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When the Muskego-Norway School District realized the necessity for renovating and enlarging their high school, Eppstein Uhen Architects, Inc. was charged with developing a plan that would modernize the facility and provide additional space, while minimizing costs.

Because the existing school already included several separate additions involving five different colors of brick, the designers needed to utilize construction materials that would create a balanced and unifying aesthetic to the fragmented building. Masonry was the logical choice, not only for its design flexibility, but also because of its durability, energy efficiency, mold resistance and superior acoustic properties. According to Eric Dufek, AIA, "Masonry gave us much more flexibility in terms of incorporating patterns, texture and functional attributes, such as sound absorbing concrete masonry units in the gymnasium."

The project broke ground in April of 2002 and footings for the new additions were installed in June. Construction was under an extremely tight schedule since it was critical to get the building shell in place by winter to protect interior finishes and keep the project moving forward. For this reason, the design team explored the

(continued)

MUSKEGO HIGH SCHOOL Muskego, WI



OWNER:	Muskego-Norway School District
ARCHITECT:	Eppstein Uhen Architects, Inc. Milwaukee, WI
CONSTRUCTION MANAGER:	Hunzinger Construction Co. Brookfield, WI
STRUCTURAL ENGINEER:	Pierce Engineers, Inc. Milwaukee, WI
MASON CONTRACTOR:	Fred Kinateder Masonry, Inc. Waukesha, WI

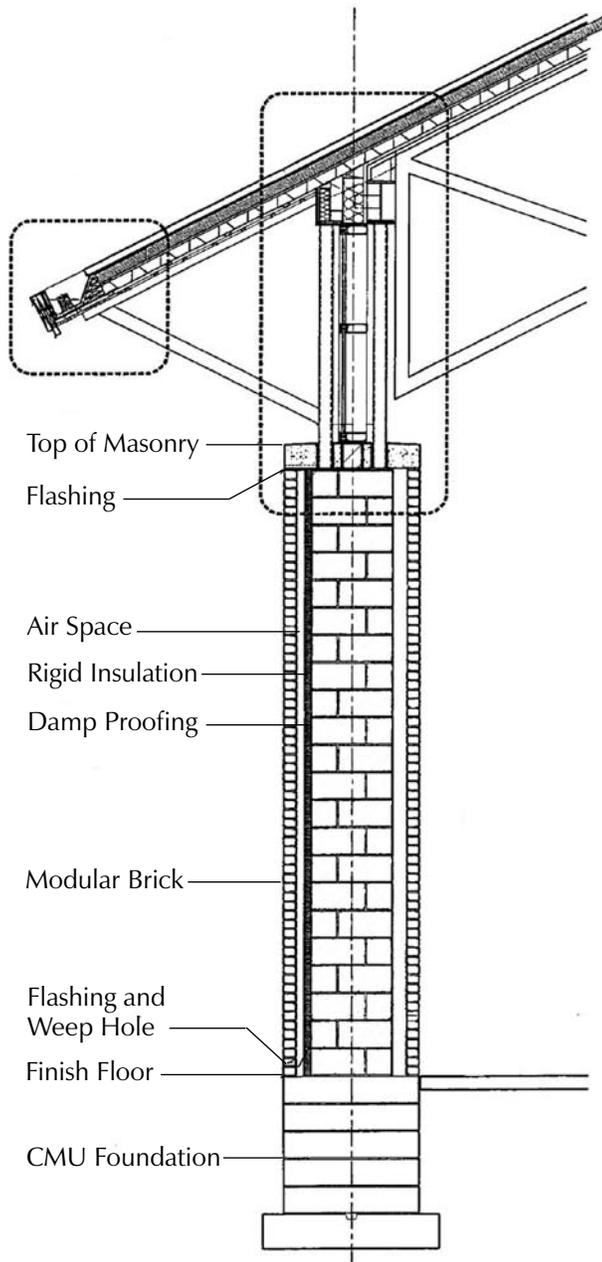
LOCAL UNION: International Union of Bricklayers and Allied Craftworkers, Local #8, Wisconsin

AREA: 120,000 sq. ft. addition; 210,000 sq. ft. renovation

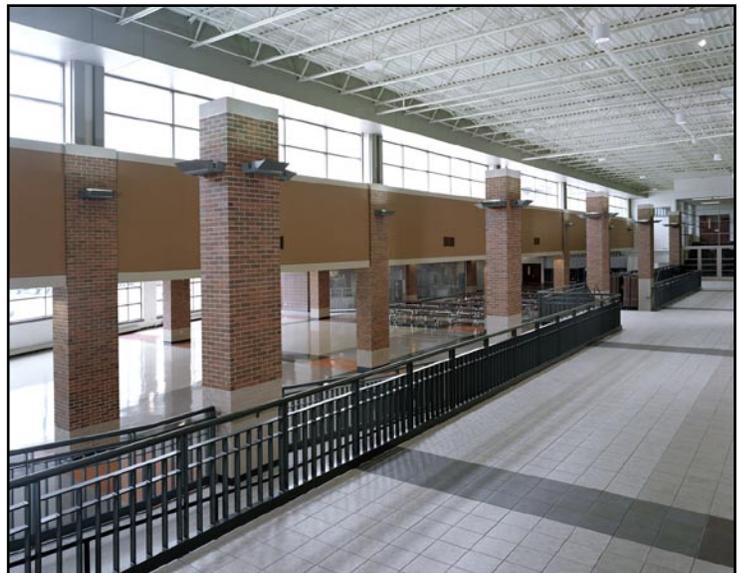
STRUCTURE: Loadbearing masonry cavity walls, rising as high as 50 feet for those enclosing the auditorium fly space.

