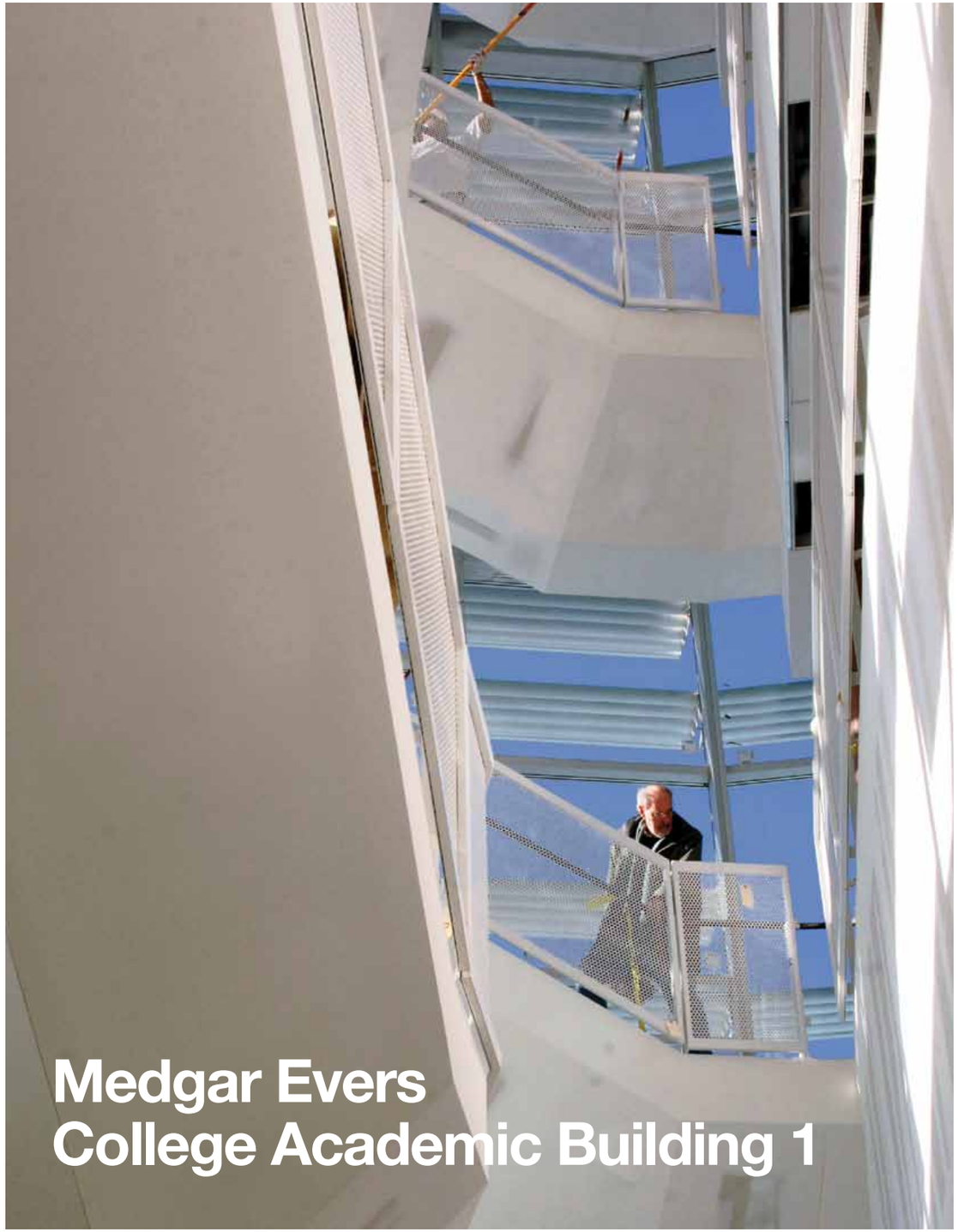


Medgar Evers College Academic Building 1

Ennead Architects

At CUNY's new Brooklyn science building, structural steel expands the core curriculum.

FAR FROM YOUR AVERAGE brick-block campus building, the new Academic Science Building 1 of Medgar Evers College, City University of New York in Brooklyn is an elegant glass and steel centerpiece for a campus poised to become a neighborhood hub. A joint undertaking between the City University of New York/ Dormitory Authority of the State of New York, Ennead Architects (formerly Polshek Partnership), and Leslie E. Roberts Associates, the new six-story academic facility features four teaching laboratories, a hospital simulation room, and five laboratories for molecular biology, anatomy, physiology, microbiology and general biology—flanked by a pair of feature stair cases on its eastern and western facades and capped at the north end by a crystalline floor-to-ceiling glass curtain wall pavilion.

