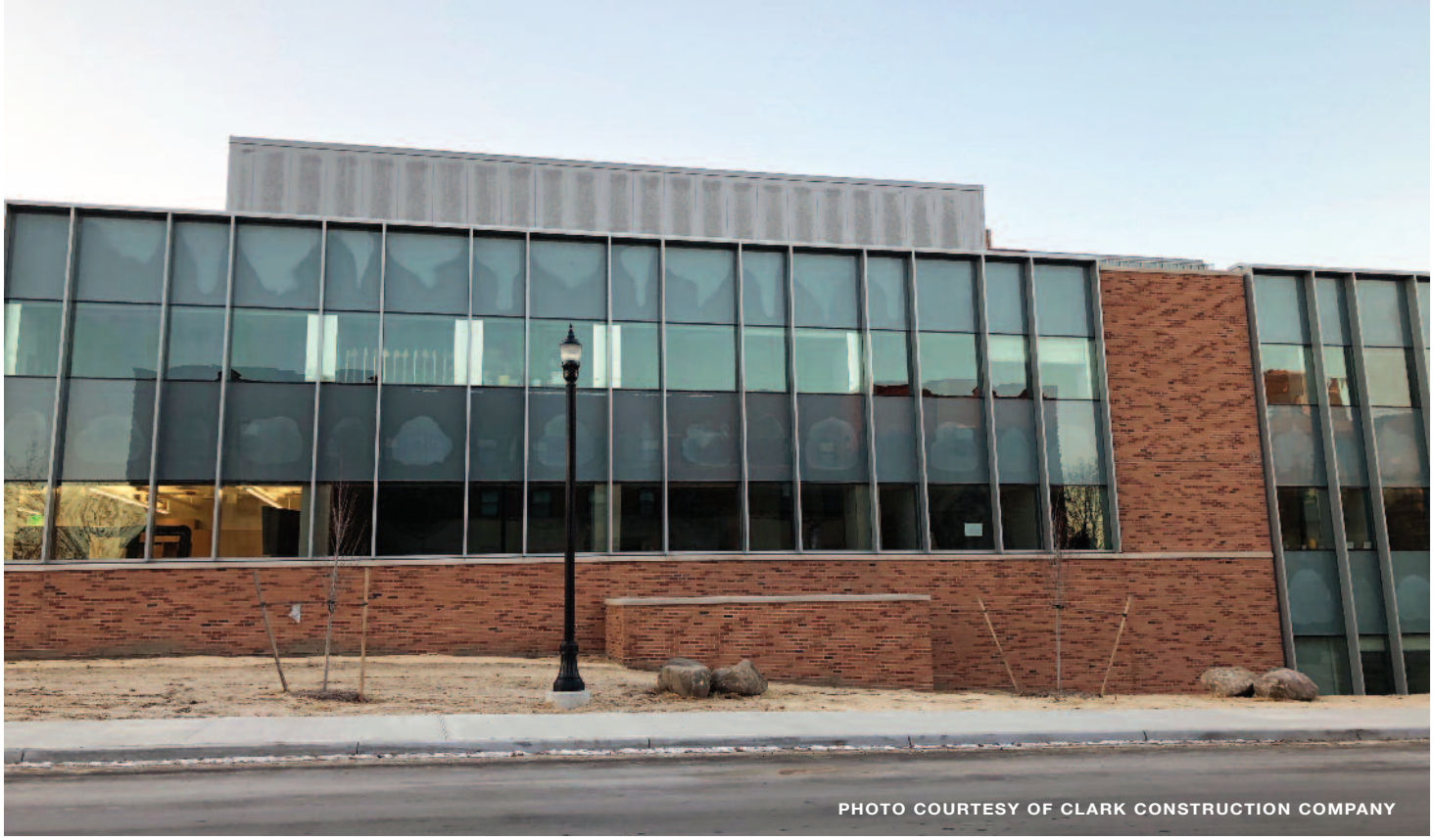
Clark Construction opted for a design-assist masonry contract for the Strong Hall project "to confirm marrying details with adjacent materials, to help with the details of cladding the existing three-wythe brick auditorium structure, and to confirm budget and offer cost/schedule savings ideas," said Clark Senior Project Manager Rick Hutter.

Marrying the Details

The new addition houses a sun-washed atrium and community center. The making of the addition is a case study in marrying the details of a diverse building envelope across multiple trades. As a factor in this successful "marriage," all of the building envelope trades were design-assist partners, including Baker Construction.

