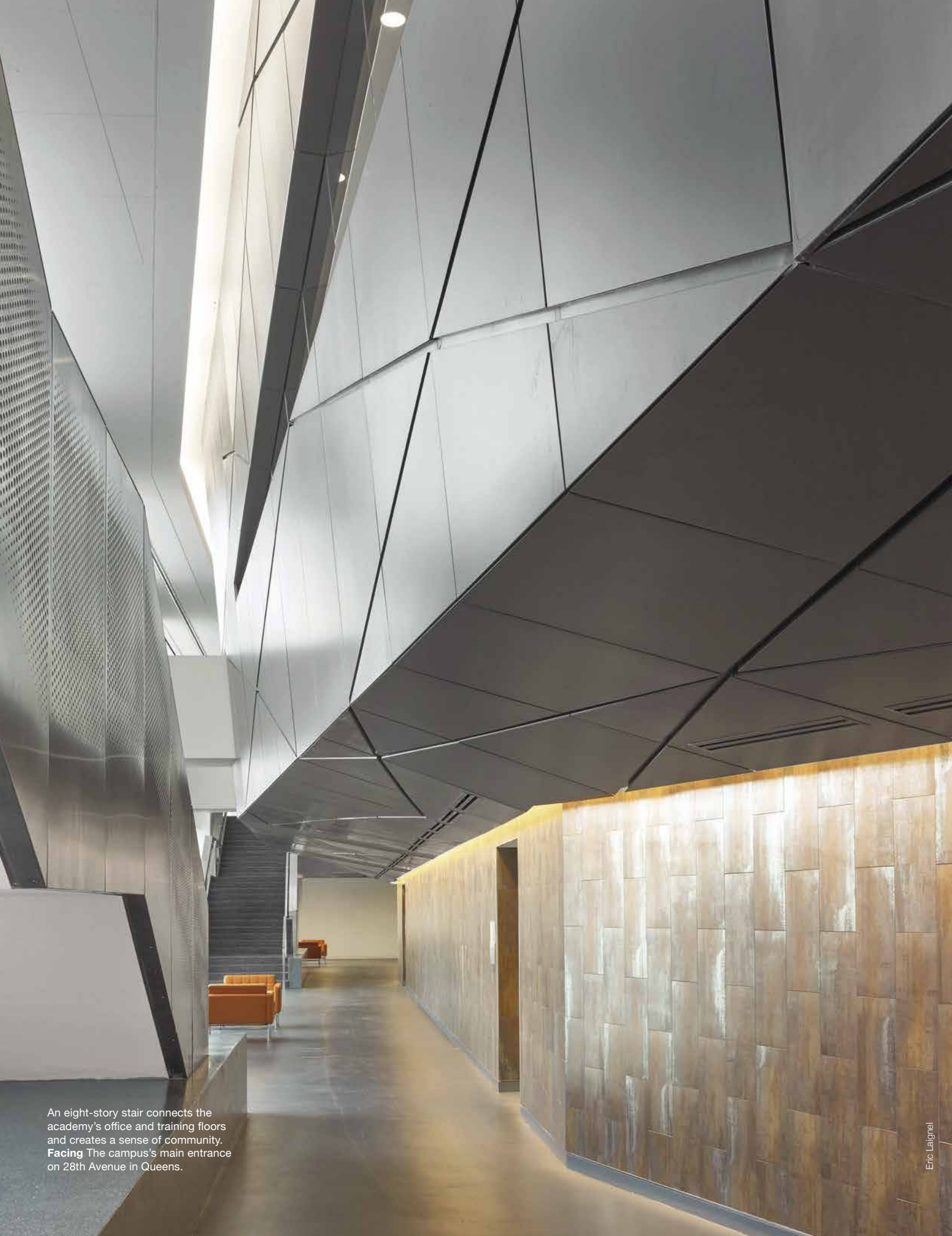


An eight-story stair connects the academy's office and training floors and creates a sense of community. **Facing** The campus's main entrance on 28th Avenue in Queens.

Eric Laignel

Ed Hueber

New York City Police Academy

The largest public building in New York to achieve LEED Gold certification, a new campus prepares recruits for success with considerations for optimized training conditions, quickly evolving technology, and adaptation to future requirements for public safety.

