Full-Court Press

Reengineered facilities help keep Temple University's basketball teams in the game.

BY GERARD FIORE, AIA, AND MYKHAYLO KULYNYCH, AIA

WHEN HEAD COACHES Fran Dunphy and Tonya Cardoza want their teams to step up their game, *up* is exactly where they send them.

The Temple Owls men's and women's basketball teams (coached by Dunphy and Cardonza, respectively) have found their prime practice courts on the top floor of a new $58,000,000 sports facility on the university's North Philadelphia campus.

A creative solution to urban space constraints, the new Pearson-McGonigle Athletic Complex, which opened this past spring, is a renovation and expansion of Temple's sports and recreation facilities, and a dramatic gateway to the campus from the north. A joint venture of H2L2 Architects/Planners and CVM Construction Managers, the project joined Pearson and McGonigle Halls—two adjacent buildings (dating from 1967) comprising an entire city block—added a two-story upper level for the basketball program and wrapped the front of both buildings with a monumental glass retail and recreation arcade that will light up Broad Street 24/7.

Good Sports

The new project adds an additional 140,000 sq. ft to the buildings' existing 225,000 sq. ft. It houses intramural and recreational sports facilities for basketball, volleyball and badminton, exercise/yoga rooms, contemporary weight/workout rooms, upgraded dance studios, a climbing wall, multipurpose classrooms, faculty and coaching staff offices and other programmatic areas.

The highlight of the renovation is the practice facilities for Temple's Division 1 basketball

◄ The Broad Street curtainwall, with color-changing LEDs embedded into the window mullions and illuminated stanchions for ornamental team banners.

R. A. Smith, Glass Artistry Architectural Glass & Metal LLC

teams, which feature men's and women's practice courts, locker rooms, hydrotherapy, recruiting and press lounges, coaches' offices, screening room for game tapes, sports medicine center, weight room and Temple University's Sports Hall of Fame.

Completely spanning Pearson Hall, the upper level structure provides an interstitial space above the original roof that serves as the main mechanical room for the addition. The 25-ft-high exterior wall trusses—painted a bright Temple red—were incorporated into the design as an architectural feature and are prominently visible from the street and surrounding buildings. (The trusses use W10x49 members for the top chord and W18xW50 members for the bottom chord; vertical and diagonal members are HSS12x12x½, and wind girts are HSS10x10x3/8.)

The existing exterior courtyard separating Pearson and McGonigle Halls is now enclosed with a new three-story atrium lobby. The atrium houses a café, lounge area and academic advising, and connects the two buildings vertically through a monumental stair. It serves as the main public gathering space inside the building and the new heart of the complex.

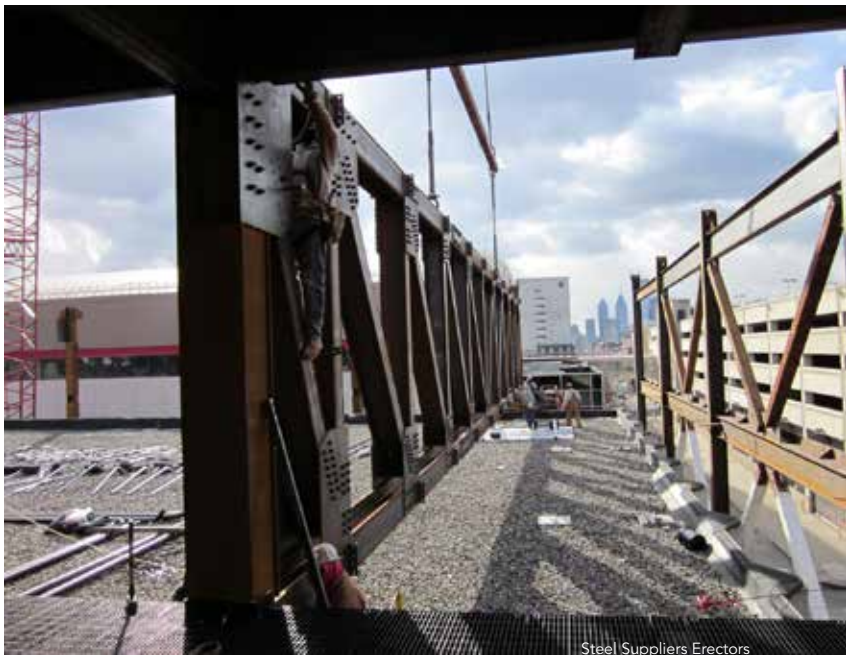
The atrium is linked to a two-story horizontal glass arcade that extends to Broad Street and runs parallel along the front of Pearson-McGonigle. Shops are planned for this sidewalk-level, which includes a climbing wall. Visible and accessible from the street, this recreation nexus is immensely popular with a student body whose status is rapidly shifting from commuter to residential.

