The four-story atrium is capped with a one-story clerestory and contains an Architecturally Exposed Structural Steel stair. The atrium separates the teaching and research wings.

Lehman College Science Facility

A new teaching and research building creates a gateway to the school's science campus with a flexible structural steel design that will accommodate future changes and a four-story atrium that creates informal gathering spaces for students.

LEHMAN COLLEGE IN THE BRONX has a richly textured, 37-acre campus. Founded in 1931 as part of Hunter College, the stone and brick structures of its four original Tudor-Gothic buildings have held up well—and are a refreshing contrast—next to modern and contemporary additions to the school, which include Rafael Viñoly's 1994 Athletics and Physical Education Facility (APEX). It was against this motley but cohesive background that the New York office of Perkins+Will conceived a new 69,000-square-foot science laboratory for Lehman, with classrooms, offices, seminar rooms, labs for different disciplines, and gathering spaces. After deciding on its location in 2002 as part of a facilities master plan, the college completed the new Science Hall and opened it for classes in the Spring of 2013, making it a centerpiece project of CUNY's "Decade of Science." That initiative has seen the University focusing on modernizing or building new facilities to support the latest advances in undergraduate and graduate research, making it easier for students to enter science, math, engineering, and technology fields. It is the first CUNY building to be designed to meet LEED certification, and has achieved a Platinum rating.

Literally creating a link to the old campus, the new L-shaped, four-story science building connects by a third-floor bridge structure to Gillet Hall, one of the original buildings housing Lehman's science programs. The wings of the "L" are actually two independent steel structures above the first floor. Because the majority of the corner slab diaphragms (typically used to brace against wind and seismic forces) at each level were removed to create a soaring glass atrium in the center, structural engineers at Leslie E. Robertson Associates (LERA) introduced a

Left, from top Perkins+Will modified prefabricated greenhouses that perch on the roof of the facility. The long span capability of the steel accommodated the high live load and stringent vibration requirements of a teaching lab. Each atrium level doubles as common space.

Opening spread and facing page: Perkins+Will; this page, top: Phyllis Yip, Lehman College; center and bottom: Perkins+Will

Above A glass-enclosed bridge connects Gillet and the Science Hall, creating a visible link between new and old structures.

seismic joint along one side of the atrium to isolate the two wings.

A final wing of the new science building may yet be constructed as part of a later phase, and Gillet will be renovated. The possibility of future expansion or changes in the program will be made easier because of the steel frame construction. "If you build in concrete and you need to make penetrations through the slab for unplanned things, it's hard," says Robert Goodwin, the architectural design director of Perkins+Will's New York office. "But when you use steel, you have more flexibility for adapting the building for future changes."

In the meantime, the Science Hall is complementary to its older counterparts. "If you walk around the campus, you can see how well the architecture works together; it doesn't fight itself," says Rene Rotolo, assistant vice president for campus planning and facilities. "And that's also what we wanted to achieve with the science facility."

It accomplishes that balance, in part, with a quiet palette and narrow massing. The glass atrium—really, a glorified egress—serves as the hinge between the two wings of the "L" and contains an elegant Architecturally Exposed Structural Steel (AESS) stair, which connects all four floors (stair stringers are comprised of built-up box members that are 18 inches tall by 5 inches wide).

The main AESS column in the atrium is an HSS 12x12x½. The atrium is then capped with a one-story clerestory, where the AESS columns are HSS 8x8x⅜. AESS horizontal beams at the glass perimeter are HSS 12x12x½. AESS members are coated with an intumescent paint for fire protection and then finish-painted. "The stair is probably one of the more expressive parts of the metal construction in the building," says Goodwin. "We exposed things that would ordinarily be concealed. We used it as part of the design intent."

At each main stair level, the architects created informal gathering spaces with seating and whiteboards. These areas take advantage of the daylight streaming through the fritted glass curtain wall and on a recent tour they had even lured students from another department (something that a facility manager says is the norm). "We took something we had to have anyway and turned it into more than what it was," says Goodwin.

Left and facing The curtain wall is a stick built, field glazed system with mostly vertical mullions spanning at least two floors, supported at the edge of slabs. Vented shadow boxes were part of the spandrel conditions of the curtain wall. Extensive decorative metal was used at the exposed areas of the curtain wall, to accentuate its distinction from the masonry plane.

