

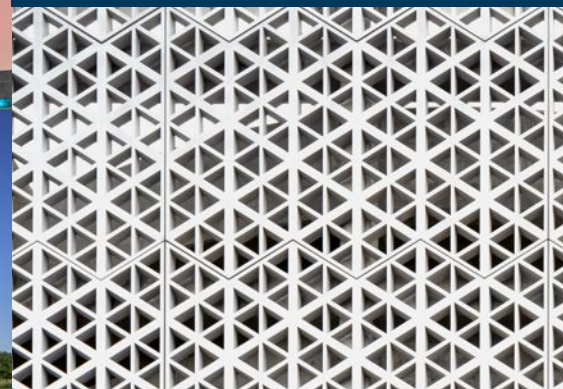
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ASCENT[®]

DESIGNING WITH PRECAST CONCRETE

DIGITAL EDITION

SPRING 2025



2025 PCI
DESIGN
AWARDS



Photo: @triggspphoto

With nearly 300 beds for the Virginia Tech Corps of Cadets, the new Upper Quad North Residence Hall at Virginia Tech is a total precast concrete solution featuring architectural precast concrete panels, floor slabs, shear and bearing walls, stairs, and more. The facility replaces Femoyer Hall, originally constructed in 1949, with a modern residence hall designed in the Collegiate Gothic style found throughout Virginia Tech. During the work, Tindall Building Systems of Spartanburg, S.C., took advantage of the flexibility, resilience, and sustainability of precast concrete technology to deliver a solution that the university can rely on for the long haul.

TRANSFORMATIVE, SUSTAINABLE, CADET-READY

On the building's exterior, architectural precast concrete panels maintain the historical significance of the campus grounds while providing an attractive residence hall for students and visitors. The project team selected a combination of precast concrete and veneer for the exterior, which was more budget-friendly than the all-native limestone alternative.

Leveraging precast concrete components also contributes to the building's sustainability and energy efficiency. The exterior walls are noncomposite with continuous insulation and nonmetallic wythe connectors to reduce thermal bridging. This design choice allowed for the attachment of the stone and precast concrete trim pieces without a break in the thermal envelope. The *R*-value requirements of the project were exceeded with just a 2-in.-thick layer of insulation, enhancing energy efficiency and reducing operational carbon. Additionally, the precast concrete floor slabs are wider than typical hollow-core slabs, and they were designed as continuous spans, which reduced the overall piece count for the project, enabling more efficient transportation with fewer truck loads and crane picks needed. The use of precast concrete panels also reduced waste both at the plant and on the jobsite. Due to these efforts, and others, the Upper Quad North Residence Hall earned LEED v4 Silver certification from the U.S. Green Building Council.

A few challenges were encountered during the project, including the handling of the architectural water table. While the building was designed to drain at the first level, this was not always possible at the base due to a sloping exterior grade. To solve this issue, the Tindall team had to "break" the panels so that there was always a joint at the first level. As a result, short panels were used at the foundation to support four levels of large precast concrete panels above; this arrangement allowed the contractor to leverage a continuous drainage joint at the water table, which would not have been possible with alternative materials.

Overall, the combination of a precast concrete bearing-wall system and slab floors as the primary structural system for the residence hall facilitated rapid erection. Also, the need for field inspections was minimized because shop fabrication was maximized. Thanks to these features and others, the Upper Quad North Residence Hall shines, providing optimal living quarters for the Virginia Tech Corps of Cadets.

Honorable Mention

Sustainable Design Award

VIRGINIA TECH UPPER QUAD NORTH RESIDENCE HALL BLACKSBURG, VIRGINIA

PROJECT TEAM

Owner:

Virginia Polytechnical Institute and State University, Blacksburg, Va.

PCI-Certified Precast Concrete Producer, Precast Concrete Specialty Engineer, and PCI-Certified Erector:

Tindall Building Systems, Spartanburg, S.C.

PCI-Certified Precast Concrete Producer:

GATE Precast, Oxford, N.C.

Architect and Engineer of Record:

Clark Nexsen Inc., Charlotte, N.C.

General Contractor:

Vannoy Construction, Asheville, N.C.

Project Size: 56,650 ft²

KEY PROJECT ATTRIBUTES

- Virginia Tech's Upper Quad North Residence Hall is a total precast concrete solution providing 300 beds for cadets.
- The Collegiate Gothic style of the building's exterior was achieved through a combination of precast concrete and veneer.
- The U.S. Green Building Council awarded the project with LEED v4 Silver certification for its sustainable practices and features.

PROJECT AND PRECAST CONCRETE SCOPE

- Precast concrete components include architectural wall panels, floor slabs, shear and bearing walls, stairs, and more.
- Electrical conduit and boxes for lighting were cast into the precast concrete components, reducing the need for on-site work.
- More than \$5.6 million worth of precast concrete was installed for the project.