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CONTENT

ON THE COVER
JOSEPH AGUILAR, A SECOND-YEAR STUDENT AT WOODBURY UNIVERSITY'S SCHOOL OF ARCHITECURE. PHOTO BY MARK MAHANEY.

→ ONLINE

There's more online at architectmagazine.com:

Blaine Brownell's Mind & Matter blog looks at products and materials in development and on the market.

Aaron Betsky's Beyond Buildings blog comments on the impact that design has on our society and culture.

And there are constant updates: breaking news, new products, slide shows, extra images of the projects in the issue, and more ...

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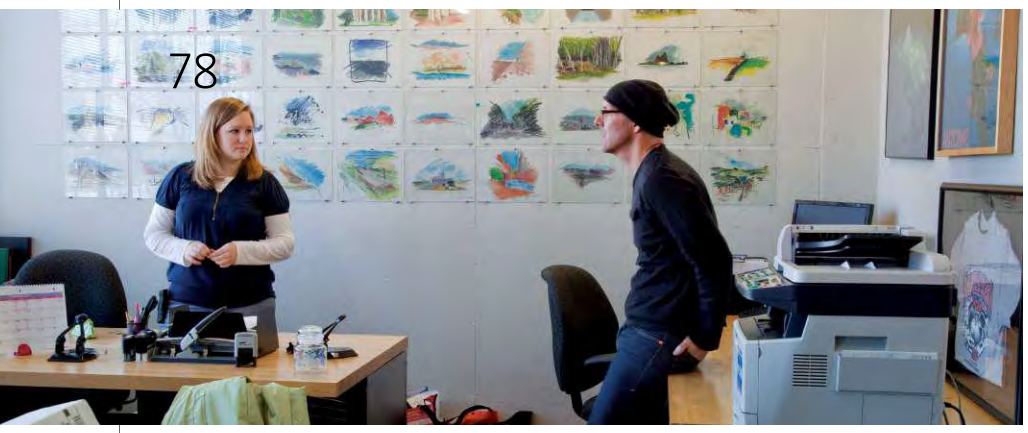

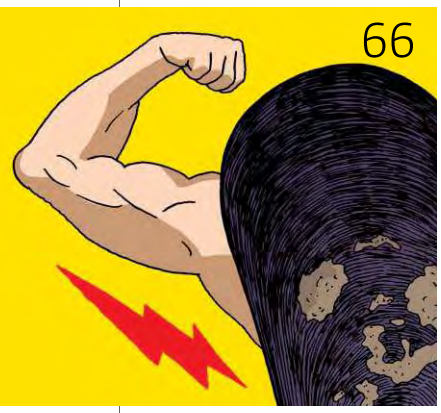

PREVIOUS PAGE, CLOCKWISE FROM LEFT: MARK MAHANEY; ELIZABETH FELICELLA; KATE JOYCE STUDIOS
THIS PAGE, CLOCKWISE FROM TOP: TIMOTHY HURSLEY; COURTESY ACE ARCHITECTS; PETER ARKLE

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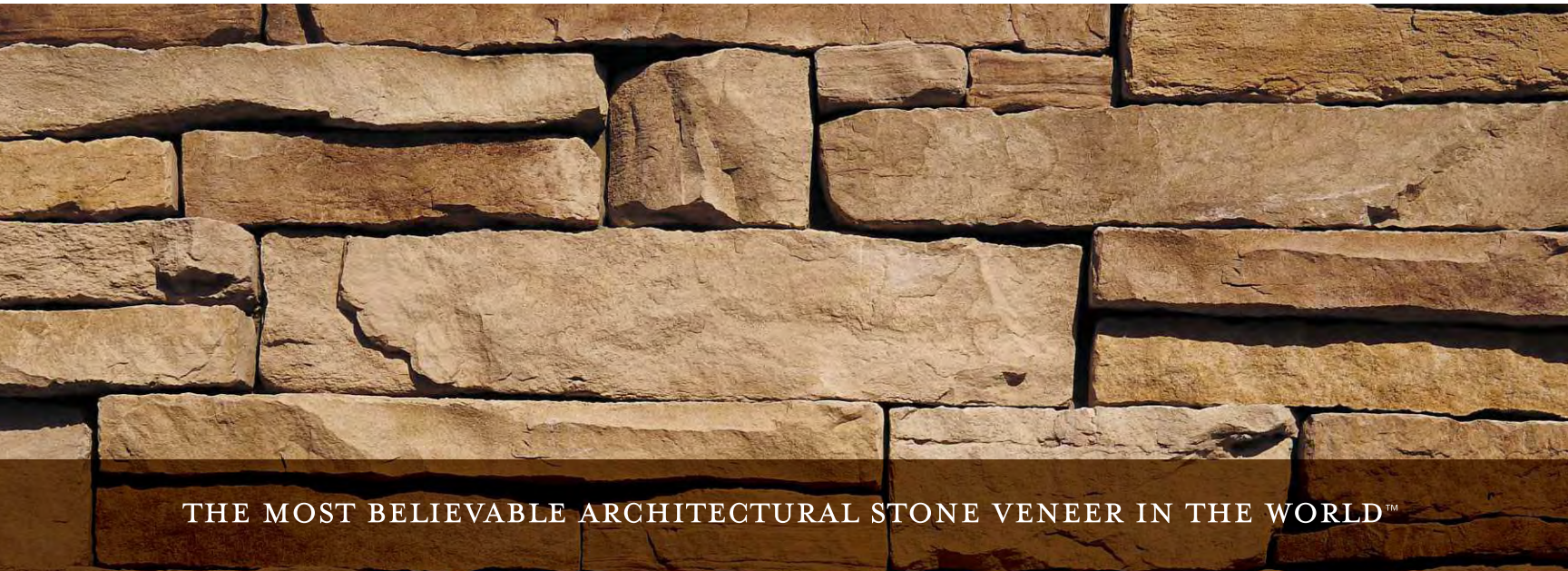

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ASTROTURF, ANYONE?

I FIND IT UNCONSCIONABLE THAT THE PARK SERVICE ALLOWS CELEBRITIES SUCH AS GLENN BECK AND JON STEWART TO STAGE MASSIVE RALLIES ON THE MALL WHILE EIGHTY-SIXING AN EDUCATIONAL PROGRAM THAT EXEMPLIFIES THE OBAMA ADMINISTRATION'S CLEAN-ENERGY GOALS.

THE NATIONAL MALL in Washington, D.C., is America's front yard, or so the saying goes. The museums and special events draw some 25 million visitors a year. With that much foot traffic, and a longtime congressional policy of deferred maintenance, it should come as no surprise that these days the Mall looks less like a manicured lawn and more like a back alley.

So it would seem like a good thing that U.S. secretary of the interior Ken Salazar and national park service director Jon Jarvis unveiled an improvement plan for the Mall last November. But ironically, their good intentions have undermined one of the government's most important sustainable-design initiatives. Salazar and Jarvis' plan has yet to be funded or scheduled, yet in early January the Park Service used it as an excuse to revoke the Solar Decathlon's permit to use the Mall this fall.

The biennial Decathlon is an initiative of the U.S. Department of Energy, in which teams of students from universities around the world design technologically sophisticated green model homes. Every other fall, the homes are erected on the Mall and opened for viewing.

The program has proved its worth on many levels: Students gain hands-on experience, manufacturers a rigorous testing ground, and the public and policy makers an object lesson about architecture's vast capacity to save energy and help the environment. Four successive Decathlons have occurred on the Mall, on the axis between the Capitol and the Lincoln Memorial. But no longer.

For a while, bloggers circulated a rumor that the Decathlon would move to a parking lot at National Harbor, a mixed-use development located miles away from the Mall in Maryland—or even to another city altogether.

Finally, on Feb. 24, the Park Service backtracked slightly and granted permission for the Decathlon to take place at West Potomac Park, on a spit of land between the Potomac River and the Tidal Basin just north of the Jefferson Memorial. Technically the new site is part of the Mall, but in reality it is too far from downtown Washington, D.C., and has far less symbolic resonance than the original location.

The Association of Collegiate Schools of Architecture (ACSA) is understandably outraged. "West Potomac Park does not equal the National Mall," says ACSA president and University of Washington architecture dean Daniel Friedman. "The success and stature of the Solar Decathlon program reflects the kind of visibility only the National Mall can provide." ACSA even suggested making post-event site restoration a requirement for participants. To no avail.

I find it unconscionable that the Park Service, a steward of America's natural environment, allows celebrities such as Glenn Beck and Jon Stewart to stage massive rallies on the Mall while eighty-sixing an educational program that exemplifies the Obama administration's clean-energy goals. Meanwhile, the Park Service has permitted the Library of Congress to use the Mall for its 2011 National Book Festival, an event that attracts more than 100,000 people, during a weekend previously reserved for the Decathlon. The logic of all this escapes me.

It's difficult to argue against the need to restore dignity to the Mall in the form of improved maintenance and services. The grass should be green and healthy, and the restrooms plentiful. But why should those goals preclude active use of the space, by real, live human beings, especially when they promise to clean up after themselves? The Mall is lined with museums whose guiding principle is "look, don't touch." The Mall, by contrast, should operate in an aggressively hands-on fashion, in keeping with the inclusive design of the American republic.

Since architect Pierre L'Enfant drew up his "Plan for the City of Washington" in 1791, the Mall and its uses have evolved dramatically, in keeping with changing necessity, resources, design trends, and definitions of national identity. But in recent years the Park Service, the National Capital Planning Commission, and other groups have adopted an essentially reactionary position where the Mall is concerned, attempting to lock it into its current configuration—the fewer changes, the better.

Where's the value in rewriting history, in saying that the Mall in its current form is how the Mall always has been, and always should be? It's like arguing that the U.S. Constitution doesn't need amendments. The Mall deserves a noble, vibrant future, not prescriptive preservation in a fictitious historical condition.

The Park Service plan reflects this limited vision. Out of a $600 million budget, 75 percent will go to repairs. The repairs are necessary, but so too are amendments—many of them, over time, in the form of spirited events, art, and architecture. The Mall may be sacred ground, but it shouldn't be inviolable.

Why not wed the goals of the Decathlon with the Park Service's requirements for new facilities? The students could be tasked with designing restrooms, band shells, food kiosks, and the like. These improvements could last for months or years, rather than a few weeks. Like America's great, ongoing experiment in representative government, the innovative architecture of the Solar Decathlon could serve immediate needs on the Mall—and, in the process, excite millions of minds.

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LETTERS

A CLOCKWORK SHADE, February 2011

I just read the article and I must say it was the most well-written, comprehensive, and technically accurate piece I've seen to date on our technologies—bravo! Thank you for the effort you put in to make this possible. *Craig Holland, Hoberman Associates, New York City*

JANUARY 2011

Congratulations on your work over the last years on the magazine—every issue is better than the last. *Mark Oberholzer, AIA, Austin, Texas*

The cover proclaimed "Architecture in an Age of Transformation." I cannot tell you how disappointed I was with the lack of serious thinking in news articles, the fame-game featurettes with big, expensive buildings, and posh self-seeking corporate advertising. It was *Architectural Record* all over again. AIA publications should be about people or firms and expanding the potential earning power of all AIA members rather than inflating egos of prima donnas. What the AIA and schools of architecture need to embrace is entrepreneurship and value innovation; in America, people vote with their dollars. When a profession ignores clients and serves itself, customers vote no confidence and profits fail. ARCHITECT magazine and the AIA need to reward experimentation and thinking outside of the box. P.S. I liked the article on Samitaur Tower. *Mork Soroko, AIA, Tallahassee, Fla.*

U.S. LAND PORT OF ENTRY, VAN BUREN, MAINE, February 2011

Often, the online comments section becomes the launching point for a conversation about the story topic. Below are comments about one of the 2011 P/A Award winners, the U.S. Land Port of Entry in Van Buren, Maine, by Julie Snow Architects:

Feb. 20, 2011—12:16 a.m.