The MEP and elevator trades were design-assist partners in their respective disciplines as well. All of these trades collectively comprised "the majority of the work and the majority of the cost," said Hutter. "These trades had the biggest impact on the project's overall design and budget. Their expertise in these systems was invaluable.

"We enjoy working with Baker Construction," Hutter added. "We have



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Using a design-assist approach for the masonry trade and for all of the building envelope trades made for a smoother project, because details were formulated ahead of time. In their respective disciplines, MEP and elevator trades were design-assist partners as well.

partnered with them on numerous projects. They bring a great team attitude to the project, and they do great work."

Baker Foreman Bob Wischer, a 25-year "veteran of the scaffold" with Baker Construction, describes the addition's masonry wall assembly: A layer of DensGlass exterior sheathing was installed over metal studs. After installing three-inch anchors to the metal studs, Baker Construction brought RAM Construction Services, Livonia, on board to install three inches of liquid-applied spray foam over the DensGlass. "RAM was our subcontractor and partner through the entire design-assist project," said Baker. "They did a good job and helped us to be successful."

The exterior façade itself is brick with a series of limestone belts, including a waterbelt at the wall's lower reaches and 20-inch-wide stone caps forming a large limestone belt at the top of the parapet wall, according to Wischer.

In the design phase, Baker Construction attended a design-assist meeting with the architect to confirm the masonry details and the connecting details to other façade elements. "They went through details and said, 'Do you like the way this was done or do you not like the way this was done?'" recalled Baker. "Most of the details were the way we would have done it. It was good, but that's not always the case in all projects."

Hutter points to specific cost savings in the design-assist phase as well. "Baker Construction helped detail transitions from brick to curtain wall and metal panels," said Hutter. "Cost savings included eliminating stainless steel flashing below grade."

In the field, using a design-assist approach across multiple trades made for a smoother project. "Details that impacted multiple trades, such as tying together window opening details involving masonry, an air barrier and windows, were hammered out ahead of time," said Baker. "When it was actually being installed, there were no major concerns."

A New Brick Face

Baker Construction's work included renovating the existing three-wythe brick auditorium structure. The auditorium/lecture hall is located next to the new addition. "We veneered over the

old existing masonry on two walls of the auditorium," said Wischer. "The existing brick was left in place, and we installed masonry anchors to the existing brick. RAM Construction spray-foamed insulation over the old brick, and we then gave it a new brick face."

That was the basic plan, but the renovation opened the usual Pandora's Box of unforeseen conditions in an aged building. In this particular case, water damage impacted both the existing steel flashings and the existing brick. "Some of the old flashings had deteriorated beyond what had been anticipated," said Wischer. "Some of the structure behind the existing brick that we wanted to cover was not sound enough. There were a couple of areas where steel had to be replaced because of water damage. One area in particular was worse than the others, and they had to replace an entire piece of interior steel structure."

Because of water damage, "some of the old brick had deteriorated, and so at that point, it had to be determined what brick was usable and what was not usable," continued Wischer.

Baker Construction and other trade contractors offered suggestions, submitted a Request for Information to the architect, and the architect's structural engineer made the final determination. As a solution, "we had to take the brick down until we reached a solid section and then rebuild the removed area," said Wischer.

Masonry Investigators

As part of the overall renovation, some sections of the existing building were taken down to the steel structure, metal framing was installed to create window openings, and Baker installed brick veneer as part of the new façade. In this portion of the renovation, other anomalies were discovered, including variations in the wall's height elevations. "On any renovation, you always have to anticipate these types of variations," said Wischer. "For instance, it is supposed to be 11 feet from the first floor to the second floor of the existing two-story building, but in some cases, it would be 11 feet two inches."

Baker Construction brought its masonry expertise to other facets of the renovation as well. "They were instrumental in the design of added collaboration rooms into the existing brick structure, resulting in a better, safer, and more cost-effective project," said Hutter. "Also, Baker Construction did a lot of investigation of the existing structure (Area B) and assisted with detailing what and how the structure could be shored, re-supported, repaired, and removed in order to work with the new skin and roof structure."

Reading the Drawings on the Wall

Given the masonry industry's in-depth knowledge, design-assist masonry "could save a building owner a great deal of money, particularly for complex masonry projects," said Baker. "And it's not just us. There are other masons in Michigan who are knowledgeable as well and could save building owners a ton of money."

Baker himself serves on the Wall Design Committee for the Masonry Institute of Michigan (MIM). "The committee is tasked with creating generic masonry designs that are all posted on MIM's website," said Baker. "The idea is that they are the best and most economical design for any particular type of detail. We don't have every single detail under the sun, but the basics are on the website and available for use for free."