Threading Through

The major structural challenge was to develop the truss framing system for the new facility and determine where new column locations could be threaded through the existing building, while keeping the building fully operational.

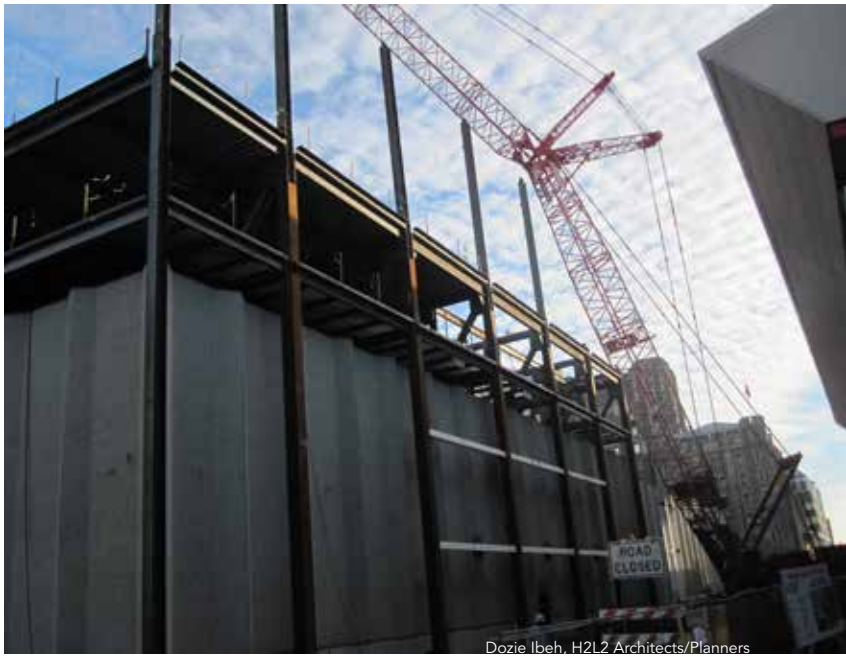
To create the new facility for the basketball program, the double-height floor had to cover the entire L-shaped footprint of Pearson Hall. This was achieved by spanning 145 ft with 13-ft, 6-in.-deep wide-flange trusses (top/bottom chords use W14x176, with W14x68 verticals/diagonals) spaced at approximately 25 ft on center to new steel-plated columns. Wide-flange beams supporting concrete-filled metal deck bridge the trusses to create the facility floor.

On four of the six sides of Pearson Hall the steel trusses are supported on new plated columns that straddle the existing building on a foundation of 3-ft, 6-in.-diameter caissons with 3-ft-diameter rock sockets extending into competent rock. On



▲ Above Pearson Hall, 13-ft, 6-in.-deep third-floor trusses are bolted into place.

▼ At the Montgomery Avenue façade, a 440-ton crawler with 300 ft of boom works on the braced frame.



Gerard "Jerry" Fiore, AIA, is a senior project executive at CVM Construction Managers, and **Mykhaylo Kulynych**, AIA, is design principal at H2L2 Architects/Planners LLC. You can reach them at **gfiore@cvmnext.com** and **kulynych@h2l2.com**, respectively.