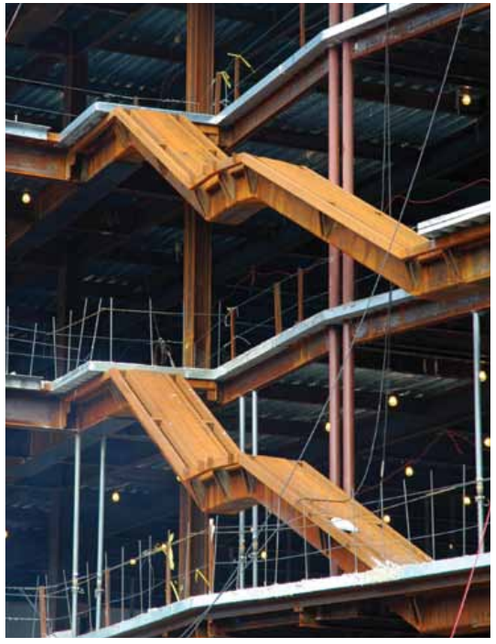
Tasked with opening campus activities up to the community at large, while still fulfilling the exacting functional requirements demanded by the lab facilities, the architects at Ennead turned to structural steel to achieve a balance between form and function. "These days academic buildings have shifted away from fixed spaces," says Todd Schliemann, lead architect for Ennead. "They're a little more flexible and there's a desire to expose the faculty to the students more, so that there's more interaction."

While steel's inherent light weight and malleability are prominent factors in the building's stunning exterior, its long-span properties were key to creating column-free spaces required for teaching labs presented a challenge not only for the present, but for the future as well.

"Laboratories are perhaps best constructed with steel because of changes that may come up down the road," says Schliemann. "Laboratories are very mechanically intensive; there's a lot of services that have to run and supply them. With steel, if in the future you need to run new mechanical services, you can drill anywhere you want. Whereas with concrete you have to avoid the column capitals and all the rebar, which is a much more difficult operation."

"The span of the typical teaching lab member is 37 feet—well above the average 28-foot members used in the framing for ordinary classrooms," says Rick Zotola, structural engineer for LERA. "In this case, they couldn't tolerate having more columns in the space, which made it even more challenging to limit vibrations—something anathema to laboratory work." With long-spanning members of W21x68 ASTM A992, Grade 50 steel, and a floor system of 3 ¼-inch lightweight concrete on a 3-inch metal deck, totaling a 6 ¼-inch slab, the teaching labs on the third floor are designed to limit vibration velocities to 2000 micro inches per second, in accordance with the AISC Steel Design Guide 1.

Steel also played a pivotal role in showcasing the feature stairs on the building's eastern and western facades, the stairs respectively three and four stories. Commonly relegated to secondary structural roles and confined to enclosures, the science building's open feature stairs appear to float like bridges between the floors, further emphasizing



This page The Science Building's crystalline shaped floor-to-ceiling glass curtain wall pavilion opens the campus up the community. The eastern and western floating feature stairs are framed with a single HSS 24 x 22 x ½, resulting in a 36-foot free span between flights.

the project's goal of transparency and community inclusion. "Often times in a multi-storied building you just live in a slice on a floor, unaware that you're part of a larger community," says Schliemann. "These stairs link the whole building together in such a way that you can see people moving through this big volume all the way up the building. It's part psychological and part circulation, but you're aware that you're a part of this bigger academic community."

To achieve the long vertical spans between floor levels without adding too much bulk, the designers framed each flight with a single 36-foot-long HSS 24x2x½ spanning member, bent in plane and elevation, and spliced together at the kink points via full penetration butt welds made in the shop. The stair structure is also used in resisting the effects of wind load on the glass and aluminum curtain wall, which is braced back to the stair by a series of 2 ½-by-10-inch split aluminum tubes that bear on the top of the foundation wall at ground level and laterally brace at the floor slabs and stair stringers. While the floor slab connections are hidden, the curtain wall and stair connections engage the tube mullions via a series of tuning fork-shaped aluminum extrusions with bolted connections that allow for thermal expansion and contraction.