IF YOU CAN MAKE IT here, you can make it anywhere. Or so should be the tagline of the New York City Police Academy's new campus in College Point, Queens. Its 730,000-square-foot phase-one facility triples the space of the New York Police Department's former Manhattan-based academy, and thanks to the project's tremendous scope, "this was our opportunity to dream big and to think long-term," says NYPD Inspector Michael S. McGrath, the commanding officer of the Cadet Corps. Now recruit officers train for urban water rescue in a designated aquatic center, read the nuanced body language of robbery in a mock bank environment, and outsmart virtual threats in cyber-terrorism classes. Whatever a young police officer may encounter in her service to New York, she will likely have confronted its simulation inside this city-within-a-city first. Realizing this facility required as many structural solutions as there are training scenarios.

Although first proposed in 1985, the project as it is now completed got its kickoff in 2007, when city officials selected an NYPD tow pound near Flushing Bay—a wetland landscape—for conversion into the campus. Shortly thereafter the city's Department of Design and Construction, which supervised redevelopment, contracted with architect Perkins+Will with Michael Fieldman Consulting Architects, and the academy was formally dedicated last December. In the interim it earned two superlatives—as the first consolidated police academy campus in New York history, and its largest public building to earn a LEED Gold rating.

Perkins+Will senior project manager Laurie Butler remarks that, to accommodate the academy's diverse program, the designers had to tap deep expertise in educational and office buildings, "and we partnered really well with the police to develop physical training facilities. These typologies aren't unusual, but the accumulation of them all in one place is." In turn, the team made sense of the various uses by distributing them into a Recruit Academic Building and Physical Training Building along an east–west axis.

Standing eight stories tall and organized around a glass-walled atrium, the academic building includes classrooms, a naturally illuminated auditorium that seats 800 students, library, and offices,

as well as mock environments like that vulnerable bank. Meanwhile, the so-called PT building includes the cafeteria, 75-foot-long pool, and 45,000-square-foot gymnasium that spans 180 feet without interruption. An intertidal canal divides the two volumes, while the wings are bridged by an artery known as Broadway: The glass-enclosed circulation volume integrates with the south elevation of the academic building, emerges from it to traverse the canal, and then meets the PT building at its eastern elevation. By straddling the waterway, the program-led organization of the campus both enhances wayfinding and minimizes impact on local ecology.

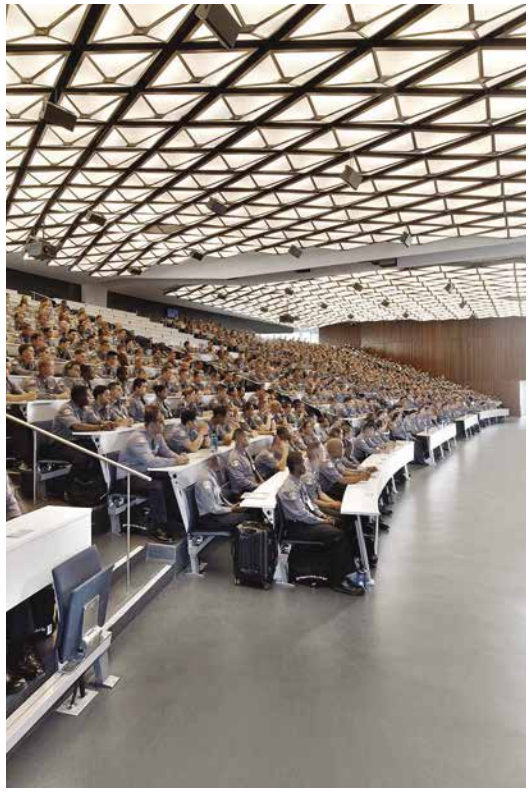
The wetland landscape did present other challenges to the structural engineering team comprising Silman, Guy Nordenson and Associates, and Weidlinger Associates. Prior to serving as a tow pound, this area of College Point was ostensibly constructed from fill, subjecting the contemporary site to significant settlement concerns that require transferring structural load to bedrock via deep piles. According to Thomas Reynolds, an associate at Silman, the academy stands atop more than 3,000 of these 14-inch-diameter steel pipe piles, which were driven 165 feet below grade on average and filled with concrete. In addition to the buildings, phase one of the campus includes a central utility plant located immediately to the west of the PT building.

While security prevents disclosure of detailed structural solutions, those same concerns figured

Clockwise from top left A connection point for Vierendeel truss columns. Installation of 60-inch-deep cellular beams every 10 feet on center over the academy's long-span spaces. Ironworkers from Stonebridge Steel Erection move a cellular beam into place. Concentric braced frames visible from training areas are made of 20-inch-diameter concrete-filled pipe columns and 16½-inch-diameter braces.