Baker uses the MIM website design templates to demonstrate the best masonry practice on any given job. "Anytime we are building a job, I always look at it ahead of time," said Baker. "If I notice something that's not necessarily wrong, but maybe it's not the best way or it's an outdated way to do the masonry, I always make a suggestion. I try to back it up with data from MIM's website."

In the future vision of a mason's heaven, Baker hopes the design and construction industry will incorporate design-assist masonry into the project at an earlier stage. "I would hope we are brought on during schematic design to help finish the masonry design of the building," said Baker. "That is where could have a significant impact and where we could

have something to do with the actual structural portion of the design and not just the functionality of the current details."

Managing Site Logistics

Beyond the actual masonry design details, site logistics presented Baker Construction with another challenge on the Strong Hall project. A series of mechanical tunnels, along with water, sewer and gas lines, crisscrossed the site. "I couldn't bring a machine in or drive over these areas without the potential of collapsing a tunnel," said Wischer.

The drawings and site investigations pinpointed the location of the tunnels and utility lines. Each of these locations were flagged or spray-painted to alert the trade contractors. "We have encountered this type of underground grid in other university and hospital campus complexes, but not to this extent," said Wischer.

As a solution, Baker Construction installed a series of wide steel mats over these areas to displace the weight of the masonry-loaded equipment. "These were much wider mats than usual," said Wischer. "We used maybe a half a dozen 12-foot-wide-by-8-foot-long mats. If there was a 100-foot stretch of wall, however, we could only work on a 40-foot section of it. It limited access, so we were only able to work on a certain portion of wall, say from control joint to control joint."

Limited access did not delay the schedule. "It took a bit of foresight and planning to make it happen," said Wischer, "but it didn't impact the schedule."

The use of a hydro-mobile scaffold assisted Baker Construction's field team in working in excavated areas not yet able to be backfilled. "The hydro-mobile can be placed in different configurations and can even go around corners," said Wischer.

In one instance, Baker used the hydro-mobile scaffolding system to create a 12-foot bridge that curved around a corner. "In another case, because of underground sewers, there was not enough solid compacted surface available to build a scaffold on," said Wischer. "We made adjustments to the hydro-mobile scaffolding system to allow work to continue in that area."

Begun in Fall 2017 and completed in January 2019, Strong Hall is a milestone for Eastern Michigan University, "as it marked the completion of the third and final phase of the Science Complex, which includes the renovated Mark Jefferson Building and the Science Complex Addition," according to Eastern's website. "The building represents Eastern's ongoing commitment to educating students in STEM disciplines and preparing them for careers in high-demand fields. Construction involved a complete building renovation and addition for a crucial facility that houses numerous labs for STEM classes."

Thanks to Eastern Michigan University, Clark Construction, Stantec, and Baker Construction, along with the entire design-assist and trade contracting team, the project successfully transformed the entire structure, including both the visually striking changes and additions in the new atrium area, along with the necessary updating of architectural, structural, mechanical and electrical systems.

The addition draws in natural light and the innovative light fixtures, mimicking planetary orbits and forming constellations, boost the appeal of the new atrium space.

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Stantec's Design Modernizes Eastern's Strong Hall

Eastern Michigan University's Strong Hall renovation and expansion project was a much-needed modernization of the third most-trafficked academic building on Eastern's campus. Stantec's redesign of Strong Hall resulted in an inspiring learning environment for students.

Features of the design reinforce the geology, geography, physics and astronomy programs housed within the building: Light fixtures in the atrium mimic planetary orbits and form constellations; natural materials, such as copper panels and travertine, create the illusion of a cross section of the Earth; views to the outside highlight the dry riverbed concept and its use of indigenous boulders; and a bioswale, blooming with native Michigan plants, is a prominent feature of the landscaping.

The addition of high-level finishes in public spaces and daylighting throughout breathed new life into the building. Coupled with efforts to support a more diverse body of students, the entire building is now handicap accessible. Both efforts offer a more inclusive environment and better meet the university's cultural aspirations.

Perhaps the most transformative element of the Strong Hall project is its new atrium designed to house social and study space. The new addition's open space offers a variety of seating and collaboration options for students and serves as a major source of natural light within the core of the building.

The design improves circulation by expanding the narrow stairway connecting Strong Hall to the Mark Jefferson Building as well. Additionally, incorporating built-in bench seating in corridors alleviates a prior issue concerning students sitting on the floor while waiting for class.

-Content Courtesy of Stantec