

The Rockefeller University Collaborative Research Center

Renovations to two laboratories create a bridge between an academic institution's past and future scientific accomplishments.

WHEN THE ROCKEFELLER University began thinking about its future in the next millennium, it turned to two buildings that had helped foster more than 20 Nobel Prize-winning scientists during the past century. The buildings, Theobald Smith Hall, built in 1930, and Flexner Hall, built in 1917, form the historic northeast corner of the 14-acre Manhattan campus. To continue the university's outstanding legacy of achievement, both buildings needed updating of their facilities, as well as of their institutional model.

The university hired New York-based Mitchell/Giurgola Architects to undertake a gut renovation of the obsolete research buildings. Both infrastructure and laboratory spaces were in need of total replacement, but the new labs boast more than high-tech research facilities; bridging the open space between the two buildings—literally and figuratively—is a seven-story atrium designed to facilitate interaction between Rockefeller's scientists. As a symbol of the collaboration that will take place there, this dramatic elliptical atrium, enclosed by a metal and glass curtain wall and, on the interior, by a wooden lattice structure, offers a glimpse of the university's forward-thinking vision while respecting its past accomplishments.

The architects' goal of creating a light-filled space in which scientists can meet and share ideas involved several key design considerations, both practical

and creative. Maintaining a line of sight through the bridge building was important yet complicated because the buildings' longitudinal axes are at right angles to one another. The designers decided the new curtain wall would appear as an extension of Smith, whose original steel framing made removal of its southern face easier, while Flexner still reads as one building, its distinctive masonry bearing walls visible through the new glass facade. "We are very happy with the transparency of the curtain wall," says Jillian Sheedy, senior associate at Mitchell/Giurgola. "From the outdoors one can still experience the elegance of the entire neoclassical facade of the Flexner building."

Working with curtain wall consultant R.A. Heintges & Associates, Mitchell/Giurgola designed the curtain wall with large horizontal spans that create dramatic views toward the entry plaza to the west and the river to the east. The dramatic 17,000-square-foot western portion consists of two different panel systems in order to create the conical wall and the flat portions on either side. To support the conical portion, custom steel framing members were built up by welding together steel plates and finishing the exposed surface before painting. Each member had an access pocket that allowed fastening it to an adjacent mullion or transom. Steel infill plates were added to cover the access pockets and then steel glazing adaptors were welded to

each profile. A gasket system was installed over the glazing adaptors prior to installation of low iron insulating glass with Interpane Ipasol Neutral 73/39 low-e coating.

The adjacent flat walls consist of a unitized aluminum curtain wall system containing the same glass and hung from each floor slab with aluminum anchors. To minimize the appearance of the edge of the floor slab the designers used a painted steel plate instead of concealed spandrel zones.

While the flat panels are supported at each floor, the conical portion is hung from above. Because framing it entirely in concrete would have made it too heavy, much of the rooftop structure from which the curtain wall hangs is framed in steel. This hybrid component supporting the curved facade consists of a horseshoe-shaped concrete ring beam that is cantilevered past the setback exterior columns to the face of the flat wall. There, the ends support a W24x306 steel beam with a depth of 24 inches and a length of 48 feet, the beam being pocketed into each end of the horseshoe. This beam in turn supports a series of 24-inch steel beams cantilevering up to 18 feet to support the outer arc of the curve—a series of W8x35 beams each roll bended to create the curved shape—from which the curtain wall hangs. The back span of each cantilever is supported on the east side of the building by a much lighter W24x62 long-span beam, which frames into a deep concrete beam below.

Mike Lynch, senior associate and project manager with the

The Collaborative Research Center connects Smith (left) and Flexner halls with a seven-story glass enclosed bridge building.

Adam Friedberg



project's structural engineering firm, Severud Associates, says that the primary challenge was to calculate the deflection of each beam individually and collectively in order to minimize movement of glass in the curtain wall. Because snow loads on the roof could put weight on either end of the cantilevered beams, causing them to act like a seesaw, the engineers designed a slotted anchor to attach the curtain wall panels to the slab at each level. Embedded in the floor plate, the architecturally exposed stainless steel connections support the horizontal load and allow bolts to be tightened as the structure inevitably settles during installation, ensuring a watertight facade. "There's nothing special about the materials," says Severud chairman Ed Messina, "just the technique."

Turner, the project's construction manager, worked to avoid

Above Recessed glass handrail shoes hidden by painted aluminum fascias and custom stainless steel railings and stand-offs maintain the stair's weightless appearance.