It's remarkable that something as mundane and functional as a border station could be so elegant. In this case, the glass also maximizes views for security personnel. The expression of structure is reminiscent of '60s modernist federal buildings. Unfortunately, many of these did not age well. I perceive a softness to this design, however, in part from the openings in the canopy as well as the richness of the elevation with its complex and layered patterning that suggests that this project will fare better in the long run. Let's hope the final product lives up to the vision set forth in these renderings and diagrams.

Feb. 20, 2011—12:47 a.m.

I'm so happy to see that the federal government is supporting design like this. It reminds me of the embassies the U.S.A. built several generations ago. Sadly, between then and now, it seems the government wasn't interested in design, and we can see the unfortunate results all around the country. It's great to see that we've come full circle!

Correction

In the January 2011 issue, we erroneously listed Braulio Baptista of Zimmer Gunsul Frasca Architects as a member of the AIA. We regret the error.

→ Want to be part of the conversation? Go to architectmagazine.com. You can comment anonymously or make yourself known to the rest of our community. All letters and online comments may be edited for length, content, grammar, and style.

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Contributors

Kriston Capps

Associate Editor

Kriston Capps joined the staff of ARCHITECT in December 2010. After graduating from the University of Texas at Austin with a bachelor's degree in English and art history, Capps moved to the District of Columbia, where he has written about art and architecture for the past eight years. He has contributed to publications including *Artforum*, the *Washington City Paper*, and *The Washington Post*. Capps resides in the Trinidad neighborhood of Northeast Washington with his dog, and lives for Texas Longhorns football. In this issue, he writes about the growing number of architecture schools that offer certificates in sustainable design (page 44).

Michael Todaro

Graphic Designer

Michael Todaro joined the magazine staff in August 2010. He received a B.F.A. from West Virginia University in 2009 and, after graduation, worked a stint as the sole graphic and Web designer at an accounting firm before coming to ARCHITECT. A native of Rockville, Md., Todaro plays softball and football and enjoys working on old cars: In the past, he's tinkered with a '65 Mustang and a '67 Camaro. Todaro commissions photo shoots and illustrations for ARCHITECT, and lays out front-of-book articles.

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NEWSWIRE

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THE OBSERVER (UK)

Tallest skyscraper by Briton tops out

Sir Terry Farrell's Kingkey Finance Tower, in Shenzhen, China, topped out at 1,440 feet. It's the tallest skyscraper by a British architect and the eighth-tallest building in the world.

CORRECTIONAL NEWS

Net-zero historic landmark

Westlake Reed Leskosky's plans for the Wayne Aspinall Federal Building and Courthouse would make it the first net-zero building on the National Register of Historic Places.

OTTAWA CITIZEN (ONTARIO, CANADA)

Cardinal to donate archives

Douglas Cardinal, whose built projects include the Canadian Museum of Civilization (above), will donate his archives from 1984 to the present to Carleton University.

AIA 2011 Latrobe Prize Given for "Public Interest Practices" Study

COLLEGE OF FELLOWS AWARDS $100,000 BIENNIAL GRANT TO PROPOSAL THAT WILL EXAMINE THE NEEDS THAT PUBLIC-INTEREST PRACTICES CAN ADDRESS, HOW SUCH PRACTICES OPERATE, AND THE STEPS NECESSARY FOR MAKING PUBLIC-INTEREST WORK A SIGNIFICANT SEGMENT OF ARCHITECTURAL PRACTICE.

THE AIA'S 2011 LATROBE PRIZE has been awarded to a team investigating "Public Interest Practice in Architecture." The $100,000 grant goes to Bryan Bell, executive director of Design Corps; Roberta Feldman, professor at the University of Illinois at Chicago; Sergio Palleroni, senior fellow for the Institute for Sustainable Solutions at Portland State University; and David Perkes, AIA, director of Gulf Coast Community Design Studio at Mississippi State University. The team "will investigate the needs that can be addressed by public interest practices and the variety of ways that public interest practices are operating," according to the AIA.

The group sees opportunity in the current high unemployment within the profession—and is quite challenging in its project abstract. "In its current state, the field of architecture would benefit and be more useful if a significant segment reconfigured from client-driven practices to a needs-driven segment of architectural practice," they write. The group intends to develop a needs-driven practice guide to facilitate this transition. "At a time when billions of people around the world have a dire need for architectural services without the ability to pay the fees, the development of a public-interest practice manual may be one of the most urgent tasks facing the profession," jury chair Thomas Fisher, Assoc. AIA, said in a press release. EDWARD KEEGAN, AIA

2011 Latrobe Prize Jury

Thomas Fisher, Assoc. AIA, University of Minnesota; Peter Bohlin, FAIA, Bohlin Cywinski Jackson; Shelia Kennedy, AIA, Kennedy Violich Architects; Henry Koffman, University of Southern California; Sharon Sutton, FAIA, University of Washington; Chet Widom, FAIA, vice chancellor, College of Fellows; Norman Koonce, FAIA, bursar, College of Fellows.

JANUARY 2011 ARCHITECTURE BILLINGS INDEX

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- ↑ 54.6 commercial
- ↑ 51.3 institutional
- ↑ 48.7 mixed practice
- ↓ 53.7 multifamily residential

SOURCE: AIA

THE NEW YORK TIMES

It's Interboro for MoMA's PS1

Brooklyn, N.Y.'s Interboro Partners will design this year's transformation of the MoMA PS 1 courtyard. The firm plans to use materials they can donate to local nonprofits at summer's end.

THE KANSAS CITY STAR

Historic trust v. K.C. office building

National Trust for Historic Preservation president Stephanie Meeks says a proposed office tower threatens the character of Kansas City, Mo.'s Country Club Plaza (above), built in the 1920s.

ASBURY PARK PRESS (NJ)

Planning continues for Saarinen's Bell Labs

Somerset Development and Holmel, N.J., are near accord on a plan for the former Bell Labs complex (above) that would create 30 residential units, not the hundreds Somerset first proposed.

UL Environment Acquires Greenguard Certification Programs

AIR QUALITY SCIENCES AND GREENGUARD WILL RETAIN INDUSTRYWIDE, GLOBALLY KNOWN NAMES.

UL ENVIRONMENT, A SUBSIDIARY of the product-safety-certification company Underwriters Laboratories (UL), has acquired Air Quality Sciences (AQS) and its certifying body, the Greenguard Environmental Institute. Under the acquisition, Greenguard will retain its name, and its certification program names will remain unchanged as well.

AQS aims to help product manufacturers identify the chemicals emitted from products through the use of testing laboratories, while Greenguard certification aims to help manufacturers communicate a sustainability message to the marketplace regarding low chemical emissions. Its marketing efforts include the Greenguard certification mark and Greenguard product guide.

"This acquisition combines AQS's world-class technology and expertise, as well as Greenguard's brand recognition and scientific rigor, with UL's trusted history of standards development, testing, and compliance to create a more comprehensive solution for testing and certification," says Steve Wenc, president of UL Environment. "Together, we'll help consumers, regulators, and other interested parties make informed product purchases by providing clarity around indoor air quality claims."

UL entered the environmental realm in 2009 with the launch of UL Environment, which aims to help establish new definitions of safety and aid manufacturers in differentiating environmentally superior products. Its testing efforts also address product emissions and indoor air quality certification. KATIE WEEKS

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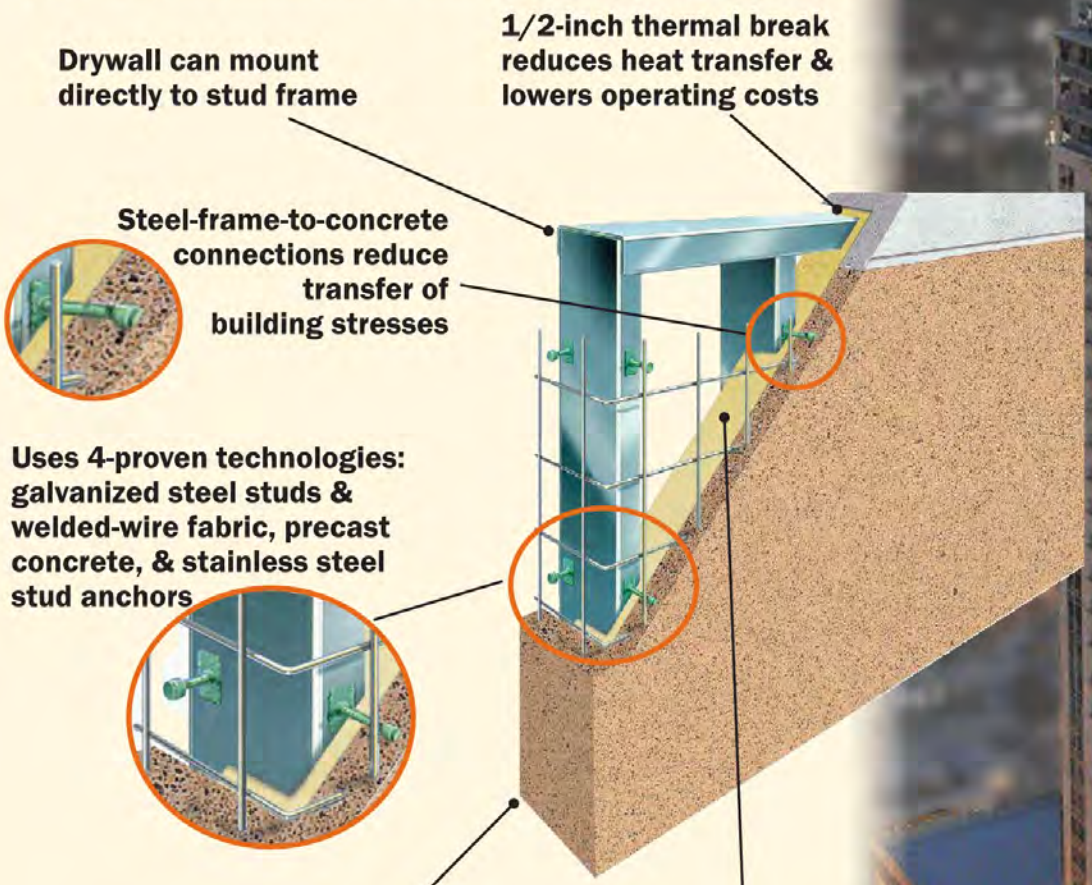

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AIAVOICES

WYCK KNOX, AIA, LEED AP, OF VMDO ARCHITECTS ON GREENING SCHOOLS AND CURRICULA

There's clearly a demand growing all across the country for green schools. That means different things in different jurisdictions, considering the politics of green. But everyone wants a healthy environment for their kids, and there's greater recognition that high-performance buildings produce high-performance students.

Unfortunately, a lot of facilities in this country don't meet basic needs. People often say they don't have the resources to "go green." Does it cost more to build green? No, you can build green at any price point. There's a lot of simple, low-hanging fruit. A top priority of a sustainable school is indoor air quality and light, something that can be achieved at any price point. At Manassas Park Elementary School, in Virginia [a Title 1 school that earned an AIA 2010 COTE Award], we made use of Solatubes, which were very inexpensive and haven't leaked, despite record snowfalls. They provide light all day because of their unique parabolic shape.

Generally speaking, there are three dimensions to a green school. There's a healthy school, which is about making sure it's nontoxic. There's a high-performance school that conserves energy and water (and money). The third aspect is building-as-teaching-tool.

