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ARCHITECT

THE MAGAZINE OF THE AMERICAN INSTITUTE OF ARCHITECTS

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CARNEGIE MELLON UNIVERSITY GATES AND HILLMAN CENTERS

PITTSBURGH, PA.

MACK SCOGIN MERRILL ELAM ARCHITECTS

TEXT BY EDWARD KEEGAN, AIA
PHOTOS BY TIMOTHY HURSLEY

Faced with a hilly site in the center of campus, and a program that required more than 200,000 square feet of classroom, office, laboratory, and study spaces, Mack Scogin Merrill Elam Architects raised the bulk of the new Gates Center for Computer Science and Hillman Center for Future-Generation Technologies above its hillside site, creating a cantilevered complex that seems to hang in midair.



Reaching seven stories tall at the top of the hill, the Gates Center (above, right) and Hillman Center (above, left) are connected by a multistory glass-enclosed bridge. The two centers share a vocabulary of black, diamond-shaped zinc tiles with varied silver-toned window surrounds combined with a more traditional curtainwall.

EARLY 20TH-CENTURY Pittsburgh architect Henry Hornbostel has found kindred spirits in Atlanta-based Mack Scogin and Merrill Elam. Their design for the new Gates Center for Computer Science and Hillman Center for Future-Generation Technologies, on the campus of Carnegie Mellon University, is a 21st-century reinterpretation of the architectural principles that Hornbostel relied on when he drafted the campus master plan and designed its earliest structures starting in 1904.

Before selecting Mack Scogin Merrill Elam Architects for the project, the Carnegie Mellon building committee toured recently completed computer science buildings across the continent. “All the successful ones have had one faculty member take on the project,” School of Computer Science dean Randal E. Bryant says, so professor Guy E. Blelloch was selected to serve as liaison to the architects. “I just wanted a Japanese car,” Bryant recalls — “something nice, economical, that functioned well, and had cupholders in the right places.”

The selection of Scogin, who led the design, and Elam,

who was integrally involved in the process at the firm and with the client, was easy. “We bonded instantly — Mack is an academic,” Bryant says. “Mack taught people to see and understand,” adds Ralph R. Horgan, associate vice provost for campus design and facility development.

The architects were presented with a site and program of considerable complexity. Hornbostel’s master plan — only partially realized — uses two intersecting green spaces (called the Mall and the Cut) to define the campus. The Gates and Hillman Centers (two volumes in one building connected by a multistory glass-enclosed bridge) are located in a valley behind the buildings that front the greens; its grade level is almost 80 feet lower. Placing the 208,000-square-foot structure, designed to be LEED-Gold compliant, on the hilly site was even more difficult due to its subgrade conditions. Sewers, data cabling, and rock confined the buildable area to a comparatively small footprint.

“It was Mack and Merrill’s inspiration to lift the building up from the valley,” Bryant says, creating a

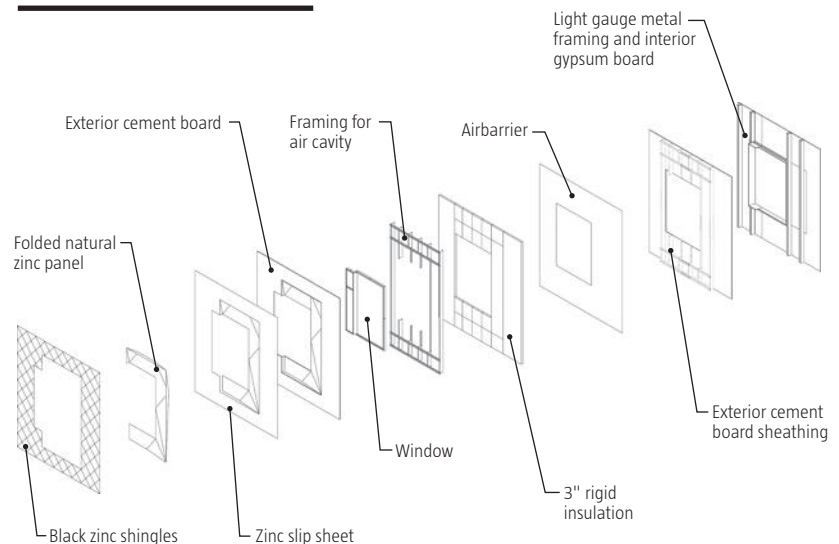


The sixth and seventh floors of the Gates Center (above right) are glass-enclosed and offset from the other floor plates. This glass volume is filled mainly with open project space and a collaborative commons, as well as conference rooms and select faculty offices. The glazing continues on the façades lining the courtyard spaces between the two buildings, creating a visual connection between them.