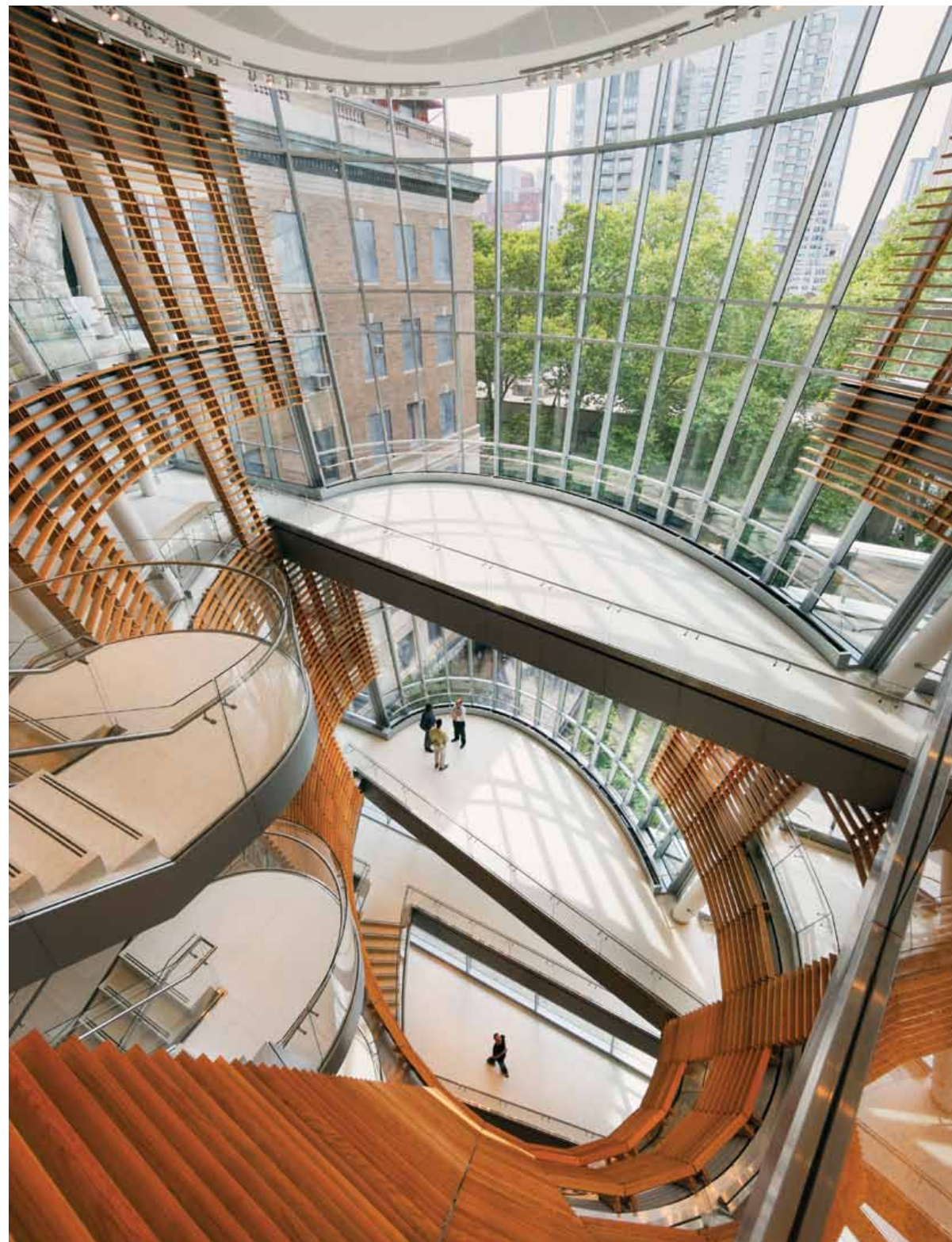
deflection with another special technique. Using a Link Belt 40-ton rough terrain RTC 8040 II crane bearing on footings below the plaza, the team loaded the ellipse panels in a pyramid configuration from the bottom up, ensuring that the steel cantilevers would lower evenly and simultaneously.

Differential movement between the sloped and vertical walls is taken at their interfaces. On the north side of the cone, where balconies interrupt the glass on the second through fifth floors, a slotted double mullion marks the transition between steel curtain wall systems. At the south side, the juncture between the steel and aluminum curtain