The custom design and fabrication required for the complex glass enclosure of the two-story mixed-used pavilion at the building's northern end hinged on the deft application of a series of structural steel tubes in place of aluminum mullions. "With the

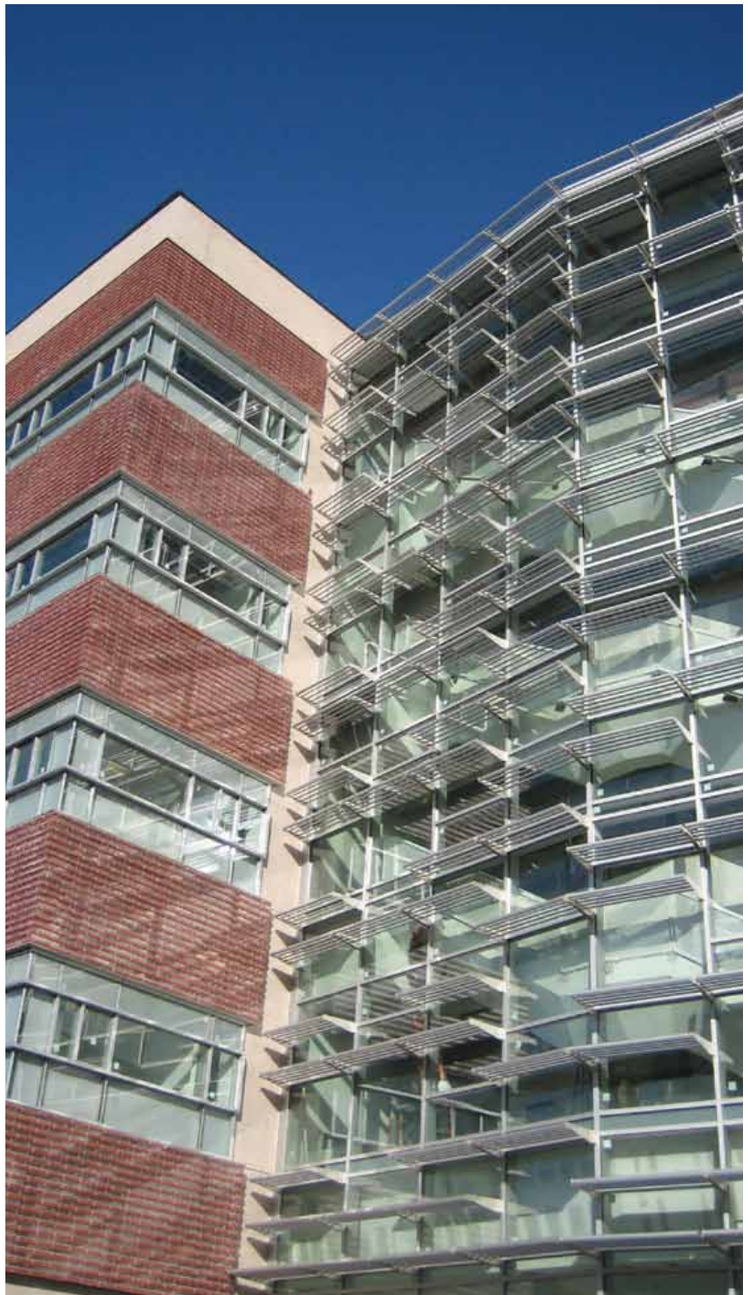
This spread: Leslie E. Robertson Associates

Above The pavilion's folded glass planes are supported by stainless steel gravity and wind load patch fittings projected from a series of HSS members connected to the second-floor building framing and to the roof above.