The building itself can become a lesson plan, providing endless possibilities to our talented teachers. The way Manassas Park Elementary works is what you might expect from a high school. The kids don't stay in one room all day and they change classes frequently so there's a lot of movement in the building. There are three outdoor classrooms—two courtyards oriented to get full southern sun and a main outdoor classroom that doubles as a bioretention area. There was a large stormwater pipe running through the site and we decided to daylight it so that when there's a big storm, the teacher can take a class out there and see firsthand how drainage works.

Almost everyone learns better by doing. If the building becomes a teachable place, students can see the impact of their actions firsthand. Manassas Park has three academic "houses," or wings. A dashboard tracks energy use for each house but was giving faulty data for one house, causing its energy use to appear abnormally higher than the others. When the principal challenged those students to do better, a fourth grader responded, "It's not fair—we're the southernmost building and we're getting more solar heat gain than the others!" I think his response speaks volumes to how engaged our kids can be.

If a school doesn't actively promote stewardship of the world around it, I'm not sure it counts as a green school. Law schools and medical schools produce lawyers and doctors, so what should it mean to graduate from a green school? *As told to William Richards.* AIA

To hear more Voices, visit architectmagazine.com/AIA.

AIANOW

ACROSS THE INSTITUTE

ARIZONA

Arizona Architects Start a Dialogue

AIA Arizona recently launched its new peer-reviewed magazine, *AIA Forum/Arizona*, a publication that encourages discussion between architects, designers, and the larger community.

↗ Learn more at aia-arizona.org.

TEXAS

New Bayfront in Corpus Christi

AIA Corpus Christi has set its sights on Destination Bayfront. Working with the community, the AIA is supporting a master plan for urban growth and a signature waterfront along the city's underutilized Bayfront area. This placemaking effort focuses on creating sub-places within the area, such as cafés, playgrounds, beach activity venues, and outdoor performance spaces, which can evolve with the community while also enhancing the image of downtown Corpus Christi.

↗ Learn more at destinationbayfront.org.

PENNSYLVANIA

A Regional Solution for Route 51

AIA Pittsburgh, along with an AIA Sustainable Design Assessment Team (SDAT), spearheaded charrettes last October around improving the busy Route 51 corridor, a roadway that impacts multiple states. The program will help implement changes to land-scaping, flood management, and other sustainability issues. In October 2011, SDAT will return to support the project's continued progress.

NEW YORK

Design's Next Generation

A new Architecture and Design Academy at the public International Preparatory School in Buffalo offers students in grades 9–12 a design-oriented education. Supported by AIA Buffalo/Western New York, the academy has enrolled its inaugural class and will prepare it for a higher education in architecture.

↗ Learn more at aiabuffalowny.org.

FLORIDA

Exploring Orlando

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AIAKNOWLEDGE

EXPLORING THE ECOLOGY OF REGIONAL DESIGN IN NEW ORLEANS

ILLUSTRATION: BARRY FALLS

NO SETTING SEEMS MORE APPROPRIATE FOR EXPLORING THE ecology of regional design—the theme of the AIA 2011 Convention—than New Orleans, where Hurricane Katrina and the Gulf oil spill have combined to bring climate, energy, and sustainability to the epicenter of the architectural conscience.

The convention's slate of speakers opens this year with a keynote by Thomas Friedman, three-time Pulitzer Prize winner and *The New York Times* foreign affairs columnist. Friedman has written extensively about how we live in a new "energy-climate era" that will require clean-technology breakthroughs and infrastructure investments. Regional design approaches are a major ingredient in building the type of green economy critical for sustaining economic growth that Friedman advocates in his latest book, *Hot, Flat, and Crowded*.

While New Orleans can relate perhaps better than any other city to this year's theme, AIA Annual Conference Chair Marion Fowlkes, FAIA, LEED AP, principal of Nashville's Centric Architecture, believes that "regional design and ecology is important in any major city in the United States of any size."

"Most architects live and work in an urban environment—and how their hub city fits into the greater region means looking at the bigger picture, whether it's here in Nashville, where I work, or any other town," Fowlkes says. "Architects have an obligation to participate in the betterment of their own communities, and we want to lead that type of discussion in New Orleans."

The three-day learning community planned for the convention includes a wide range of sessions addressing how architects help communities work across disciplines and across geographic, cultural, and political divides to coalesce around a sustainable vision of place. The closing keynote session on Saturday will be a panel with New Orleans Mayor Mitch Landrieu in dialogue with other urban mayors, including former Honolulu mayor Jeremy Harris, about how to achieve an implementable vision for the city of the future. While Landrieu is focused on transforming New Orleans, Harris spearheaded 21st Century Oahu, a community-based visioning program where hundreds of public safety, environment, transportation, cultural, and recreation construction projects were completed while empowering neighborhoods to control their own development projects.

Another conference session, "The Master Plan for New Orleans: Livability, Opportunity, and Sustainability in the 21st Century," will showcase the intensive one-year process that involved 5,000 participants in a new master plan for the city. While many sessions draw on New Orleans, lessons learned will be applicable wherever an architect practices.

Design Salons (called Design Forums in the past) will complement topics introduced in general sessions with programs featuring recognized leaders in sustainable-community building. One Design Salon will be a conversation between Hillary Brown, AIA, LEED AP, principal of New York City's New Public Works, and Bloomberg News commentator James S. Russell, FAIA.

> "Architects have an obligation to participate in the betterment of their own communities."

With more than 130 sessions, 32 preconference workshops, and 37 local tours, the convention will offer sunrise-to-sunset learning opportunities along with the return of the CE Theatre. At the heart of the Hall is L'Avenue, a 700-foot New Orleans–inspired avenue that will be the AIA's Main Street, with public spaces for interaction and education. The Tulane School of Architecture URBANbuild program, where architecture students design and produce affordable city housing, will recycle materials from L'Avenue.

With so many forward-thinking professionals on the cutting edge of design, leadership, and collaboration soon to descend on New Orleans, the city and its environs are destined to become a learning laboratory for ways to respond to and improve upon the livability, environmental quality, and identity of the regions in which architects practice. AIA

For a complete schedule of convention conferences, workshops, and events, visit *convention.aia.org*.

Written by Mike Singer.

Learning by Design

Philadelphia's Charter High School for Architecture and Design forged a new kind of design-based curriculum in public schools when it opened more than a decade ago. Is the experiment working?

DIANA LIND

IN 1999, WHEN PHILADELPHIA HOSTED THE AIA NATIONAL Convention, the local chapter saw an opportunity to address two challenges impacting the architecture profession and American cities: the staggering lack of minority architects and the unfortunate state of urban public schools. Using Philadelphia as an example, could the AIA do something to repair this situation for the benefit of the profession and the city?

The Charter High School for Architecture and Design (CHAD) is an attempt to answer that question. Launched in 1999 in collaboration with local educators as part of AIA Philadelphia's Legacy 2000 Project, CHAD's mission is to educate the urban poor (half its students are on welfare and 90 percent qualify for free or reduced-price lunches) and use design instruction to achieve that goal. By introducing students to the design process across the school's curriculum—exposing them to the building industry and urban planning issues, and calling attention to a set of professions they might not otherwise consider—AIA Philadelphia Executive Director John Claypool, AIA, says that CHAD has increased the number of students considering careers in architecture. "Any way that children can be encouraged to look at this as a career choice is a good thing for the profession and for the nation," Claypool says.

So has the school succeeded? Over a decade since its opening, CHAD now sends more than 90 percent of its students to college—a particular triumph in a city with a 60 percent graduation rate. CHAD's principal, Peter Kountz, attributes this in part to the school's unique curriculum. "The architecture and design curriculum is really important—not necessarily because it's architecture and design but because it liberates the students. It's a source of great freedom and inventiveness," he says.

Since CHAD began, the concept of design-based public education has taken root. CHAD's method of using architecture and design as a vehicle for a new type of teaching and learning has spurred similar programs around the country, with a burgeoning national trend of including more design instruction in public school. Adam Jarvi, Assoc. AIA, co-founder of Design Education Modus Operandi (D.E.M.O.) in Minneapolis, an organization that helps craft design-based learning for both students and teachers, calls the advantage of this kind of curriculum "structured openness."

"Teachers know there's something to having a more open approach, but not too open. The design process straddles that middle ground; it also has a certain rigor to it," Jarvi says. As a result, "A lot of teachers are looking for this kind of instruction."

Sandy Speicher, head of the Design for Learning domain at IDEO, a global design consultancy, extols design education because its principles are often at the nexus of so-called "21st-century skills."

"The process of design is inherently a process of learning," Speicher says. "It's well documented that the jobs of the future require the skills to collaborate, to learn quickly, to be adaptable, creative, [and have a] facility with technology. Learning through the design process is a way to teach all those skills and also how to lead, follow, how to interpret and synthesize."

Architecture's creativity is what attracted Sean Canty, a 2005 CHAD graduate, to a career in the field. Growing up playing piano and dancing, Canty knew he wanted "to do something creative." CHAD helped define that interest as architecture. The school's location, just a block from Philadelphia's historic core, helped him appreciate the role of architecture in the nation's history. "That a building could carry so much meaning in a physical form was really interesting to me," he says. But it was an internship at KSS Architects the summer of his sophomore year, and "seeing the production and excitement of

Left: CHAD students learn the creative and the technical sides of design. Below: Team building and individual instruction.

PHOTOS: MARK GARVIN

the studio," that sold him and has nurtured a long-lasting relationship with architect mentors.

A feedback loop of support from the architecture community is essential to CHAD and similar schools. AIA Philadelphia continues to raise $10,000 annually for CHAD; members of the design and construction industry sit on the board; and local firms such as EwingCole, Venturi, Scott Brown and Associates, and Blackney Hayes Architects have donated time and money. But students are more likely to recognize the community's impact through its ACE (architecture, construction, engineering) mentorship program, or the annual Spooktacular, in which young local architects and CHAD students pair up to design environments for Children's Hospital of Philadelphia patients who can't leave the hospital on Halloween to trick-or-treat. Canty believes local architects and designers "have an obligation to reach out to an institution like CHAD, and to build the architecture community over the long term."

> "The jobs of the future require the skills difference we can make, not just as designers, but perhaps more important, as leaders."

Tim Hayduk, director of Learning by Design:NY, a program run by the Center for Architecture Foundation in New York, which facilitates design instruction in the city's public schools, sees exposure to actual practitioners and real-world design challenges as part of the key to growing young people's interest in architecture. Over 52,000 students have been served by the program, many of them studying local challenges such as implementing a green roof on a school building and learning about engineering, planning, and modeling in the process. Working architects sit on the program's board and often attend student design crits; at a recent visit, a board member spotted an exceptionally talented student and offered him a summer internship on the spot. Hayduk notes that it's these kinds of encounters that help "break the walls down and allow new opportunities to happen."

Implicit in the push for more design education is the chance, or the hope, that it will produce a new generation of architects more diverse than the current one. Despite CHAD's underlying focus on architecture, only 15 percent of CHAD's alumni go into the profession. According to Miguel Vazquez Gomez, the school's director of college placement, "There's room for improvement there." (And there is definitely room for improvement nationwide.) Still, Gomez notes, the school's mission is to use architecture and design as a mode of instruction—not just to groom architects—and the majority of CHAD's students do attend colleges that focus on architecture, design, or the arts, with 60 percent of graduates over the past five years entering the design field.

For many urban public school students, Kountz notes, the priority may be less on becoming an architect or designer than on sticking through college—a task that can seem daunting when 90 percent of CHAD's entering ninth graders read, write, and quantify at a fifth- or sixth-grade level. For Kountz, CHAD is so much more than just a professional incubator: "It's not just about architecture—it's about the students' lives," he says.