10-level concrete frame structure with a floor plate that is larger on its upper floors. The lowest two levels are below grade and provide parking. The next five levels are public and link the upper campus to the lower campus. In the Gates Center, a central atrium houses a 650-foot-long spiral walkway called Helix 1; undergraduate classrooms, a café, the dean's suite, offices, and an auditorium are grouped either around—or in—the ramp. This inclined plane's gentle 1 in 20 slope offers a leisurely connection between entrances on multiple levels of the building. The top two floors are mainly devoted to faculty offices.

Beyond the public areas, the core programmed spaces are the faculty offices—nearly 120 individual rooms that the client insisted all have natural light and a view to the outside. “We didn’t think they could do it,” Blleloch says. “It’s like giving students a problem that you know can’t be solved.” Coupling the site’s inability to accommodate much grade-level building and the client’s desire for outward-facing exterior offices gave Scogin and Elam the opportunity to create the building’s distinctive forms. The

Window Surround Axonometric





The varied floor plans (opposite)—hardly one of the nine matches that directly above or below it—create room for courtyards, terraces, and even a small green roof. This terrace (above) between the Gates and Hillman Centers provides not only an outdoor study space, but also a view for the classrooms, offices, and lounge spaces that line it.

upper levels of the Gates Center are larger than the lower ones, placing more square footage where offices can take advantage of better views. The fact that the building mass is divided into two primary volumes—with the Hillman Center to the north and the Gates Center to the south—allowed the architects to incorporate as many nips, tucks, and angles as possible to provide subtly different orientations for the individual faculty offices, and to allow for terraces and other outdoor space.

The exterior of the building is always the last thing Scogin and Elam address—and where they usually get the most creative. “We’ve never had budgets for elegant, fine materials,” Scogin says. They chose a zinc rainscreen for the Gates and Hillman Centers’ cladding—and the durable black shingles in a diamond pattern stand out among the yellow brick buildings of Hornbostel and his successors. The 310 windows are all treated

differently—their consistent size is masked by different surrounds made of silver zinc, which contrasts with the black walls. “It’s an opportunity to individualize and de-institutionalize them,” Scogin says. “I think it’s something Hornbostel would have relished.”

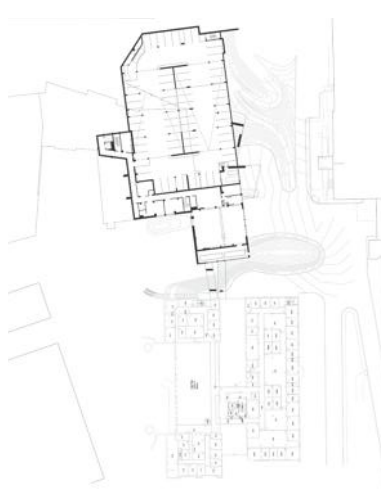
Blelloch lived with the project from programming to architect selection to building completion—and the process of creating the Gates Center for Computer Science and Hillman Center for Future-Generation Technologies helps him link contemporary computer science to architecture.

“There’s a commonality to how you design an algorithm,” Blelloch says. “Computer science is logical, but there’s an aesthetic as well—it has to function, but it also has to look right and be elegant.” The Gates and Hillman Centers are all of these things—and a fitting continuation of Henry Hornbostel’s architectural legacy. □