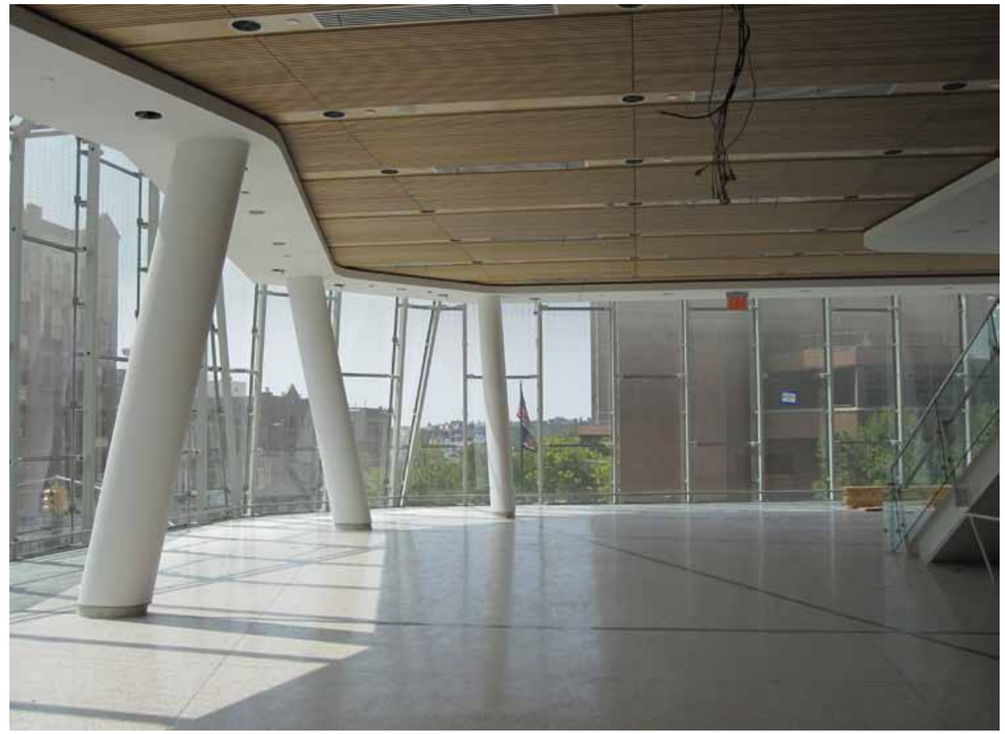
pavilion curtain wall we wanted to have as open and as transparent space as we could; we needed to handle a bit of tricky geometry," says Daniel Stube, Senior Associate with Ennead. "We used a steel support in each place where you would typically have a mullion. Rather than drilling the glass we had fittings go through the joints in the glass to take gravity and lateral loads back to the steel tubes." The pavilion's folded low-e water white glass panes and sloping skylights are supported by stainless steel gravity and wind load patch fittings that project from a series of 29 shop-painted HSS 3x6x½ members, spaced at 5 feet on center, with fixed welded connections to the second floor framing and vertically slotted connections at the roof above.

"By using the steel structure for the curtain wall and holding the glass off of that steel structure, all the geometry, all the trickiness, suddenly became easier," says Stube. "Rather than having the aluminum intersecting on the pane of the glass and creating very complicated joints, the geometry came together in just the thinness of the glass, and that was all reconciled with the sealant joints."

Whether bracing glass, spanning labs, or floating stairs, the choice of steel not only met the designer's needs, but also those of deadline and budget, helping to ensure that Medgar Evers will be a beacon in the community for years to come. "Steel is much more of a carpentry material," says William Clark, associate with Ennead. "You can cut it, bend it, shape it, drill into it—you can work it to meet conditions much more easily than you can concrete." ■



Left Integrated into the curtain wall mullions, an aluminum louver sunscreen system reduces heat gain without requiring the architects to frit the glass, providing the feature stairs with a dynamic play of light and shadow.
Facing The pavilion is framed by six structural columns, which slope through the two-story structure.



Ennead Architects

"Laboratories are perhaps best constructed with steel because of changes that may come up down the road."

Todd Schliemann, Ennead Architects

MEDGAR EVERS COLLEGE ACADEMIC BUILDING 1

Location: **1150 Carroll Street, Brooklyn, NY**
Owner: **City University of New York**, *New York, NY*
Agency: **Dormitory Authority of the State of New York**, *New York, NY*
Architect: **Ennead Architects**, *New York, NY*
Structural Engineer: **Leslie E. Robertson Associates R.L.L.P.**, *New York, NY*
Mechanical Engineer: **Lakhani & Jordan Engineers P.C.**, *New York, NY*
General Contractor or Construction Manager: **The McKissack Group**, *New York, NY*; **Turner Construction**, *New York, NY*
Curtain Wall Consultant: **R.A. Heintges & Associates**, *New York, NY*
Structural Steel Fabricator: **SteelCo**, *Roselle, NJ*
Structural Steel Erector: **Midlantic Erectors Inc.**, *Roselle, NJ*
Miscellaneous Iron Erector: **RISA Management Corp.**, *Westbury, NY*
Ornamental Metal Fabricator and Erector: **RISA Management Corp.**, *Westbury, NY*
Curtain Wall Erector: **Metro-Tech Erectors Corp.**, *Glendale, NY*
Metal Deck Erector: **AC Associates**, *Lyndhurst, NJ*

INSTITUTE-SPONSORED EVENTS

Frank Gehry

Wednesday, November 10, 2010, 3 p.m.: The world-renowned architect will take an unusual break from his busy schedule to discuss his work in a conversation sponsored by the Ornamental Metal Institute of New York. On stage with him will be Julie Iovine, editor of *The Architect's Newspaper*, and Yael Reisner, author of *Architecture and Beauty*. The event will take place in Memorial Hall on Pratt's main Brooklyn campus. For more information, visit **www.ominy.org/events**.