And CHAD has clearly made an impact on its graduates. Canty has hinted he might return to Philadelphia to teach at the school and continue the educational legacy that set him on his own path to higher education. AIA

AIAPERSPECTIVE

THE FUTURE FOR EDUCATION

PHOTO: WILLIAM STEWART

THE FALL 2010 ISSUE OF *CRIT, JOURNAL OF THE AMERICAN INSTITUTE of Architecture Students* (AIAS), focuses on the future role of architects: Will the profession be fundamentally a passive utility, responding to the perceived or imagined needs of the client; or will architects engage their clients, including the public, actively informing and shaping their needs in such matters as, say, health and sustainability?

As fifth-year Syracuse University student and *Crit* contributor Stephen Klimek correctly recognizes, the way the next generation of the profession answers that question is being determined right now in the schools. There, the art and science of an ancient profession are being transmitted and shaped by current research. But just as potently, values and habits of thinking are likewise being rehearsed and ingrained by the day-to-day activities inside the classroom and studio. Are students learning entrepreneurial habits of thinking and how to use time? Are they interacting with students outside their discipline?

For that matter, what are the opportunities to get off campus and into neighboring communities? Is engaging the public and informing their concerns specifically identified as an integral part of one's education or strictly elective and extracurricular?

As I'm sure Klimek would admit, these are not new issues for our profession. What makes them urgent at the beginning of the second decade of the 21st century are the times in which we find ourselves. Never before have the inhabitants of this planet had greater reason to alter course from the present destructive slide into a dangerous future. At the same time, never have the rising generations of architects had a greater potential to exert their full potential in helping to heal a grievously injured world.

The issues all of us face are fundamentally matters of design. We all know the litany: transportation, security, health, productivity, land use, energy, climate change, and, yes, sustainability. However, there is a crucial disconnect between fact and remedial action that makes a difference: Most elected officials and many clients do not see the connection and the relevance of design in addressing these issues. That's the problem we must address, and addressing it meaningfully begins in the schools with faculty, students, and professional mentors alike consistently and forcefully identifying civic engagement as a core value of our profession.

In an increasingly congested world, the schools should be preparing those who will graduate to apply their knowledge to help cities and smaller communities become safer and healthier. Never have design professionals been in a better position to mediate, or become part of, the life-shaping human-environment connection.

The profession and those who practice must be committed to a civic dimension. Architects should be facilitators and listeners, prepared to talk with clients and communities about how design can contribute to creating more wholesome and sustainable conditions for present and future generations. Klimek calls on students to become "players and stakeholders in the development of our future." The AIA's Citizen Architects program connects and supports those who are doing this in communities across the country.

I recall as a student taking a perverse pride in the all-nighters, the projects that kept us locked in studio, living on barely warm takeout pizza, sleeping on top of—and sometimes under—our desks. Yes, it did build a grim fraternity proud of our ability to endure sensory deprivation and the absence of others not in our field or even our class. It's time to get out from under our desks and out into the larger world we should serve.

In a thoughtful article that appeared late last year in the Toronto *Globe and Mail*, Lisa Rochon wrote: "Architecture is only as great as the aspirations of its society." Engaging with (not lecturing!) society from the time we are students may not stop bullets, but we can shape an environment for hope. AIA

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BUSINESS

INTERVIEW BY ERNEST BECK
PHOTO BY SIOUX NESI

→BEST PRACTICES

Think Big

Small firms get pigeonholed as small-scale designers. Partner up, says **Joel Sanders**, founder of Joel Sanders Architect, to get projects that are larger and more diverse in scope.

WITH A 13-PERSON STAFF and projects that run the gamut from high-end residential to retail, academic institutions, and public parks, New York–based Joel Sanders Architect is a small practice with a big portfolio. Founder Joel Sanders, AIA, who established the studio in 1986, says the firm's goal is to create provocative, innovative design at a range of scales and building types. That can be a daunting challenge for any small firm, especially at a time when global megafirms can deploy huge resources to secure assignments. To compete, Sanders teams with outside collaborators and experts and closely manages daily operations. He spoke to ARCHITECT about what works best when his small firm wants to scale up.

Diversify to thrive.
There are many models for small offices, and some do specialize. But having a diverse range means more opportunities than having a focus on small-scale, single-building-type projects, Sanders says. Unfortunately, some people equate small office with small scale and perceived limitations.

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"My objective is a broad range of projects and building scales to avoid being pigeonholed in any particular area."

Reach out to collaborators.
Of course, no firm can do it all. Sometimes you have to play with the big boys. "So forge collaborations with other firms that have project-specific complementary skills," he suggests. "For example, we're working with large firms like Haeahn Architecture and RMJM on a complex of high-rise residential towers in Seoul, South Korea. And we partner with Beyer Blinder Belle Architects & Planners, tapping into their preservation expertise, on GSA projects." For small firms, partnerships help expand horizons.

Cross professional borders.
Don't be afraid to reach across the aisle to other design professionals, such as landscape architects, Sanders recommends. You can question existing professional divisions between disciplines "and create interdisciplinary collaborations." Put it this way to a client: Don't just hire an architect and then ask someone to put in trees.

Partner from start to finish.
You can do more as a team from the very beginning, Sanders says, as with his collaboration with landscape architects Balmori Associates to transform the median strip parks composing the Broadway Malls in New York City. "We were together from inception and bidding to completion."

Know yourself, and adventurous clients will follow.
Establish a distinct philosophy that defines your firm, Sanders offers. For example, he is concerned with the architectural consequences of how contemporary issues such as digital technology and new family structures transform lifestyles. That worldview has attracted open-minded clients from New York University to a developer building an LGBT retirement community that explores issues of aging and family identity.

Hire multitasking staff.
In a small firm, you need people who fit the jack-of-all-trades definition, Sanders says. "They must be flexible and nimble types who can roll with the punches and shift between projects and do a lot of everything," he explains. It's critical to work in teams on everything from preparing construction documents to presentations—and to be sure, it's not for everyone. "We look for people who want to experience the full spectrum of being an architect."

Those who can, teach.
Getting out of the office and into the classroom keeps you in the loop on current discourse and informs work generated at the office, Sanders believes. You meet and interact with colleagues and potential collaborators. What's more, "it provides a talented pool of potential staff," says Sanders, who is an adjunct professor at the Yale School of Architecture.

Run a lean machine.
"In an ideal world, you'd want the resources of a large firm to run the office," he says. "We'd like to have that but we make do with an office manager, a bookkeeper, and three associates." The hard-working office manager handles marketing and press and keeps the trains running on time—reminding everyone to meet deadlines.

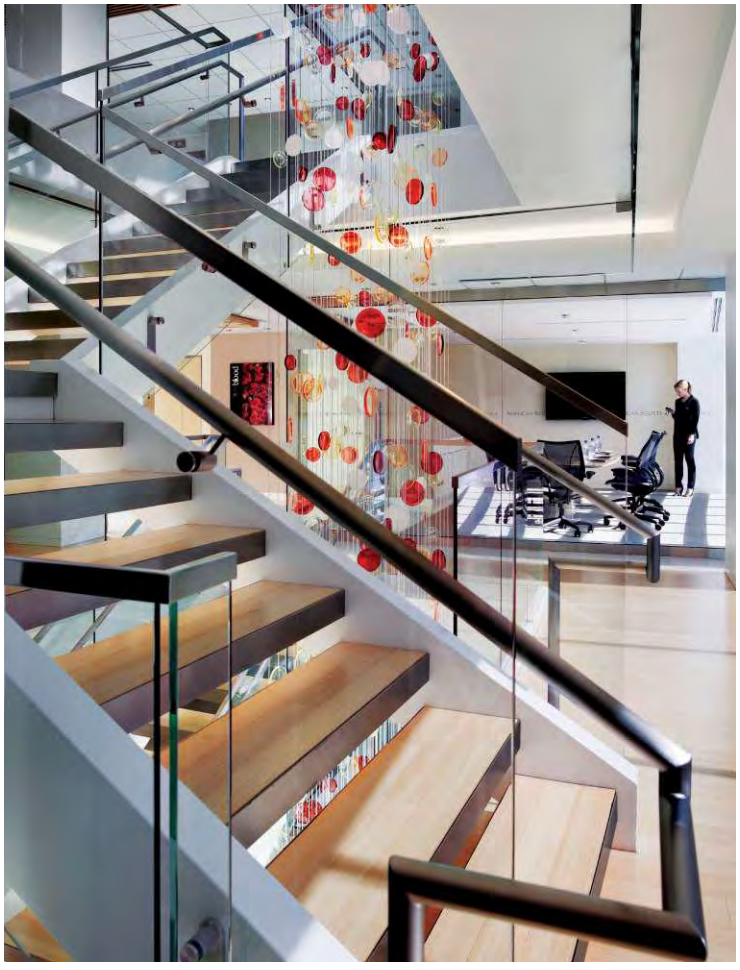
Stay involved.
One of the biggest challenges of running a small office is balancing day-to-day administrative demands with design, without losing touch with the work and the clients. That's why he gets involved in every aspect of the job. "It can be overwhelming sometimes," Sanders says. "But I'd rather be involved than lose touch. For me, that's what the passion of architecture is all about." □

→TYPOLOGY

Class A Office

RISING PROFITS, IMPROVING GREEN STANDARDS, AND SLUGGISH HIRING YIELD A MIXED PICTURE FOR CLASS A SPACE.

TEXT BY JENNIFER CATERINO



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Last fall, the American Society of Hematology moved into its new headquarters. The nonprofit occupies 40,000 square feet in the LEED Platinum building; the remaining 80,000 square feet will be marketed to similar organizations as leasable space.

THERE'S SOMETHING ABOUT SURVIVING a financial crisis that changes people's expectations. How else could a market that continues to report a national vacancy rate north of 16 percent, according to Colliers International, be considered anything close to "optimistic"? Still, preface that with "cautiously," and you'd be describing how most experts assess the country's current Class A office market.

After rising for 12 quarters, U.S. office vacancies declined in the last quarter of 2010, according to Colliers' fourth-quarter 2010 office report. At the same time, the market absorbed just under 15 million square feet of space, more than double the amount absorbed in the prior quarter. This alone indicates that the office market has "turned the corner," the Colliers report says, but CB Richard Ellis (CBRE) points out that new construction prospects for North America are dismal, with 7.8 million square feet expected to come online in 2011, followed by just 2.6 million square feet in 2012.

Hiring Power

It is easy to be encouraged by corporate profits, which rose to an estimated $1.64 trillion in the third quarter of last year, according to data from the Bureau of Economic Analysis. But the need for space isn't driven by profits—it's driven by employment, says Todd P. Anderson, a senior managing director in the El Segundo, Calif., office of CBRE. It's not until a company hires more people that it increases its space requirements.

→

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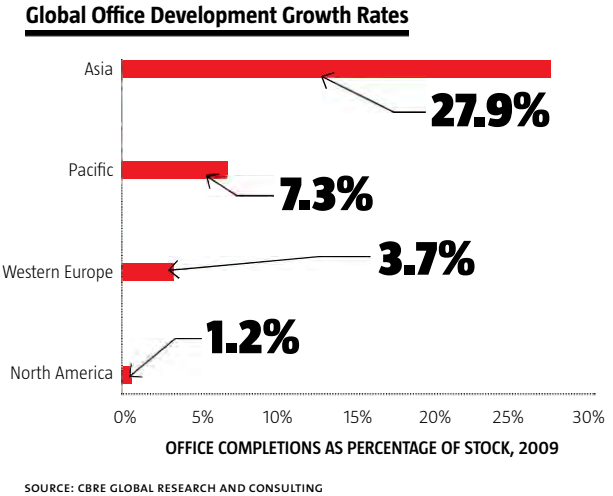
This 15-story, 535,500-square-foot building consists of two rectangular office slabs connected by a 230-foot-high glass-enclosed atrium with a central elevator bank. One tower is occupied by the Diamond Exchange; the other is speculative office space.