This page: Stonebridge Steel Erection

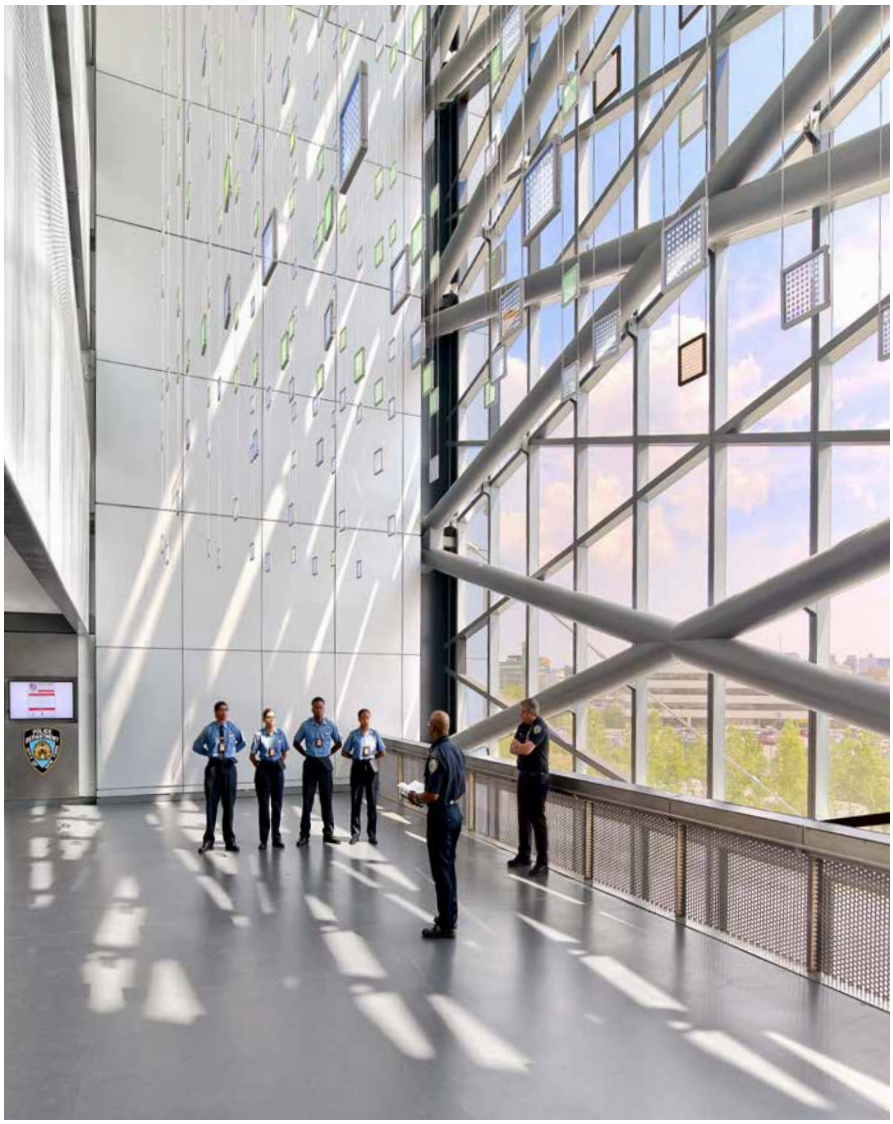
Clockwise from top The 45,000-square-foot gymnasium spans 180 feet without interruption. A skylit cafeteria space can seat 800 cadets at once. Lit naturally, an auditorium also seats 800 students.



largely into the structural design of the utility plant and buildings, such as the requirement that it prevent progressive collapse. “In addition, the owner chose to voluntarily upgrade the building to a higher structural occupancy category, so the campus could function as a staging area for emergency response teams during a natural disaster,” Reynolds says. “The decision created need for a more robust structural design than what was required by code based on usage classification.”

The team considered eleven different structural systems to accommodate these worst-case scenarios, and ultimately chose

This page: Eric Laignel



steel frame with concrete-on-metal deck floors. Reynolds says of the decision, "It was most sensible in terms of progressive collapse, flooding, and cost efficiency, and it allows the NYPD the most flexibility to make future changes." McGrath underscores the latter point, observing, "Before 9/11, we were a traditional police department that looked for the bad guys. Who knows what the next change will be? We train for all of it."