Workshop: Advanced Stainless Steel Architectural Design

On November 9, 2010, leading architectural metal expert Catherine Houska will return for the fourth year in a row to lead an all-day seminar on planning, specification, and execution of innovative stainless steel designs. The event will take place at the AIA New York Chapter Center for Architecture, 536 LaGuardia Place, New York, NY 10012. For more information, visit **www.ominy.org/events**.

Steel Design Competition

The Steel and Ornamental Metal Institutes of New York are sponsoring a student design competition that encourages students to explore innovative ways of creating an original design for loft-style residential living conceived entirely in structural steel, that utilizes innovative systems allowing column-free clear spans with reduced floor thicknesses, and integrated with an energy efficient curtain wall enclosure that emphasizes the frame's slenderness, strength, and transparency in a way desirable for modern loft living. Entries are due June 10, 2011, with winners announced later that month. For more information visit **www.siny.org/events** or **www.ominy.org/events**.

NCSEA Conference Luncheon

The Steel Institute of New York sponsored the featured Friday luncheon at NCSEA 2010 – NEW YORK, the national engineering organization's eighteenth annual conference, held October 1, 2010, in Jersey City, NJ. The Institute engaged David I. Ruby, PE, SE, SECB, founding principal and chairman of Ruby + Associates, Inc., as guest speaker for the luncheon to talk about sustainable design and how the concept of constructability can be the thread that enhances the delivered project. His presentation on the value of introducing collaborative design during early planning and concept development was well received by the 200 engineers in attendance, a tribute to both Ruby and host chapter SEAoNY, the organizers of the conference. The Institute congratulates SEAoNY on its success.

Institute ads appear regularly in New York-area industry publications to let readers know that we can help turn their design aspirations into realities.

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LOCAL UNION NO. 40
International Association of Bridge, Structural Ironworkers & Riggers
451 Park Avenue South
New York, NY 10016
(212) 889-1320

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141-57 Northern Boulevard
Flushing, NY 11354
(718) 939-0600

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89-19 97th Avenue
Ozone Park, NY 11416
(718) 322-1016

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LOCAL UNION NO. 15 & 15-D
International Union of Operating Engineers
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New York, NY 10011
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Steel Institute of New York

The Steel and Ornamental Metal institutes of New York are not-for-profit associations created in 1972 to advance the interests of the structural steel and the architectural, ornamental, and miscellaneous metal construction industries. They serve a geographical area encompassing New York City and the adjacent counties of Nassau, Suffolk, and Westchester. Each sponsors programs to aid architects, engineers, construction managers, and developers in selecting structural systems and architectural metals for optimum building performance. Programs in which the institute is engaged include:

- Consultations extending to the preparation of preliminary design and construction cost analyses for alternative structural systems
- Consultations on design and finishes for bronze, stainless steel, and aluminum for architectural and ornamental ironwork, curtain wall systems, window walls, and metal windows and panels
- Seminars covering structural systems, economy of steel design, curtain wall systems, design, and use of alloys and surface treatments for miscellaneous iron work, and issues important to the construction industry addressed to developers, architects, engineers, construction managers, detailers, and fabricators
- Representation before government bodies and agencies in matters of laws, codes, and regulations affecting the industry and the support of programs that will expand the volume of building construction in the area
- Granting of subsidies to architecture and engineering schools and funding of research programs related to the advancement and growth of the industry
- Publication of Metals in Construction, a magazine dedicated to showcasing building projects in the New York area that feature innovative use of steel

Institute staff are available with information regarding the use of structural steel and architectural metals for your project by contacting institute offices at

211 East 43rd Street, Suite 804
New York, NY 10017
T 212-697-5553/5554
F 212-818-0976

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Architectural and Ornamental Ironworkers
501 West 42nd Street
New York, NY 10036
(212) 594-1662

James Mahoney
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