SOURCE: CBRE GLOBAL RESEARCH AND CONSULTING

The nation's unemployment rate is on a downward trend, according to the Bureau of Labor Statistics, but nonfarm payroll employment has yet to show significant gains. Still, Jones Lang LaSalle (JLL) identifies three "rising markets"—Pittsburgh, San Francisco, and Washington, D.C.—in its U.S. fourth-quarter 2010 Office Outlook. The balance of the country is moving through the "bottoming market" phase.

"Fourth-quarter data confirms our view that the U.S. office market has entered the recovery stage and will likely make continued progress, assuming the economy stays on the current path. Most encouraging is the 12-month-long gain in private sector employment," says Colliers chief economist Ross Moore in that company's report.

Richard Kadzis, vice president of strategic communications for CoreNet Global in Atlanta, agrees that there is an undercurrent of optimism. "Boards are starting to pressure companies out of asset-protection mode," he says. "Companies are going to start reinvesting in their businesses again."

Stay or Go?

Many American companies are still cutting margins and not inclined to deal with the capital outlay associated with relocating. Because of that, says James E. Prendergast, AIA, a partner of Goettsch Partners (GP) in Chicago, many more tenants are choosing to stay put. "The conventional leasing model assumed 25 to 30 percent of tenants would 're-up and stay' when their leases came due. From 2008 through today, it [the renewal rate] is 65 to 70 percent," he says.

In New York, where Colliers reports that the vacancy rate fell to 12.8 percent at the end of last year, landlords continue to make tenant concessions, says HOK principal Anthony Spagnolo. "Offers such as completely demolishing a space at no additional cost to the tenant and providing generous space upgrade packages have been more of the norm lately," he says. Spagnolo also is seeing "strategic upgrades" to common areas, all designed to help landlords market properties as Class A.

JLL's report notes that several of the largest leases signed in New York in 2010 involved less square footage than the tenants' prior locations. In general, JLL says, tenants continue to remain stable from a size standpoint and are even rightsizing.

Joseph Brancato, AIA, managing principal of Gensler's Northeast region, confirms that the firm's corporate clients are focusing on strategic real estate decisions. "For many, their current portfolios are like Swiss cheese—in that there are pockets of vacancy throughout. They want to consolidate," he says.

Green Gains Ground

Hraztan Zeitlian, AIA, principal and design leader in DLR Group WWCOT's Santa Monica, Calif., office, argues that the most surprising development in Class A office development is the tenants' awareness of and demand for green building measures. "In fact, a high level of incorporation of sustainability measures is now a prerequisite for Class A office buildings," he says.

An ongoing study of a national office portfolio managed by CBRE reveals that sustainable buildings are expected to generate stronger investment returns than traditionally managed properties. The study found that owners of sustainably managed buildings anticipate a 4 percent higher return on investment than owners of traditionally managed buildings, as well as an increase in building value. Roughly 79 percent of owners surveyed believe that sustainable properties yield an increase in building occupancy and rental income.

A Better Balance Sheet

If growth plans or a desire for more efficient, greener spaces don't spur moves, a proposed lease-accounting change from the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) might make firms reconsider their office needs.

In what Real Capital Analytics (RCA) cites as the largest single-asset transaction of 2010, Google paid $1.8 billion for 111 Eighth Avenue in New York. Not only did this result in a fast-schedule job for HLW International, which followed LEED-CI guidelines to transform the 100,000-square-foot floorplate into individual and team

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U.S. Office Market: Asking Rents Per Square Foot, Q4 2010

(Change from Q3 2010)

DOWNTOWN CLASS A

$39.29

(0.9%)

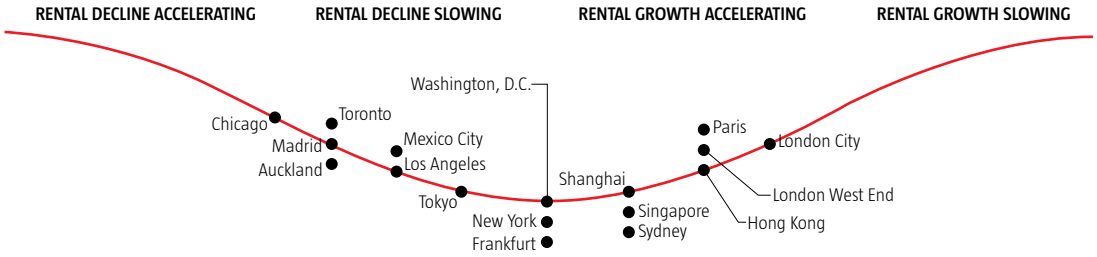
SUBURBAN CLASS A

$26.04

(-0.9%)

SOURCE: COLLIERS INTERNATIONAL

Rental "Traction" Snapshot: 3Q



SOURCE: CBRE GLOBAL RESEARCH AND CONSULTING, NOVEMBER 2010

spaces fit for "Googlers," it may portend more corporate buyers, according to RCA's U.S. Capital Trends January 2011 Year in Review.

As CBRE's Anderson explains, the proposed accounting change, known as FAS 13, will require companies to record real estate leases and leased equipment as amortization and interest expenses on the income statement, and add them to their balance sheets as assets and liabilities. The final standard isn't expected until later this year, but Anderson says his colleagues and clients expect it to be codified.

"On a practical basis, FAS 13 will have the biggest impact on publicly traded companies because private companies are less sensitive to the analysis of their financial statements," Anderson says. Kadzis estimates that $1.3 trillion, at a minimum, will be moved to corporate balance sheets as a result of FAS 13, and more expensive, short-term leases are expected to rise in popularity as a means to minimize the rule's effects. As for who will opt to build or buy, Anderson says a company that leases most of its space will have to decide if it makes more sense to lease or buy, especially if it needs to control space for 10 years.

"This will result in a higher ratio of owned assets," Kadzis says. "People previously leased [more than owned] for flexibility and lease purposes. With the FASB change, everyone has to think differently."

Foreign Affairs

With so little new office development in the U.S., architects have increasingly been drawn to Asia. Matthew C. Larson, Assoc. AIA, GP's director of business development, estimates that Asia work used to account for one-third of the firm's practice. Today, it's closer to 40 or 45 percent, he says, adding that GP has about 15 projects currently in some phase of development in China. RTKL vice president Scott Kilbourn, AIA, reveals a similar pattern at his firm. "Three years ago, one half of our commercial work was in the U.S., and Asia accounted for one-fourth or one-fifth of the pie." Now, half of that work is overseas, much in Asia, he says.

Driving this shift is the fact that 65 percent of new office development slated for completion between 2010 and 2012—190.6 million square feet—is planned for the major commercial centers of Asia, according to CBRE Global Research and Consulting.

Like many American firms working in the region, RTKL and GP can trace their work in China back about 20 years, and both maintain China offices. While larger firms may be better equipped to serve foreign markets, design the complex mixed-use projects typical of the region, and navigate its financial system, Kilbourn contends that smaller firms can create opportunities through associations with Chinese firms or joint ventures.

"In China, there remains a very high demand for international architects," Kilbourn says. □

ONE ANALYST ESTIMATES THAT $1.3 TRILLION IN LEASES WILL BE MOVED TO CORPORATE BALANCE SHEETS AS A RESULT OF FAS 13, A PROPOSED ACCOUNTING CHANGE.

→EDUCATION

Green Cred

AS DEGREES AND CERTIFICATES IN SUSTAINABLE DESIGN BECOME INCREASINGLY POPULAR, WHAT BENEFIT, EXACTLY, ARE STUDENTS GAINING?

TEXT BY KRISTON CAPPS
ILLUSTRATION BY MCKIBILLO

IT WAS ONLY A MATTER OF TIME before LEED credentialing launched a cottage industry in green education. The professional-training-course and educational-guide company Kaplan, which preps students for critical exams such as the SAT and LSAT, now offers study guides and sample tests for the LEED v3 exam. And in the world of higher education, a number of schools have created graduate programs emphasizing technical training in sustainable design.

The University of Florida, the University of California system, and the New Jersey Institute of Technology are just a few of the institutions that have recently begun granting sustainable-design certificates—by day and by night, in the classroom and on the Web, and, in some cases, to architects and English majors alike. Master of Science programs in sustainable design are offered by schools including Philadelphia University and the Catholic University of America.

Does an emphasis on flexibility—including programs tailored to student preferences and available to so many—undermine academic standards?

Ted Landsmark, Assoc. AIA, is president of Boston Architectural College (BAC), which offers a Master of Design Studies as well as a certificate in sustainable design. Landsmark says that flexibility is a fundamental characteristic of sustainability itself. Fittingly, neither of the school's programs is conducted at its Newbury Street campus, nor is its faculty centered around Boston. For its certificate program, the BAC offers a selection of 31 courses, all available online. "What has emerged is a sustainability learning community that is in a position to address sustainability challenges in different parts of the world," Landsmark says.

Yet for programs emphasizing sustainability, this recent development in education is in some ways unsustainable. Though the BAC's courses are accredited, the sustainability programs are not accredited per se, as there's no accrediting agency for sustainability. The schools lend these post-professional programs credibility, Landsmark says, despite the skepticism that surrounds online education.

"We have found that people in remote areas are interested in taking part because they trust that courses from an accredited college will have a rigor that might not emerge from private sources," he says. "Courses we teach online are directly comparable to regular courses offered" at the BAC.

With course offerings increasing from 12 to 31 between January 2009 and May 2010, the BAC's sustainable-design program is modular—so much so that a prospective student does not even necessarily need an undergraduate degree to acquire a certificate in sustainable design, according to the executive director of educational initiatives, Curt Lamb, AIA. The

→

24%

Percentage of college applicants who said that a college's commitment to green practices would "very much" impact their decision to apply.

2009 PRINCETON REVIEW COLLEGE HOPES AND WORRIES SURVEY

→ "I WOULD PREFER TO SEE ... THAT AN MSSD [MASTER OF SCIENCE IN SUSTAINABLE DESIGN] BECOMES REDUNDANT. YOU COULD ARGUE THAT IF THE FACULTY WANTED TO CHANGE THE CURRICULA, THEY WOULDN'T NEED TO IMPLEMENT A SUSTAINABLE-DESIGN PROGRAM."

—CHRIS GRECH, CATHOLIC UNIVERSITY OF AMERICA

modularity of this program is an effort to appeal to a wide array of students from the "allied fields" of real estate, facilities management, journalism, and, of course, design.

Chris Grech, associate professor at the Catholic University of America and director of its Master of Science in Sustainable Design (MSSD) program, describes the spread of sustainable-design programs as a sort of temporary corrective. "I would prefer to see an architecture degree including a greater component of sustainable design so that an MSSD becomes redundant," Grech says. "You could argue that if the faculty wanted to change the curricula, they wouldn't need to implement a sustainable-design program."

Nevertheless, Catholic University offers an MSSD as well as a two-track certificate in sustainable design. The master's degree, which is now three years old, calls for 30 hours of coursework, while the certificate takes just 12 hours. The technical track comprises two energy-modeling courses (Systems and Simulation I & II), a materials course, and an elective. The nontechnical track—which requires no prerequisite coursework—substitutes sustainable design and ethics courses for the energy-modeling classes.

"The certificate is a sort of hook or a tempter, really," Grech says. "We found some prospective students who didn't want to oblige themselves to apply for the whole program, so in a sense the cert is a taster."

Do these programs offer an escape for designers—and others—facing a lack of work in a blighted economy? Grech says that the industry had already changed in fundamental ways before the recession. "That was the initial reason for setting up the program: to appeal to practitioners, irrespective of the recession. To increase their skills and inform them about new industry standards."