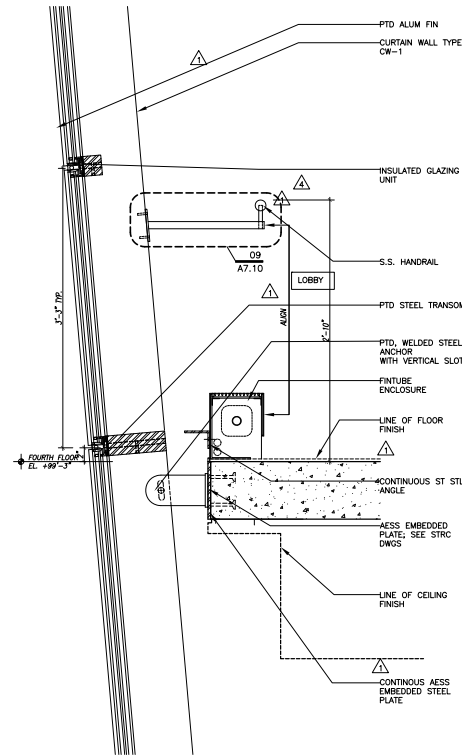
Facing The curved curtain wall completes the building's elliptical shape and creates a visual connection to the campus.

wall systems is marked with two separate mullions, which are linked while accommodating differential movement. Mitchell/Giurgola partner Paul Broches notes "the collaborative design of the hardware components to allow the movement between structure and envelope resulted in elegant details that we were happy to expose." In addition to the engineering team and Heintges, the architects worked with curtain wall consultant Allied Development Corp., curtain wall fabricator Frener & Reifer, and curtain wall erector Gamma USA to realize the complex design.

On the interior, the curtain wall's structure is no less stunning, mirrored by the wooden



Jeff Goldberg/Esto; Facing: Adam Friedberg



Above A section detail of the west curtain wall's curved portion.
Below The structurally exposed slotted stainless steel connection allowed bolts to be tightened as the structure settled, ensuring a watertight facade.



“The collaborative design of the hardware components to allow movement between the structure and the envelope resulted in elegant details that we were happy to expose.”
 Paul Broches, Mitchell/Giurgola Architects



Facing top The eastern projecting conference rooms are glazed with highly transparent insulating glass with low-e coating.
Facing bottom A laboratory mockup of the atrium curtain wall was tested for air and water penetration and structural performance.

latticework that completes the atrium's dynamic form. “The bridge building, of which the atrium is a part, performs two functions,” says Broches. “The square foot-print of the new structure joins the historical lab buildings. The conical ellipse creates visual connections between floors and horizontal views from meeting spaces and casual gathering spaces through the latticework and, finally, beyond the curtain wall to the landscape beyond.”

Inside the atrium scientists have a number of open lounge and meeting spaces and glass-enclosed conference rooms, five of which are all-glass circular enclosures equipped with audio-visual technology. The atrium has an enhanced smoke control system that exceeds the requirements of the NYC Building Code. In the event of a fire, motorized Schuco windows open, allowing rooftop fans to exhaust smoke while drawing fresh air into the building.

Connecting the atrium and the bridge floor levels is a monumental stair, which appears weightless by the incorporation of all-glass guardrails set in metal shoes. Ornamental metal fabricator and erector Champion Metal and Glass had to set each shoe precisely at a 90-degree angle to the stair, ensuring that glass panels lined up perfectly. Recessing the rigid shoes behind the painted aluminum fascias contributed to the stair's weightless appearance. Stainless steel handrails are attached to the 1/2-inch-thick glass with custom stainless steel stand-offs that not only highlight the staircase's form, but also ensure its safety.

Rockefeller's new Collaborative Research Center has already become the highlight of campus tours, a hidden gem in the dense urban landscape thanks to a design and construction process analogous to the collaborative scientific work to be carried out within it. “It is very special to work with a team where all aspects of the construction process come together as well as we experienced at Rockefeller,” says Turner project executive Joe O'Connor. “The owners, the architects, the engineers, the subcontractors, and Turner developed a synergy between our operations and that is the main reason for the project's success.” ■



Mitchell/Giurgola

Turner Construction



Left A slotted double mullion marks the interface between the cone and its north side, where balconies interrupt the glass.

Above The building will connect scientists from a range of disciplines.

THE ROCKEFELLER UNIVERSITY

Location: **504 East 63rd Street, New York, NY**
 Owner: **The Rockefeller University, New York, NY**
 Architect: **Mitchell/Giurgola Architects, LLP, New York, NY**
 Structural Engineer: **Severud Associates, New York, NY**
 Mechanical Engineer: **Bard, Rao + Athanas Consulting Engineers, LLC, New York, NY**
 Construction Manager: **Turner Construction Company, New York, NY**
 Curtain Wall Consultants: **Allied Development Corp., College Point, NY;**
R. A. Heintges & Associates, New York, NY
 Miscellaneous Iron Erector: **HDG Consulting, Douglaston, NY;**
Post Road Iron Works, Greenwich, CT
 Ornamental Metal Fabricator and Erector: **Champion Metal and Glass, Deer Park, NY**
 Curtain Wall Fabricator: **Frener & Reifer America, Long Island City, NY**
 Curtain Wall Erector: **Gamma USA, New York, NY; JEM Architecturals, Bronx, NY**