Perkins+Will chose W12 Firetrol columns wrapped in a circular steel tube for use along the main corridors adjacent to the glass curtain wall. Not only did this proprietary fireproofing system provide a pre-fireproofed and pre-enclosed structural column, but also "if we didn't do that, the columns would be fatter," says Goodwin. "Making this frame look as lightweight as possible was really important to us."

The flat, textured surfaces of the rest of the building's facades are calm counterpoints to the Viñoly complex, but also share architectural details with Gillet. Clad in panels of ochre-colored norman brick (hand-laid in a stack bond pattern), with flashing that intentionally aligns them with the window mullions, planar walls jut out subtly from alternating bands of glass and aluminum. The A-frames of off-the-shelf rooftop greenhouses are barely visible from the ground, peeking above the Science Hall's roofline. "Let's keep making it calmer and calmer, and simpler and simpler," says Goodwin of his goal for the design of the building.

The delicate-looking bridge that serves as the visible connection between Gillet and the Science Hall has a 34-foot span, accomplished by its two W24x76 roof beams. Its W10x33 floor beams are suspended from the roof by HSS 3x3 hangers. A slide bearing connection from the bridge to the existing building allows for movement of both along the axis of the bridge, but not parallel to the wall plane of the existing building. Connections from the bridge to the new building restrain relative movement of the bridge and the new building, both in the direction along the bridge axis and parallel to the wall plane of the new building. However, the connections at the new building are also designed to allow for in-plan relative rotational movement of the slab diaphragm of the bridge and the new building slab diaphragm.

Inside the Science Hall, Perkins+Will split the program into teaching and research wings, placing chemistry labs and classrooms in the eastern wing, and pushing offices and more labs to the perimeters of the northern wing. Column spacing in the teaching lab wing is 33 feet. This is 50 percent higher than customary lab column spacing; the long span capability of steel accommodated the high live load and stringent vibration requirements of a teaching lab.

While it's possible to design concrete laboratory buildings, Goodwin says that the steel frame of the Science Hall helps stabilize the moment frames that are necessary to combat any vibrations that could adversely affect lab results. The lateral load resisting system of the superstructure above the first floor is a combination of ordinary moment frames and concentric braced frames. Columns in both of these frame types are W14 wide flange columns. Diagonal braces consist of HSS 8x8, HSS 7x7, and Double Angle 6x4. Moment Frame Beams are W24, W30, and W33. Connections of moment frame beams to columns are comprised of complete joint penetration welds of beam flanges to column flanges, and single plate shear bar web connections.

The Science Hall's two basement levels and the first floor are cast-in-place concrete. The superstructure above the first floor is a structural steel frame supporting composite concrete slabs on metal deck. (In the concept design phase, a structural steel superstructure was compared to cast-in-place concrete and was found to be more economical for the building above grade, says LERA's Rick Zottola. "Structural steel is also the customary superstructure material for buildings of this type in New York City," he says.)

Rotolo, from campus planning and facilities, reported that the students, faculty, and researchers are all finding spaces to collaborate in the new building. "Before, there were individual silos where they weren't interacting," she says. "We deliberately created spaces where researchers from different departments would meet and interact and work together. We created a lot of the spaces in this building that would be ideal for all of our buildings." □

This spread: Perkins+Will

LEHMAN COLLEGE SCIENCE FACILITY

Location: **250 Bedford Park Blvd. W, Bronx, NY**
Owner: **The City University of New York (CUNY)**, *New York, NY*
Developer: **Dormitory Authority of the State of New York (DASNY)**, *New York, NY*
Architect: **Perkins+Will**, *New York, NY*
Structural Engineer: **Leslie E. Robertson Associates**, *New York, NY*
Mechanical Engineer: **Syska Hennessy Group**, *New York, NY*
Construction Manager: **Gilbane**, *New York, NY*
Structural Steel Fabricator: **Metropolitan Steel Industries Inc.**, *Sinking Spring, PA*
Structural Steel Erector: **J.C. Steel Corporation**, *Bohemia, NY*
Metal Deck Erector: **J.C. Steel Corporation**, *Bohemia, NY*