The larger economic picture has certainly influenced enrollment at his school, says Rob Fleming, AIA, director of the new MSSD program at Philadelphia University. Older students pursuing new skills to build a case for keeping their jobs, along with younger students unhappy with the sustainability practices at their current firms, make up most of the school's first class for its certificate in sustainable-practices program.

The biggest factor in the growth of these programs, Fleming says, is an education gap. "The fact that these [programs] exist means they're filling some sort of vacuum in traditional programs," he says.

Although a 12-hour certificate program does not a sustainable designer make, those who begin on a nontechnical track in sustainable design can become invested in the field long-term. "Two students who started on the certificate have gone on to the full [Master of Science] program," Grech says. □

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→LOCAL MARKET

Guam

TEXT BY MARGOT CARMICHAEL LESTER AND CLAIRE PARKER

MARKET STRENGTHS
- Access to Asian and U.S. supply chains and markets
- Local economy bolstered by military and tourism
- Abundant natural resources

"Guam is heavily influenced by the economies of Asia rather than just the United States," notes Jack B. Jones, FAIA, principal of local firms PTJ Architects and J.B. Jones Architects. "In addition, the strategic aspects of Guam's location have buffered other possible economic impacts as military spending continues to roll in along with the much-anticipated eventual transfer of the Marines from Okinawa" in Japan.

MARKET CONCERNS
- Limited labor pool
- Local government financial issues
- High cost of living

"Poor government results in run-down infrastructure systems and struggling public school and hospital systems," notes M. Asmuni Abdullah, AIA, principal of MV Architects, a local firm. The cost of living is high, he says, "due to importation of 99 percent of commodities and what we eat, wear, and enjoy having."

POPULATION & JOB GROWTH
Current population: 180,865, with an 18% increase to 213,420 expected by 2020. Total employment: averaging 1.5 percent growth since 2005.

Karl A. Pangelinan, administrator of the Guam Economic Development Authority, attributes the rapid growth to "both the Marine relocation and the surge of labor necessary to put the required infrastructure and operational facilities in place."

RESIDENTIAL MARKET
The median home sale price for a three-bedroom home in December 2010 was between $212,000 and $250,000.

COMMERCIAL REAL ESTATE MARKET
Office space in the 3.3-million-s.f. Class A commercial market starts at $2.10/s.f., rising to $5.00/s.f. in premium buildings.

"Housing and commercial centers are currently a big market outside of military bases, and warehouse building and temporary worker housing projects are on the increase as well to meet current demand," Abdullah says.

FORECAST
"With a population under 200,000, Guam has a great deal of open space and room for expansion," Jones says. "How Guam manages the planning and control of the associated development will have huge implications on the long-term character ... of the island. Fortunately there is a very high understanding of this need throughout the community, etched into the island's psyche by past successes and failures."

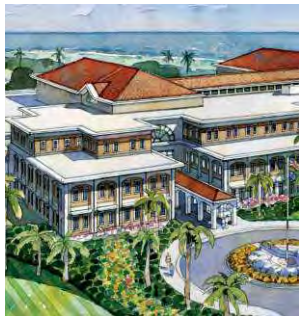
22%
Increase in Guam total real estate sales volume, 2009–2010

SOURCE: CAPTAIN REAL ESTATE GROUP

Coast360 Federal Credit Union
ARCHITECT: EHS Design, Seattle, Wash.
COMPLETION: October 2010.
BRIEF: $15.6 million, 48,000-s.f. flagship branch, targeting LEED, features the only locally produced building material, coral limestone aggregate.

Guam Community College Learning Resource Center
ARCHITECT: Taniguchi Ruth Makio Architects, Guam.
COMPLETION: 2010.
BRIEF: $5.9 million, 20,000-s.f. research center with computer labs was funded by a combination of stimulus and other federal and local funds. LEED certification is expected.

Inarajan Historic Architectural District Revitalization Plan
ARCHITECT: American Institute of Architects, Guam and Micronesia Chapter.
COMPLETION: 2011.
BRIEF: The historic district is the last remaining example of the scale and character of Guam villages from the early 20th century.



U.S. Naval Hospital Guam
ARCHITECT: Sherlock, Smith & Adams, Montgomery, Ala.
COMPLETION: 2014.
BRIEF: $158 million, 42-bed facility will replace the existing hospital built in 1954. Features include a rainwater capture system, native vegetation and high-albedo roof materials.

CLOCKWISE FROM TOP LEFT: EHS DESIGN; TANIGUCHI RUTH MAKIO ARCHITECTS; U.S. NAVY; TANIGUCHI RUTH MAKIO ARCHITECTS

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EDITED BY LAURIE GRANT
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Marin County Day School
Architect - Mark Cavagnero Associates
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TEXT BY BRIAN LIBBY

Steelcase's LearnLab classroom (the example shown here is at Michigan's Grand Valley State University) was designed to support multiple teaching and learning styles. It seemed like the right model to administrators of the University of Oklahoma's College of Architecture, who want to encourage creativity and collaboration.

IN 2008, WHEN CHARLES W. GRAHAM was recruited from Texas A&M University to serve as dean of the College of Architecture at the University of Oklahoma (OU), the intent was to elevate the program's prestige by embracing innovative practice. That meant greater collaboration among students and between students and faculty, aided by high-tech learning spaces.

"It didn't take too long to realize we didn't want to go back to a 20th-century method of teaching," Graham says. "We've just tried to acknowledge that kids are tech-savvy and we don't want to discourage that. We think a contemporary learning environment is about creative making. You develop ideas in your mind and by drawing, and using technology, that brings it alive."

When Graham came to OU, the College of Architecture's home, Gould Hall, was already undergoing renovation, and the college had temporarily moved to a swing space two miles away. He and the faculty decided to break in a new paradigm of high-tech studio spaces early, while still in the swing space. The school worked with Steelcase, a leading furniture manufacturer, to develop two collaborative classrooms that embrace interactive technology. Steelcase recommended that the school adopt its LearnLab environment, which is designed to support multiple learning styles and break down the hierarchy between professor and student. The intent is for students to transition easily between lectures, group work, and individual presentations.

OU is the first school of architecture to install a Steelcase LearnLab (other higher-education institutions, such as Hobart and William Smith Colleges and Grand Valley State University, had adopted the model for teaching in other disciplines), so administrators wanted to make sure it was adaptable. "We took what they had … and really thought, 'How can we take their concept but retrofit it for design students?' They're a lot more hands-on and need more time in the classroom," says assistant professor Christina Hoehn, who took a lead role in the project. "Their studios are usually four or five hours each."

Installed in December 2009, the OU School of Architecture Learn Lab—one of two new instructional spaces with the new layout and technology—has no front or back; tables and chairs are arranged for students

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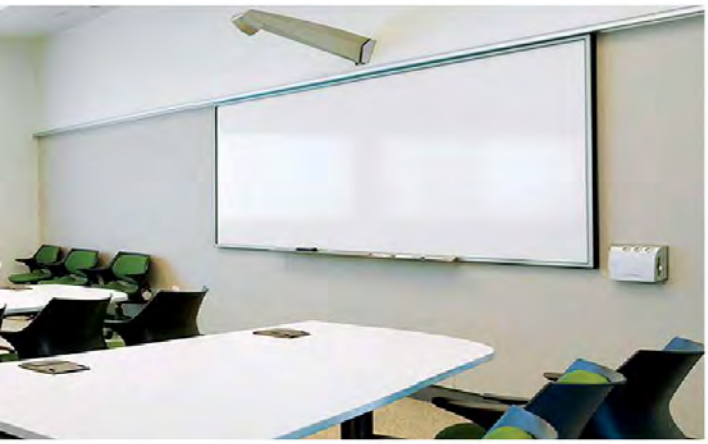

to gather around in a group. Two projector screens are set up within the space (roughly 1,100 square feet), so students have strong sight lines from any seat. There is also an ēno interactive whiteboard, which can be marked up and erased indefinitely with a regular dry-erase marker or a Bluetooth-enabled stylus. Multimedia presentations can be projected onto it, and notes can be saved and e-mailed.

"The ēno board[s] caught our attention," Hoehn says. "They have a ceramic carbonate casing over the top that allows them to be impervious. Because these are design students, they'll have scissors, markers, X-acto knives. They glue things and burn things and laser-cut things. We knew if we moved this technology into their rooms and spaces, it had to stand up to them."

The ceiling is outfitted with a camera to view student projects or documents placed under it (models, handouts, books, photos). The projector screens can show the same, or different, content. Any of 17 laptops can be switched to display on the communal screens. There are also 10 portable whiteboards, which can be moved from a table surface to wall-hanging positions, and can be copied to the class website via a CopyCam, which attaches to a regular whiteboard and saves notes and sketches for later use. More than any one piece of furniture or technological item, the idea is that all of it can be easily reconfigured, although, Graham says, sometimes cables and cords slow that process.

The other new OU facility is a smaller glass-walled enclosure in the middle of a standard design studio. This "SuperStudio" is meant for critiques, with two large plasma-screen TVs attached to an interactive media table, which can share information from up to six student laptops at a time.

Elise Valoe, senior researcher for Steelcase Education Solutions Group, believes that the LearnLab concept enables

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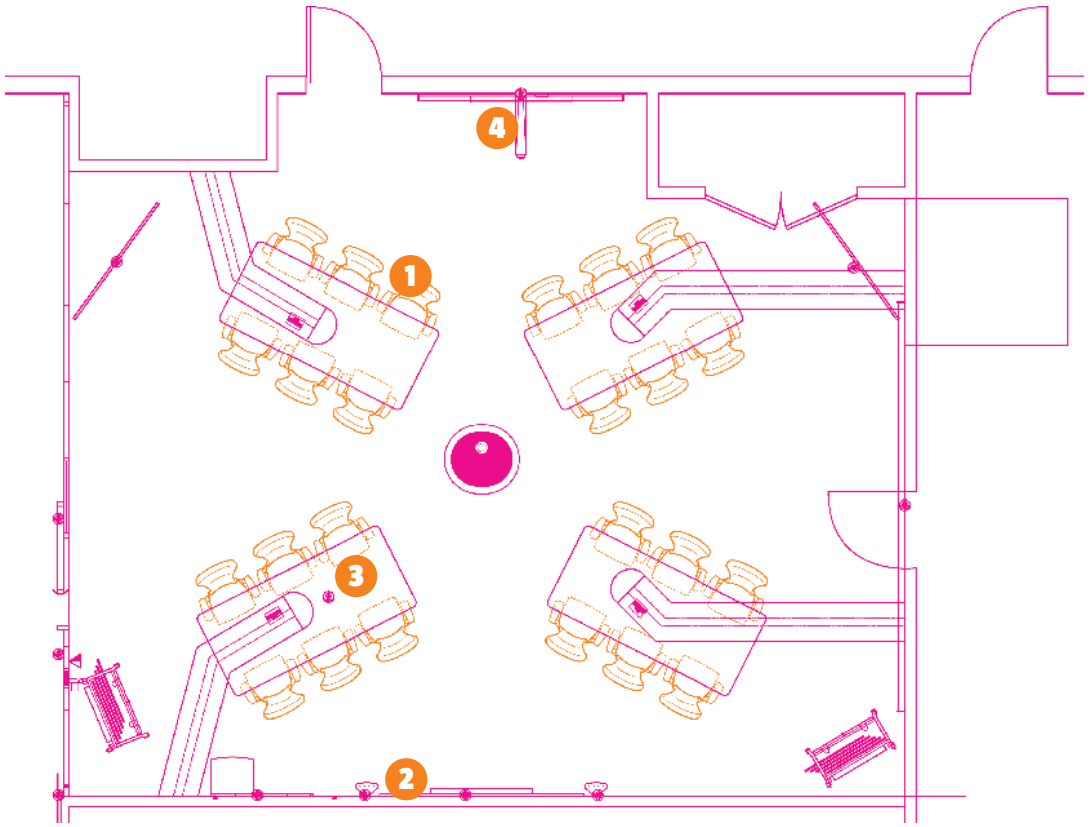
67%

COLLEGE STUDENTS WHO SAID IN A RECENT SURVEY THAT THEY PREFERRED TAKING COURSES THAT USE A GREAT DEAL OF TECHNOLOGY.