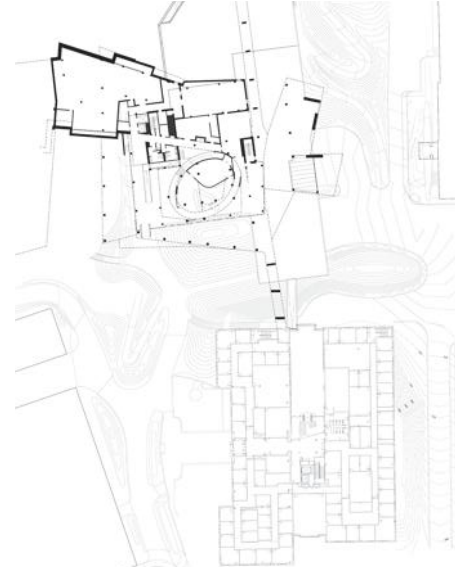
First-Floor Plan



Second-Floor Plan



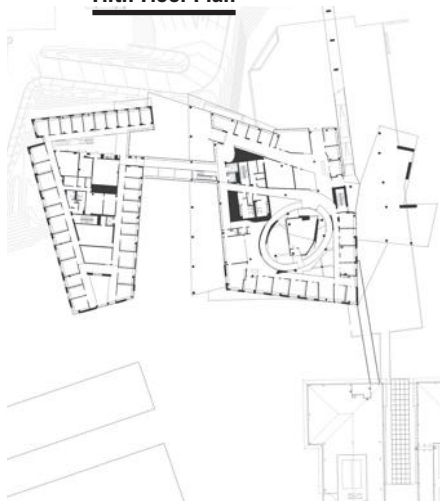
Third-Floor Plan



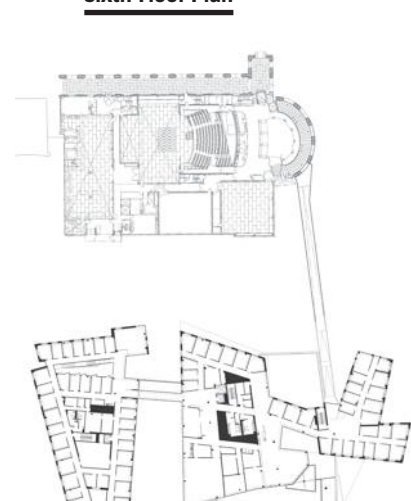
Fourth-Floor Plan



Fifth-Floor Plan



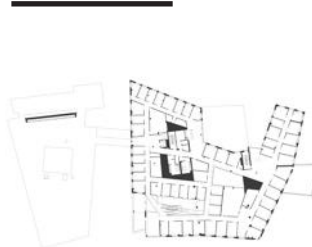
Sixth-Floor Plan



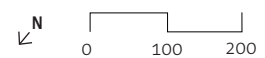
Seventh-Floor Plan



Eighth-Floor Plan



Ninth-Floor Plan





Scogin and Elam placed a premium on natural light and view lines that connect the different floors and programs. Stairwell atria promote interaction between the building users. This one in the Hillman Center (top) connects faculty offices, informal lounge spaces, and a student café.

Other, necessarily enclosed, spaces such as almost 120 faculty offices, classrooms, and laboratory high bays (right) are connected to the rest of the building and campus through extensive use of glazing.



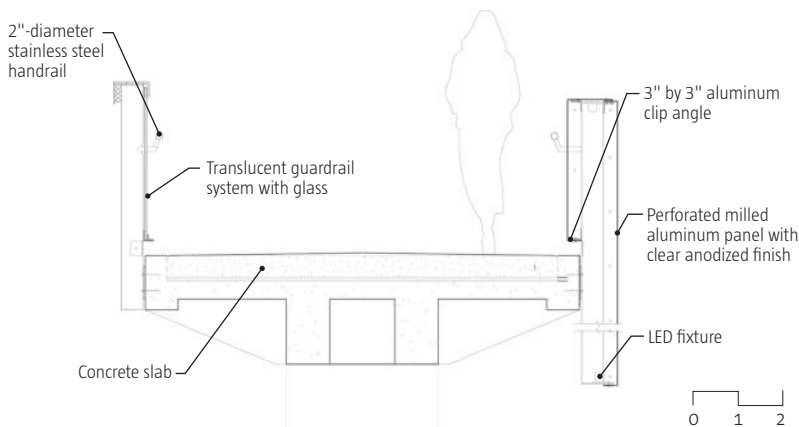
TOP LEFT: © NIC LEHOUX



In the Gates Center, a central 650-foot-long spiral ramp called the Helix 1 visually connects four stories even as it wraps around glass-enclosed classrooms and meeting spaces.



Bridge Section



TOOLBOX

The Randy Pausch Memorial Footbridge

Randy Pausch was an alumnus and noted computer science professor at Carnegie Mellon. His inquisitive approach helped bridge every discipline offered at the university, particularly computer science and the performing arts. Diagnosed with terminal pancreatic cancer, Pausch famously gave what is known as “The Last Lecture” at Carnegie Mellon, resulting in a book of the same name and an oft-downloaded Internet video. At the conclusion of the 2007 lecture, it was announced that the fifth-level bridge that connects the Gates and Hillman Centers to the adjacent Purnell Center for the Arts and to a campus green space known as the Cut, would be named the Randy Pausch Memorial Footbridge.

The bridge's initial design was relatively utilitarian. “How would we change the bridge to honor Randy?” Scogin recalls asking. The answer was to modify the handrail on the south side of the bridge as a metal light box that could provide illumination for people walking on the bridge while also creating a soaring five-stories-in-the-sky light show.

Scogin developed an aluminum cutout design that depicts penguins diving into water. The imagery is based on Pausch's annual selection of a single student as the “first penguin”—that individual who had courageously dived headlong into a task that ultimately proved too great to execute or, as Scogin puts it, the “biggest failure.”

To work out the lighting technology, dean Randal Bryant put the architects in touch with Color Kinetics (now a division of Phillips). One of the company's founders is a Carnegie Mellon alumnus. The collaboration produced a playful element illuminated by LED lights that are, of course, computer controlled. “We always like lighting to add sparkle and energy to the building,” Scogin says.