In the central utility plant, bays averaged 20 feet by 35 feet to accommodate large MEP units, with W24x55 infill beams with thirty-four ¾-inch-diameter shear studs spaced 10 feet on center. Typical bays in the physical training building were much larger, to accommodate column-free space in dining, aquatic, and gym spaces, Reynolds explains; these bays mostly measured 60 feet by 30 feet through the second floor and were framed with 60-inch-deep cellular beams at 10 feet on center. Thirty-by-thirty-foot bays in the academic building feature W18x50 infill beams with twenty-four ¾-inch-diameter headed shear studs welded 10 feet on center.

Preparing the NYPD for its array of present-day training needs also meant deviating from these norms. Reynolds says the various solutions demanded that fabricator Cives Steel Company produce "wide flanges, heavy shapes you roll only twice a year, some types of tubes, you name it." The building uses 6,000 tons of steel in all, much of it A992 Grade 50 structural steel.

In the cavernous gymnasium, for example, the 180-foot spans comprise 66-inch-deep AESS cellular beams that weigh 290 pounds per foot and feature cambering 10 inches at the center, and they are spaced 30 feet apart perpendicular to the long span. The cellular beams are framed into W40 girders on each end, but not before they were spliced together on the ground in 60-foot-long sections and lifted into place. "The beams also had to be specifically detailed to retain composite action, with a skylight cutting through the center of the span," Reynolds adds, "and this was done by welding a tube to the top flange of the cellular beams and filling the tube with concrete and studs."

While the academy conceals many other custom solutions—Vierendeel trusses support a 90-foot-high visitor entrance, for

Left A seven-story atrium marks the entrance to the eight-story classroom and office building.
Above The main campus building at night. Due to increased structural capacity afforded by the steel structure, the entire campus could operate as a base for emergency response teams during a disaster.

Eric Laignel

Ed Hueber

instance—many others are incorporated into the experience of the architecture. In addition to the gymnasium's mighty roof, special concentric braced frames are visible immediately behind the glazing of Broadway and the atrium; their 20-inch-diameter concrete-filled pipe columns and 16 ½-inch-diameter braces feature both AESS and structural steel. According to Reynolds, an astute visitor will also sense a glaring absence of posts or hangers in the PT building's switchback stair, for which the project team attached cantilever to cantilever to create the impression that it is freely floating. Inspector McGrath remarks that putting structural derring–do on display, combined with the academy's highly dimensional façades (in which panelized aluminum was fluoropolymer-coated on the production line and then anchored into the building slabs) influences outsiders' perception of local government. "We're new to the neighborhood, and we didn't want to build a concrete silo that was solely concerned with structural integrity and counterterrorism."

The head of cadets adds that the surrounding community has responded positively to that sensitivity, while envoys from other police departments are treating the project as a model for emulation. As for Reynolds, the New York City Police Academy is a living textbook. "This project had every kind of structural challenge you could think of," he says. "You rarely see all this in one place, and when I work with younger engineers, we always go back to the Police Academy for reference."

NEW YORK CITY POLICE ACADEMY

Location: **130-30 College Point Blvd., College Point, Queens, NY**
Owner: **NYC Department of Design and Construction**, *New York, NY*
Architect: **Perkins+Will**, *New York, NY*
Consulting Architect: **Michael Fieldman Architects**, *New York, NY*
Structural Engineers: **Silman Associates**, *New York, NY*; **Guy Nordenson and Associates**, *New York, NY*; **Weidlinger Associates**, *New York, NY*
Mechanical Engineer: **WSP Flack + Kurtz**, *New York, NY*
Construction Managers: **STV Construction**, *New York, NY*; **Turner Construction**, *New York, NY*
Structural Steel Fabricator: **Cives Steel Company**, *Gouverneur, NY*
Structural Steel Erector: **Stonebridge Steel Erection**, *South Plainfield, NJ*
Miscellaneous Iron Fabricators and Erectors: **Empire City Iron Works**, *Long Island City, NY*; **Post Road Iron Works, Inc.**, *Greenwich, CT*
Ornamental Metal Fabricator and Erector: **J-Track LLC**, *College Point, NY*
Curtain Wall Fabricator and Erector: **Gamma USA, Inc.**, *New Rochelle, NY*
Metal Deck Erector: **Stonebridge Steel Erection**, *South Plainfield, NJ*