SOURCE: CENGAGE LEARNING

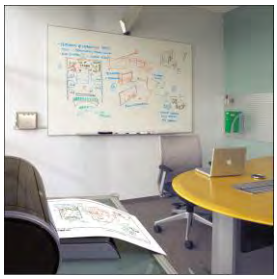


JAMESON SIMPSON

1. cobi chair

2. ēno board (PolyVision brand)

3. Derby table (Coalesse brand)



4. CopyCam

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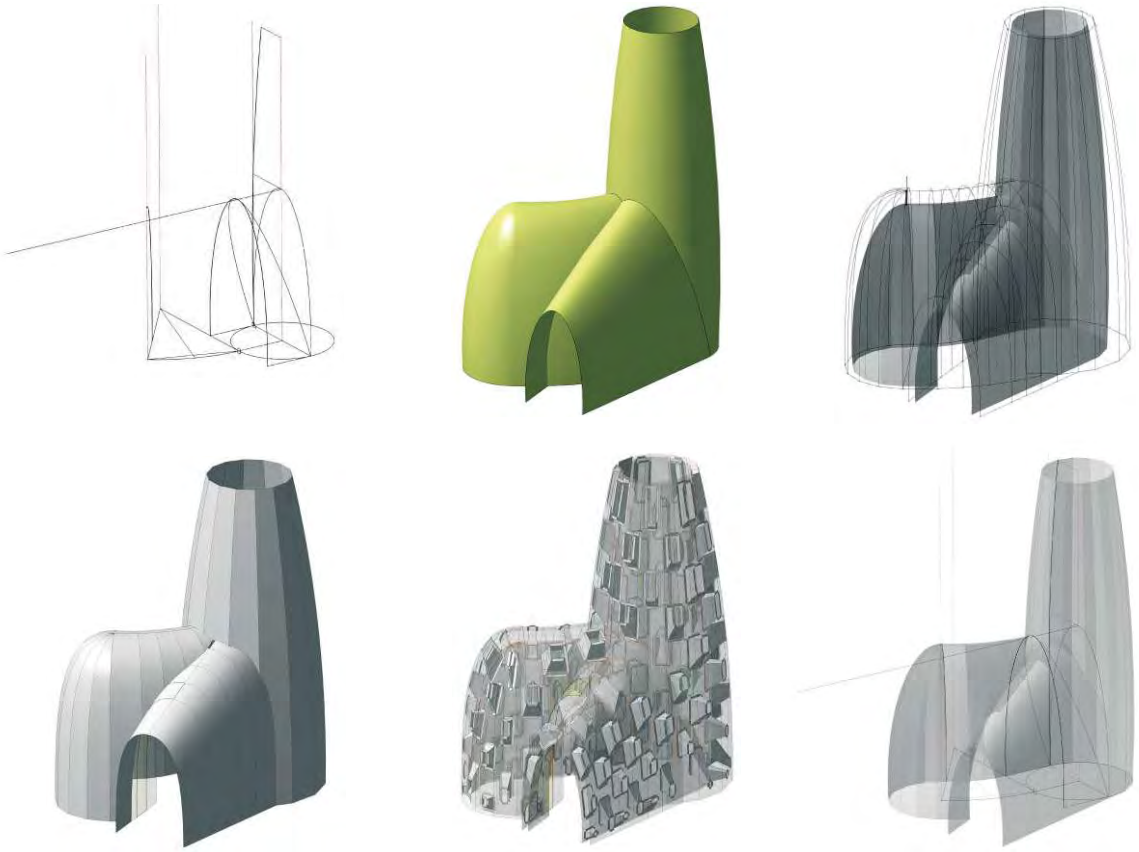
quick assessment of student work. "Instructors can easily have students work out ideas or problems in teams, then display their content for a quick mentor review," she says.

Some of the Oklahoma faculty has been forced to play a bit of technological catch-up. "I think the biggest issue we've had is people training on it," Hoehn says. "To push people to get the necessary training this year has been difficult. These are seasoned architects, and they don't want to be embarrassed by the students."

Hoehn recalls differing student and instructor reactions to an iPod dock, for example. "Students can walk in with their smart phones and set them in a dock in the room and play their music or show their videos and pictures. It's funny how they figured out instantly how to turn that on, whereas some of the professors were like, 'What is that?' It's just a paradigm shift."

Hoehn says that having the prototype labs has given the school time to study professor and student behaviors "and make sure we were going down a productive path." When Gould Hall is ready for them to move back in after graduation in May, "We will be taking the new technology and furniture with us … [and] adding more for the other new spaces." □



COURTESY GAIL PETER BORDEN

→DIGITAL FABRICATION

The Architect in the Machine

DIGITAL FABRICATION IS BLURRING THE LINE BETWEEN DESIGN AND BUILDING. THREE RECENT PROJECTS REVEAL ITS WIDE POTENTIAL—AND A FEW GROWING PAINS.

TEXT BY AARON SEWARD

THE ROLE OF THE ARCHITECT has always been somewhat problematic in one respect: While the designer is considered the author of the building, there is often a gap between the design concept and what winds up rendered for posterity in bricks and mortar. The goals of the profession can be abstract, whereas the end and sole purpose of its efforts have always been grounded in the physical—what can be built, and for how much money. The result is that, in spite of high aspirations, the idea of the building sometimes surpasses the end product, much like Plato's ideal chair.

Although architects may go through endless drafts of shop drawings and spend hours on site, it's not unusual for a building to reach completion with some misgivings from the design team. You hear things like, "In early sketches we had one sinuous curve, but it turns out they could only fabricate the panels in flat sections, so we wound up with this segmented condition."

Control is what it comes down to. How can architects assert more control over the physical outcomes of their designs? One method that is now gaining momentum is digital design and fabrication. Today's 3D computer modeling programs, such as Rhino and CATIA, have evolved into an integrated system in which designers can embed more and more information into their geometric representations, then translate these directly to production processes. This happens thanks to CNC (computer numerical controlled) machines, which use the same digital information laid down by architects to fabricate physical objects.

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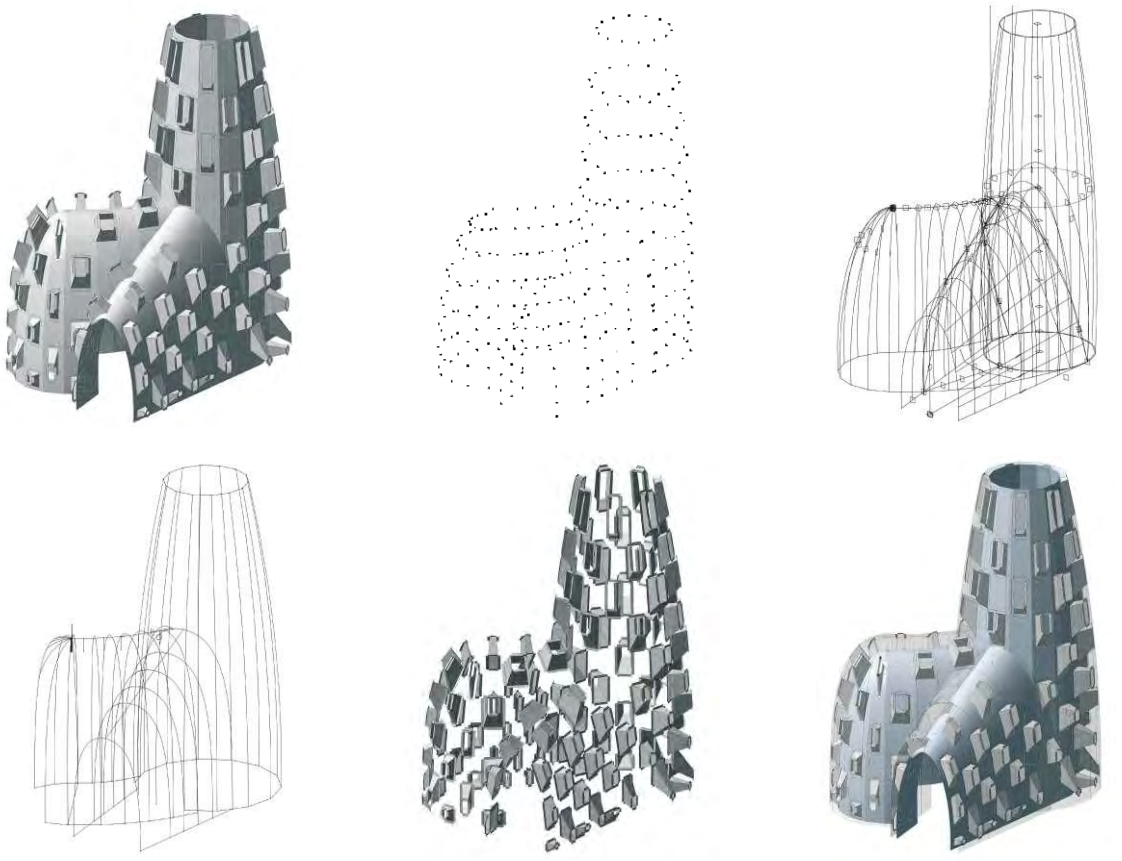
Learning Objectives

1. Describe why traditional drawing methods can leave room for error in the construction process.

2. Discuss how 3D modeling programs integrate the design and construction processes.

3. Describe how a 3D modeling program helped conceive at least one of the three projects described in this article.

4. Describe how an architect can use multiple 3D modeling programs to further enhance and streamline a design concept.



Gail Peter Borden's "Light Frames" project, erected on an infill site in Los Angeles (above), combines two structures, a tower made of EMT conduit (foreground) and a "light chapel" made of inflated PVC. The geometries were derived from a CATIA model. In the case of the chapel, however, digital modeling (left) did not translate to entirely digital fabrication: The PVC still had to be cut by hand.

The process moves the designer one step closer to production—it puts the architect in the machine.

Of course, even with more power to wield over the outcomes of their designs, architects still have to deal with project-specific conundrums and work with materials that have their own peculiarities. The three case studies that follow show how designers can adapt the digital design-and-fabrication process to a unique set of circumstances and a unique set of materials to create meaningful forms.

"Light Frames"
Gail Peter Borden

Materials & Applications is a nonprofit that produces two architectural installations each year on a smallish infill lot in the Silverlake neighborhood of Los Angeles. The exhibitions are free to the public; the goal is to create a test bed for new concepts in building. The most recent installation was called "Light Frames." It featured two separate structures, made from different materials, that sat adjacent to one another and nearly filled the little lot. The first structure is a skeletal metal dome made from bolted 1-inch-diameter galvanized-metal electrical conduit. It straddles the entrance to the lot and directs visitors toward the second structure, a chapel-like volume of inflated translucent and white vinyl, which is pierced through at intervals by apertures that let light inside while framing views to the exterior.

The project's designer is Gail Peter Borden, AIA, a professor at the University of Southern California who also runs his own firm, Borden Partnership. "This project was a response to L.A. materials," Borden says. "The conduit is a basic off-the-shelf material that references Gehry and chain-link fencing, while the vinyl carries the idea of plastics and the new materiality of Southern California. The two pieces sit in conversation with each other. … They both employ primal architectural forms."