Project Credits

Project Gates Center for Computer Science and Hillman Center for Future-Generation Technologies, Pittsburgh, Pa.

Client Carnegie Mellon University

Design Architect and Architect of Record Mack Scogin Merrill Elam Architects, Atlanta—Mack Scogin, AIA, Merrill Elam, AIA (principals); Lloyd Bray (senior project architect); Kimberly Shoemaker-Medlock (senior project architect and manager); Alan Locke, Jared Serwer, Jason Hoeft, Clark Tate, Trey Lindsey, Jeff Collins (core project team); Ben Arenberg, Britney Bagby, Cayce Bean, Brian Bell, Misty Boykin, Daniel Cashen, Jacob Coburn, Amanda Crawley, Margaret Fletcher, Francesco Giacobello, Helen Han, Carrie Hunsicker, Patrick Jones, Janna Kauss, Jeff Kemp, Matthew Leach, Gary McGaha, Ted Paxton, Bo Roberts, Dennis Sintic, Barnum Tiller, John Trefry, Anja Turowski, B. Vithayathawornwong, Matt Weaver (project team)

Local Architect Edge studio

Associate Architect Gensler

Interior Designer Mack Scogin Merrill Elam Architects

Mechanical, Plumbing, Structural, Electrical, Acoustical Engineer Arup

Civil and Geotechnical Engineer Civil & Environmental Consultants

Geotechnical Engineer Construction Engineering Consultants

Construction Manager and General Contractor P. J. Dick

Landscape Architect Michael Van Valkenburgh Associates

Lighting Design Arup

Fire Protection, Life Safety, Communications, IT, LEED, A/V, Security Consultant Arup

Specifications Consultant Collective Wisdom

Digital Assets Manager CHBH

Cost Consultant Heery International

Pausch Bridge Lighting Design C & C Lighting

Parking Consultant Tim Haahs

Hardware Consultant Ingersoll Rand Security Technologies

Façade Assessment Wiss, Janny, Elstner Associates

Surveyor Gateway Engineers

Size 208,000 square feet and a 150-car parking garage

Cost \$81 million (construction cost)

Materials and Sources

Acoustical System Baswaphon baswaphon.com

Adhesives, Coatings, and Sealants Dow Corning dowcorning.com; Hilti hilti.com; Tremco tremcosealants.com

Building Management Systems Automated Logic Pittsburgh automatedlogic.com

Carpet Mannington Commercial mannington.com/commercial

Ceilings Armstrong armstrong.com

Glass Oldcastle Building Envelope oldcastlebe.com; Technical Glass Products fireglass.com; Viracon viracon.com

Gypsum Georgia-Pacific gp.com

HVAC Semco semcohvac.com

Insulation Owens Corning owenscorning.com; Dow building.dow.com

Lighting Control Systems Lighting Control & Design lightingcontrols.com

Lighting Delray Lighting delraylighting.com; Designplan Lighting designplan.com;

Gammalux Systems gammalux.com; Gotham gothamlighting.com; Linear

Lighting Corp. lineartg.com; Lithonia Lighting lithonia.com; Lighting Services

lightingservicesinc.com; Mark Architectural Lighting marklighting.com; Peerless

Lighting peerless-lighting.com; Bega bega-us.com; Sistemalux sistemalux.com

Masonry and Stone Williams & Sons Slate & Tile williamsslate.com

Metal VM Zinc vmzinc.com; Rheinzink rheinzink.com

Office Furniture Herman Miller hermanmiller.com

Paint Sherwin-Williams sherwin-williams.com

Plumbing and Water System Crane Plumbing craneplumbing.com; Zurn zurn.com

Public Spaces Furniture Fritz Hansen fritzhanzen.com; Knoll knoll.com;

Ligne Roset ligne-roset-usa.com; Moroso moroso.it; Nienkämper nienkamper.com;

Vitra www.vitra.com; Wilkahn wilkhahn.com

Roofing Siplast siplast.com

Seating Irwin Seating Co. irwinseating.com

Structural System Steel superstructure

Upholstery Fabrics Alcantara alcantara.com; Willow Tex (Izit Junior) izitleather.com;

Knoll Textiles www.knolltextiles.com; Maharam maharam.com;

Kvadrat kvadrat.dk

Walls Georgia-Pacific gp.com; Carlisle Coatings & Waterproofing carlisle-ccw.com;

U.S. Architectural Products (Cem-Aluminum) architecturalproducts.com

Wallcovering Maharam maharam.com; Knoll Textiles www.knolltextiles.com

Windows, Curtainwalls, and Doors Oldcastle Building Envelope oldcastlebe.com