Originally constructed in 1907, then sitting in outdoor storage since the Frieze Building was demolished in 2007, the Carnegie Library limestone façade had tree saplings growing in its cracks. A good cleaning and trimming more than half of it’s 4’ depth allowed this former entryway to be incorporated into the new North Quad.

Extensive preconstruction planning equates to efficient execution

Designed to house both students and academic facilities, the large and complex North Quad, on the University of Michigan campus, is not typical of a university building. While an innovative approach to the building’s purpose and its high-tech functionality was developed, its exterior façade is respectful of the history and tradition of the University and of Ann Arbor. The site of the former Frieze Building, constructed in 1905, housed Ann Arbor High School and an Andrew Carnegie Library. The University purchased it in 1953. Because of its architectural significance, cultural and community heritage, the University requested that part of the historic library’s stone façade be incorporated into the new building. Davenport Masonry worked with Capital Stoneworks to prefabricate and install existing architectural elements—cornice, frieze and architrave—to create a pair of mural panels. Their timeless design is in keeping with the new façade, making the process congruous and producing an appealing outcome. It is a privilege to honor the past by including the magnificent natural limestone entrance commemorating its former existence.
Architectural detail sometimes subtle, as on this corner, sometimes ornate, increases the complex's visual appeal.

Looking closely at the building, one will observe that the different elevations do not repeat themselves. While this makes the project challenging to manage and construct, it also makes the building very unique and adds to its visual appeal. A huge amount of planning went into every aspect of North Quad.

Preparation and Management Keys to Success

Because of size and complexity, the University was more comfortable with the resources of two mason contractors working together. Davenport Masonry asked Baker Construction to work with us from the very start. In fact, this arrangement was part of the bid. It has worked beautifully having Baker, a 58-year-old, three generation, Ann Arbor area company, provide a portion of both labor and supervision. Although it is our first project under such an arrangement, it has been a positive experience and a successful operation.

Two different wall systems are designed within the project, with veneer changes on every wall.

Two different wall systems are designed within the project, with veneer changes on every wall. The academic wing of the Quad is seven-stories, while the residence hall is ten. A 156' bell tower, rising above the varying roof heights, is a focal point sure to be a landmark. Varying heights allow each portion to have its own identity and also breaks down the massive structure. In addition to salvaged stone murals, decorative diamond pattern brick and stone mosaics adorn the wall space between the windows of the academic portion, stone banding and accents are used in various ways throughout and the building surrounds a massive courtyard complex. There are two lower courtyards and an elevated courtyard, which feature a brick colonnade, many masonry planters and columns.

Due to the lack of site space, we used a shunting yard off site to store and marshal the stone and equipment. Careful coordination was essential to make sure the right pieces were on site at the right time. That management was a great part of the job. Large in sheer numbers, North Quad consists of 950,000 modular face brick, 150,000 concrete masonry units (CMU), 9000 pieces of limestone and granite, 800 pieces of glass fiber reinforced concrete (GFRC) and 180,000 sf of air barrier.

Brick and stone mosaics were built off site, as well. This decision reduced the potential for error in installation and also provided the masons ample work space to lay out the design, cut brick to fit and ensure accuracy of color blend and pattern from mosaic to mosaic. There were six different patterns of decorative panels, ranging in size from 3' x 3' to 3'4" x 9'4" which were each built as a single wythe wall backed with a coat of synthetically-modified mortar with additives and fiber ingredients providing added strength. Limestone was fabricated to fit the intended design, but the brick, a blend of six different blends, had to be cut and placed to fit by hand. Three bricklayers set up an efficient assembly line type of process, building all 51 mosaics in just a couple weeks, then prepared them for transport.

Custom clamps were built to hold these “walls” together from top to bottom as they were placed on A-frames for delivery, then set into the wall with a tower crane.

Because there was no way to get behind the wall panels to anchor them, masons drilled through mortar joints into the block backup to place an anchor typically used in restoration work. It may have taken a day to hand lay each brick piece into the wall as it was going up, but panelizing the brick and installing it as one unit in less than an hour allowed for better productivity and improved the schedule for all trades on site.

Logistics

The north wall runs parallel to, and just feet away from, a state highway. Portions of that wall are 138' tall. When working close to a major roadway, safety is extraordinarily important, for both construction workers and the general public. Around the University of Michigan, both vehicular and pedestrian traffic is constant. Scaffold installation, material handling and crane placement all factor into making a safe and efficient work environment.

Accessing the bell tower was another height challenge. One side is over a gable roof and another is over a sunken courtyard. We hired a scaffolding company to engineer and build the tube and clamp scaffold on the roof. The bell tower reached 50' above the eaves and more than 20' above the roof’s ridgeline. We engineered bridges connecting the hydraulic and tube and clamp scaffolding and made other modifications that would help crews gain the safest and optimal access to work areas and materials.

Two tower cranes serviced the project for all trades. Masons dominated much of the crane operation schedule – about 85%. In order to keep work for all trades flowing, Walbridge and Davenport Masonry worked together on the crane use schedule and management due to the massive quantity of lifts required. Having the other trades communicating directly with the mason contractor minimized wait times for all involved. High praise belongs to all parties for the efficient execution of material lifts.
As it is located above a basement, the elevated courtyard does not facilitate heavy lifting, resulting in many logistical challenges. The crane must transport material loads over the building into the work area. Minimal staging can be accommodated there.

Tight site restrictions reinforced the need for strong preconstruction planning. Once underway, there was literally no room to figure things out as we went. Because design changes on every wall, materials, patterns and quantities had to be determined in advance in order to have the proper items on site at the right time, have crane lifts scheduled and installation procedures determined.

Attention to Detail
We are impressed with the attention to detail taken by the architect to ensure that this building meets occupants’ needs and fits in well with the surrounding neighborhood. In turn, the mason contractors and crews are giving as much attention in executing the design. The classically designed exterior, coupled with state-of-the-art academic facilities and the first new residence hall built on campus in decades, truly expresses the character of the University of Michigan.

Bricklayers hand cut and laid brick and stone into 51 decorative mosaics found between windows, between louvers and on piers.

Ed Davenport is CEO of Davenport Masonry Inc, mason contractor specializing in new construction, restoration, preservation and building maintenance headquartered in Holt, MI. Davenport is a trustee on the MIM board, Mason Contractors’ Association (MCA) board, Michigan Mason Contractors Association (MMCA) board, president of Michigan Council of Employers (MCE) and regional vice president of Mason Contractors Association of America (MCAA). He has worked over 35 years in the construction industry, beginning as a laborer at the age of 17. He was recognized as Masonry Construction Magazine’s 2006 Industry Leader of the Year. Davenport Masonry was founded in 1993 with strong business practices, emphasis on training, safety and innovation. He encourages every employee to think and keep his/her mind open to new ideas, technology and processes.
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