When one of the inspectors tells you that you've got one of the finest constructed buildings in Jackson County, you know you've chosen the right team,” shared University President Charles Webb at the dedication of University Hall on the campus of Spring Arbor University in Spring Arbor, MI. That was just the icing on the cake for the University, as they prepared to open the newest residence hall to 214 students – full capacity – in the fall of 2010. The 21st Century has seen the number of students choosing on-campus housing at Spring Arbor nearly double and the administration has been racing to keep up. Gainey Hall was opened in 2006 and many rooms, intended as doubles, were facing triple occupancy. The small, private university builds on an as-needed basis. And needed, they did.

Winning Design

Gainey Hall, built four years earlier, is a winner with students. Jerry White, vice president for finance and administration says that students love the layout and the way the building promotes community. They hoped to replicate that success with University Hall. There are 107 sleeping rooms, but also a large, open lounge area, a study lounge, a conference room, laundry room, prayer chapel, exercise room, television room and game room – the comforts of home and the space to congregate or find some solitude – all under one roof.

Two double-loaded corridors converge at the front of the building forming almost a V-shape. Thanks to the gently sloping site, the lower level is only partially underground, with windows positioned high on the interior room walls to have views to the outside and to allow natural light inside.
The largely brick campus dates back to the 1870s, when it was founded as a seminary school. Having undergone many programmatic changes and building additions in its 140 years, the campus landscape had not changed much in the past 40+ years. Since 2000, however, the University has added 174,000 sf of new construction and renovated 69,000 sf. Building aesthetics are chosen to be complementary to those existing, but not necessarily to match or follow strict design guidelines.

University Hall follows the masonry detailing precedent set by Gainey Hall and other campus buildings, but makes its own statement with split face architectural block at the base and similarly colored cast stone detailing around the main entry, at the transition from block to brick and at window lintels and sills. The custom brick blend of reds and blacks is made particularly rich through its proportion of cross set and flat set units. Set refers to the unit's placement on a kiln car for firing and drying. Cross set brick tend to have less uniform color because they are set, or placed, face-to-back. The texture is knife cut. Utility brick is laid in a 3/4 bond with soldier accent courses.

**Structural Model** Loadbearing masonry was the wall system selected for many reasons, but one stands out above the rest. From groundbreaking to student move-in allowed only 10 months for the 53,000 sf facility to be constructed and completed. The aggressive schedule could be met by in-stock, shovel ready CMU. Once work had begun, the CMU walls were up in 13 weeks.

The four-story structure was designed with a hollow prestressed concrete plank floor system which was coordinated with the CMU erection. Bricklayers build one story, then the floor crew comes in and sets the floor plank. Bricklayers go back to work on the next story and so on. Schedule and coordination were crucial in meeting deadlines without incident. Mason contractor Davenport Masonry’s owner, Ed Davenport praised the seamless process between his crew and the floor plank installer, Strescore. Davenport has worked with Strescore on many projects establishing great synergy, perfecting their systems.

**Loadbearing insulated masonry cavity wall and hollow core, prestressed concrete slab systems should be the model for this style of student housing** explains Davenport.

“Loadbearing, insulated masonry cavity wall and hollow, prestressed concrete slab systems should be the model for this style of student housing,” explains Davenport. “It is the best, most cost-efficient design.” In addition to being cost-efficient and quick to erect, the properties of each work together to create a durable, fire-safe building with additional acoustic and high energy performance benefits.
University Finds Model

This building housing 214 men with 24/7 activities must be indestructible. Of utmost importance is the residents’ safety. By choosing not just a masonry enclosure, but many CMU partition walls inside, combined with this floor decking, fire compartmentation occurs. Two-hour fire ratings on the interior wall system minimize spread, while allowing residents safe egress. This same partition wall/floor combination also produces excellent acoustic performance from impact (footsteps, hammering) and airborne (voices, music) sound transmission. Environmental controls like this can favorably impact residents’ sleep, health and productivity.

Masonry enclosure walls are comprised of 8” CMU, 2” spray polyurethane foam insulation, 2” air space/drainage cavity and 4” face brick, architectural block and cast stone veneer, producing a 16.96 prescriptive R-value for an opaque wall. (Foam insulation alone has R-value of 6.8 per inch.) In Michigan, the energy code requires a minimum R-Value of 7.6 continuous insulation for mass walls in Climate Zone 5, where Spring Arbor is located. Unlike metal studs and metal decking, the hollow prestressed floor and masonry cavity wall system does not act as a thermal bridge. Even with low R-value windows (approximately R2), the comfort level of residents will remain high, while heating and cooling costs for the University will remain low with a smaller HVAC system in operation fewer hours because of thermal mass. It is so easy to optimize energy performance over the building’s life by creating a high R-value masonry wall.

Nearly Indestructible

Masonry partition walls were chosen for design for reasons already given, but also for their durability and low maintenance. “We want to use this building forever and have it hold up to the daily rigors of housing young men,” states White. “It is much easier to apply a coat of paint than repair drywall.” Easier and less expensive. Allowing one material to provide structure and finish eliminates need for yet another material. This saves time and money during construction and also in the long run.

Making an Impact

Spring Arbor University is cognizant of the need to be energy efficient and environmentally friendly with campus building design, construction and operation. Students pay attention to that, too, says White. This spring, two student groups on campus organized electronics recycling events. Residence hall recycling in general has increased enough over the past year that bins are now emptied three times a week.

Environmental friendly policies and practices represent a cultural shift and continue to grow with awareness. Regionally sourced masonry products are created from natural and recycled materials.

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- Kevin Ryan, Owner - Masonry Developers

Winter Conditions  Construction of University Hall began in late fall and lasted throughout the winter. Winter protection was required in order to keep mortar and grout from freezing and production from grinding to a halt. Masonry walls had to be enclosed and heated according to standards set forth in the Code (TMS 602-08/ACI 530.1-08/ASCE 6-08.) When conditions are properly controlled, allowing masonry to be installed, to set and cure, weather need not be a hindrance to maintaining schedules. The same is true for the floor system since it is precast, cured and cut to required lengths at the manufacturing plant under closely monitored quality control conditions.

Team Effort  Construction of a structure of this size, especially through a Michigan winter, involves the cooperation of everyone on the team. This was a great team, as the high praise from the building inspector illustrates. Good coordination and good systems make for a successful project. They did a great job for us,” states White. “I was thrilled and think the students were even more so.” And that’s what it’s all about.