▲ The Broad Street façade has a 25-ft "show truss" at the third-floor recreation courts and first-floor retail and recreation arcade.

the two interior sides of the L-shaped building, the new trusses are supported on 10-ft, 6-in.-deep transfer trusses spanning approximately 50 ft; transfer trusses were used to reduce the number of new columns that penetrate the existing building, as well as to reduce the number of new foundations required within the existing building.

Braced Framing System

The new roof structure is comprised of wide-flange trusses (top/bottom chords are W10x54, with double-angle 4x4x½ verticals/diagonals) spanning 145 ft to the new steel columns, with steel roof joists as the secondary roof members. Due to the size and geometry of Pearson Hall, an expansion joint was introduced, thus creating two, three-sided lateral braced frame systems. The lateral system consists of chevron braced frames, including one braced frame extending down through the existing building.

Because the building would be occupied throughout construction, extremely careful coordination in determining the new column locations had to be considered to respect an existing operational mechanical room, pool area and office and lab spaces. The interior columns are founded on 150-ton micropiles, some of which were battered to resist the horizontal component from the lateral braced frames. An additional nine new columns were also threaded through multiple levels of the pool area in the existing building to support an additional transfer truss parallel to the expansion joint.

These new columns and concrete piers extend down to the sub-basement level approximately 25 ft below grade. The existing sub-basement foundation is a 3-ft, 6-in.-thick concrete mat slab. Engineers analyzed the mat slab with the addition of the new concentrated column loads and determined that the slab was capable of supporting the new trusses above without exceeding the allowable bearing pressure, thus eliminating the need to add new costly foundations in the existing sub-basement.

A new 26,000 sq.-ft mechanical mezzanine floor was built that frames into the bottom chord of roughly one-third of the new floor trusses. The mezzanine floor framing consists of steel bar grating spanning to small wide-flange beams (W8x10) to keep the new dead load as light as possible.

Green Use for an Old Pool

Pearson Hall originally had diving and instructional pools side-by-side in the southwest corner of the lower level. For the upgrade, one instructional pool was renovated and the 14-ft diving pool, which had become obsolete, was adaptively reused. Above the old pool, a new steel-framed tiered lecture hall was built, incorporating the existing stadium seating with a new elevator for accessibility; stacked construction was used (W18x35 framing to sloping W14x30 girders) for this portion. The lecture hall is also supported on the existing mat foundation of the sub-basement, which eliminated the need for new foundations.

The pool itself was repurposed for rainwater runoff and collection. Water collection tanks were installed in the existing diving pool rather than locating them underground outside of the building footprint, where available land is at a premium due to the dense urban environment. With this approach, the design team avoided extensive and expensive excavation and foundation work, mitigated the impact on the land near the building and provided a gray-water source for the complex's bathrooms and other non-potable water uses.

Dozie Ibeh, H2L2 Architects/Planners

Dozie Ibeh, H2L2 Architects/Planners

▲ The third-floor recreational court with view of the 25-ft "show truss."

➤ The new third floor and roof structure surrounds Pearson Hall along 15th Street.

Enlivened Presence

Pearson-McGonigle, which used 2,815 tons of steel in all, is a lynchpin of "Temple 20/20," the university's vision to create an engaging pedestrian circulation system, gateway opportunities supported by commercial spaces and signature buildings that enhance the Academic Plan.

Transforming two 1960s vintage buildings into a single, modern, 21st century, LEED-Certified structure has redefined Temple's Basketball program, enlivened the school's presence along Broad Street and become a dynamic example of Temple's vision of the future. As coach Cardoza commented at the topping out ceremony in late 2010, "The renovation to Pearson-McGonigle Halls will provide all Temple students with the opportunity to be strong in body and spirit, as our classrooms and professors empower their minds." MSC

Owner
Temple University, Philadelphia

Project Management for Architecture and Engineering
CVM Construction Managers, Oaks, Pa.

Architect
H2L2 Architects/Planners, Philadelphia

Structural Engineer
CVM Engineers, Oaks, Pa.

Steel Team

Fabricator, Erector and Detailer
Steel Suppliers Erectors, Inc., Wilmington, Del. (AISC Member)

General Contractor
Hunter-Roberts Construction Group, Philadelphia