PROJECT COST: \$36.6 Million

SPECIAL FEATURES: 2,500 person capacity gymnasium, state of the art cafeteria and auditorium, fine arts wing with music and drama rooms, two new classroom areas, new main entry and new administrative office area.



Masonry Pier Wall Section



The project included the construction of both loadbearing and non-loadbearing interior partitions, as shown above in the Auditorium Interior Lobby (top) and the Student Cafeteria (bottom).

use of precast panels for the building envelope. The idea was discarded in favor of loadbearing masonry exterior walls. Precast panels would have driven costs up by one third, and the required steel framing would have caused an estimated 14-week lag time in the schedule.

According to Rich Kubly, Senior Project Manager for Hunzinger Construction, “Loadbearing masonry could beat that schedule and keep the project on track while creating job site momentum that carried over to the other trades.” Loadbearing and non-loadbearing masonry was also chosen for the school’s interior partitions because of its mold-resistance and its ability to minimize the risk of material damage from exposure during construction.

Mason contractor Fred Kinatader notes that the biggest challenge faced by his company and BAC Local 8 Wisconsin craftworkers was the tight construction schedule. In order to help prevent construction

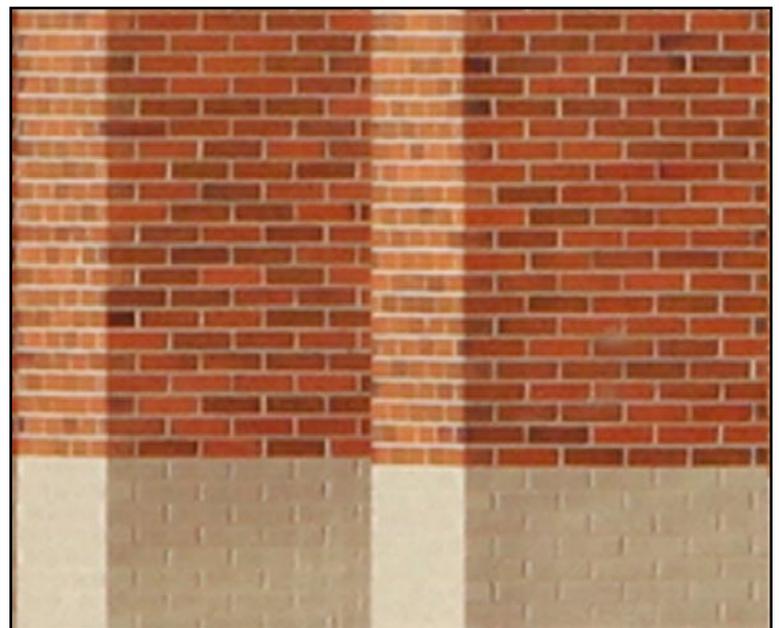
delays, Kinateder Masonry guaranteed masonry-opening sizes as indicated on the shop drawings. This meant that glass could be ordered without field verification of the opening sizes, greatly speeding up the construction process.

Kinateder notes that, “Because of the layout of the three separate additions, and our union trained workforce, our productivity soared. At our busiest point, we had 50 craftworkers, 3 foremen and 6 forklifts on the job. We pulled the other trades along.” Project manager Rich Kubly agreed. “Masonry truly pushed the project along and created positive job site momentum.”

Although the summer work schedule was the most intense, much of the work was accomplished during the school year. This required working safely in an occupied building while students, staff, parents and visitors were arriving and leaving throughout the day. Kinateder credits the project’s success to the strong working relationship between the construction manager, architect, school administrator and onsite masonry supervisor. “There was exceptional coordination among the entire team. We all considered each other’s requirements and worked together toward the goal of completion.”

Working around a busy school was certainly the biggest construction issue, but from a design perspective, working with the existing structure was another concern. Both the owner and the architects wanted to avoid an overly institutional feel, but still create spaces that would hold up to heavy daily use. The architect chose to use modular brick, for both its scale, and because the brick proportion was the perfect compliment to the large expanses of glass and exposed structural steel at the building’s three main entrances.

While the use of larger clay bricks or split-faced CMU are often substituted to save costs, Kinateder notes that, “Sometimes larger units will crack and create water penetration. The use of modular brick eliminates





that problem.” By using a warm-toned brick and accent brick band, designers were able to transform four separate building additions into one cohesive unit. At the three main entrances, the brick extends from the exterior skin to the interior spaces, providing warmth, durability and aesthetic unity. The exterior brick is also extended to the interior at the athletic entrance, where it merges with burnished block leading into the cafeteria. The burnished block creates an attractive environment for student break time, while also providing maintenance-free durability.

In the gymnasium (shown above), walls constructed with CMU allowed designers to incorporate acoustic block. Architect Eric Dufek notes that constructing the gymnasium with masonry saved the district significant money since separate, acoustically absorbing materials weren’t required.

Despite the challenges that the construction and design teams faced in making an aging school more modern and economical, the end result is a building that serves as the focal point of the community, and one that will last for years to come.

For additional information on the project detailed in this IMI Case Study, contact:

*Pat Conway, AIA, CSI
Director of Market Development & Technical Services
IMI Wisconsin Area
1406 Bus. Hwy. 18-151, Suite 203, Mount Horeb, WI 53572
Ph: (608) 437-6871 Fax: (608) 437-6941 pconway@imiweb.org*

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**International
Masonry Institute**

42 East Street, Annapolis, MD 21401
800-IMI-0988
Fax 301-261-2855
www.imiweb.org

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