The budget was also primal, so to speak: less than $3,000 for each structure. With that kind of funding, Borden couldn't afford to shop his designs around to digital fabricators, but the digital design process did, in the end, transfer directly to the construction process. Rather than turn to a high-tech machine shop, Borden relied on a hoard of student volunteers. He also had help from a heavy hitter in the industry: Buro Happold helped with the structural form-finding for the metal element and ensured its safety as a jungle gym, since Materials & Applications sits just a few doors down from Spaceland, one of L.A.'s premier rock-and-roll venues. ("People sometimes get drunk and then come down and interact with the installations," Borden says.)

The metal dome was modeled in Rhino, and the drawings bounced back and forth with Buro Happold as they worked out the stresses and effects of bolt connections on the lengths of the conduit. That same model was in the shop for reference while the students prefabricated the structure in five sections, and it was there on site when the sections were bolted together, acting as a reference and guiding the erection process.

The vinyl structure was modeled in CATIA, a parametric modeling program designed for the aircraft

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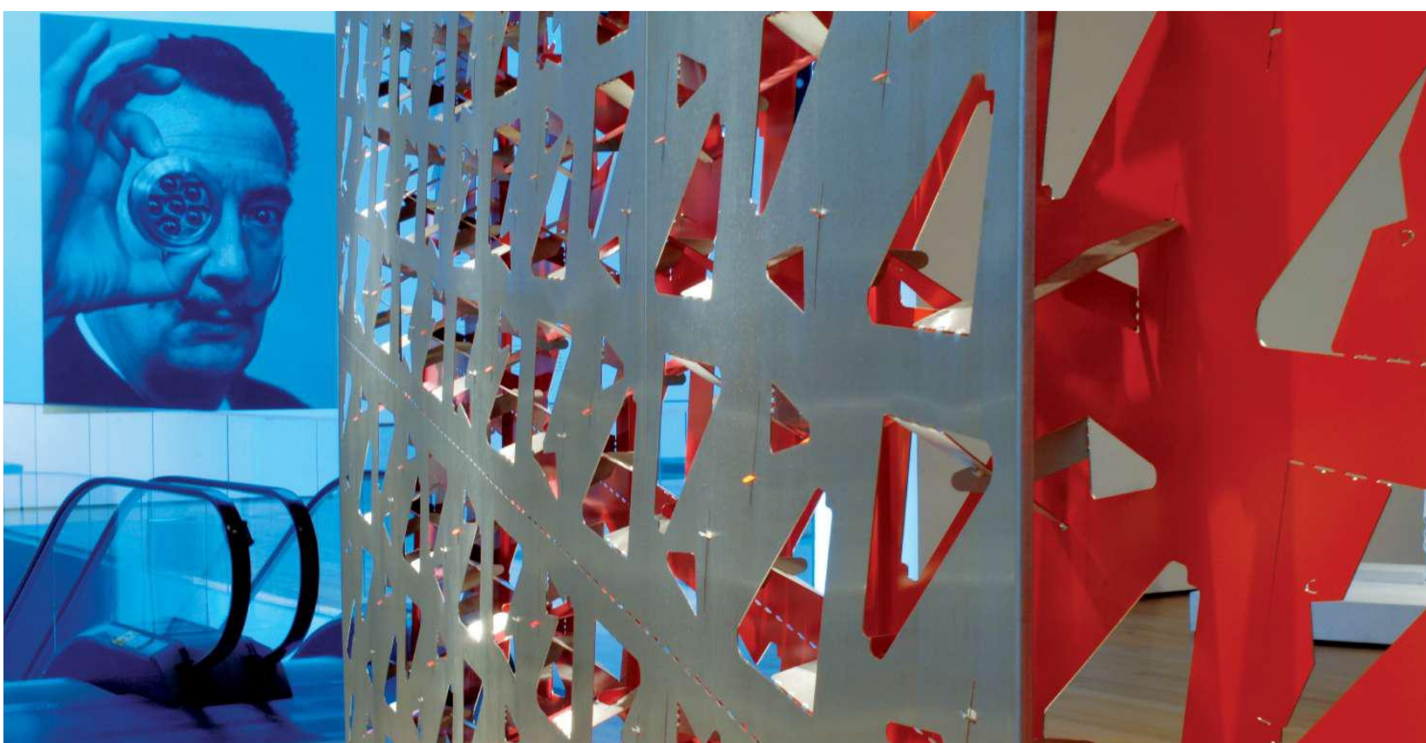

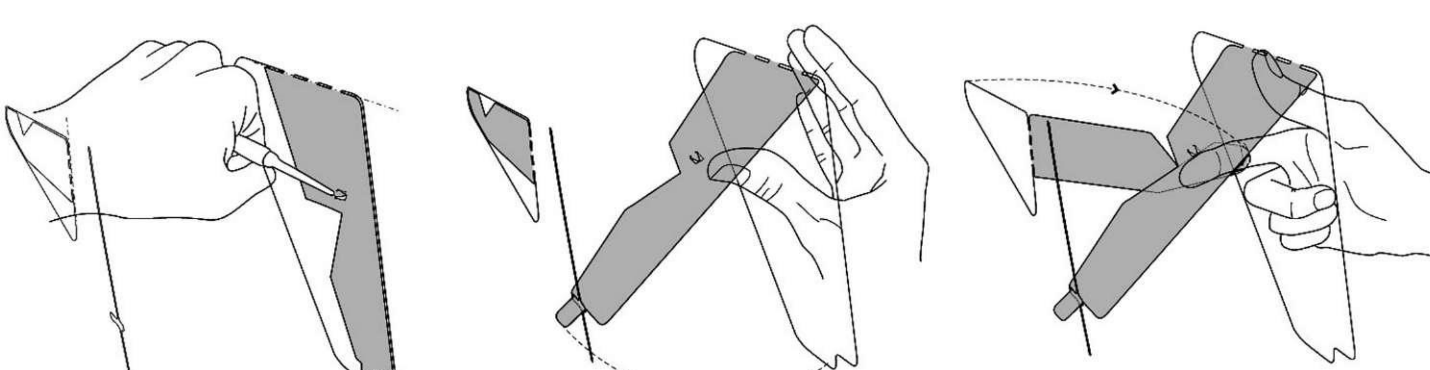

TOP: COPYRIGHT 2010 RACHEL RABHAN; MIDDLE AND BOTTOM: COURTESY MARBLE FAIRBANKS

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industry. Unlike Rhino, which is a simple 3D model that establishes points in space, CATIA allows the designer to imbed parts of a model with information that is governed by rules, or parameters. The parameters allow the program to calculate and make global changes throughout a model when the designer makes a local change. In this case, the 3D model was broken down into a series of shapes that could be cut from sheets of vinyl. CATIA turned each 3D piece into a flat piece. Once the entire structure was designed, all of those pieces were exported to RhinoNest, an optimization plug-in to Rhino that allowed the team to save on material. These optimized shapes were then printed as templates that the student laborers used to hand-cut the vinyl with knives. Borden considered using CNC laser-cutting for this part of the process, but it proved too expensive: Plus, the lasers would have singed the edges of the material, making for an unseemly edge condition.

The students assembled each of the vinyl pieces with heat and chemical welds, forming a unitary inflatable structure, much like a bouncy castle. Then the entire assembly was draped over a very minimal conduit structure—just strong enough to hold up the fabric. Once this was in place, two blowers were installed to inflate the pneumatic chapel. The blowers are set on motion sensors, meaning that the structure will inflate only when there's someone there to appreciate it.

Whistler Olympic Village Bus Shelters
Urban Movement Design and Associated Fabrication

Robyne Kassen, Assoc. AIA, and Sarah Gluck of New York City–based Urban Movement Design work in an area where movement, health, and architecture intersect. Trained as architects, the duo also specializes in yogic therapy and special-needs design. The first project that they worked on together, in 2005, was designing furnishings for the wheelchair-bound.

Their next project was a series of bus shelters, benches, and bike racks for the 2010 Whistler Olympic Village. Kassen and Gluck sought the project out themselves. Knowing that the Olympics would be held in Whistler and Vancouver, British Columbia, Canada, they guessed that the Paralympics would be held there as well. The duo flew to British Columbia and pitched the local director of planning, who it just so happened had studied kinesiology—the science of human movement. He was receptive to Kassen and Gluck's doctrine of design promoting health and sent them back to New York to flesh out their proposal.

While Urban Movement's Olympics amenities provide all the normal functions, they also take into account ergonomics, encourage deep relaxation, and provide an arena for users to stretch and strengthen. These factors are most evident in the bench component, which goes beyond the idea of a slab on which to rest one's behind. Rather, the surface morphs throughout its length to provide a variety of degrees of human repose, from a fully reclined Lay-Z-Boy–type position to an ideal upright position. "Points of contact are so important," Gluck says. "If you lie on a flat surface, your body will tend to conform to that surface, but we are not flat.

"The digital process allows us to make curved surfaces with great accuracy that will support the body in a healthful way, allowing the muscles to fall into alignment and ensuring that when we do move, we do so from a place of comfort, not stress."

Gluck and Kassen chose solid surface for their benches because it is soft and pleasant to touch, nonporous and hygienic, robust enough to withstand extreme weather, and easy to recondition after being besmirched with graffiti. The solid surface can also be thermoformed, making it perfect for creating the smooth and delicate curves necessary to provide the full support called for in the design. While solid surface makes up the bench surface, the frame is composed of ribs of marine-grade plywood. The designers sketched the benches in Rhino and sent these files to Associated Fabrication, a shop in Brooklyn, N.Y., outfitted with CNC systems.

The folks at Associated refined the Rhino models and plugged them into their machines. It was simple enough to cut the profiles of the plywood ribs on a CNC router, but thermoforming the solid surface proved to be more of a challenge. While the material is plastic, it does have restraints in terms of how tight a radius it can be used to form—it starts to come apart as it approaches a 90-degree angle—and Urban Movement's design called for some pretty tight radii. To solve this problem, Associated came up with a system of cutting groves into the surface of the material that allowed them to get more drastic curves without compromising the material's structure. They made molds of the benches out of MDF—also cut on a CNC router—and then heated the solid-surface sheets to 350 F, rendering them as pliable as rubber. "To heat [them], we use a platen oven," says Jeffery Taras of Associated Fabrication. "It's a big drawer, and the top pneumatically lowers on to the … [material], so that the material is in constant contact with uniformly heated aluminum platens." The heated material was then drawn down over the molds on a membrane-press vacuum table and allowed to cool.

The digital-fabrication process made it easy and affordable to create one-to-one mock-ups during design, a key to getting the benches right. "It was an ongoing process," Gluck says. "Associated would do a mock-up, and then we would go in and test them with our bodies."

Flatform
Marble Fairbanks

The 2008 show at MoMA, "Home Delivery: Fabricating the Modern Dwelling" focused on the history of prefabrication in home building. It began with the premise that the practice had been around for a long time—back to balloon framing, at least—and also looked at what new forms of prefabrication might be available to designers and manufacturers eager to leverage technology in home building. In this direction, the museum commissioned New York City architecture firm Marble Fairbanks to design a future wall fragment. "We wound up with a screen wall that would use flap stock metal panels, completely cut in the factory to minimize labor on site,

When designing bus shelters (top) for the 2010 Olympic Village at Whistler, B.C. (the village was also used for the Paralympic Games), Urban Movement Design used solid surfaces to achieve their ergonomic forms. The firm partnered with Associated Fabrication, whose staff thermoformed the solid surface in a platen oven, heating sheets of the material to 350 F and then drawing them down over MDF molds.

Marble Fairbanks' Flatform (middle) is an attempt to generate a future prefabricated wall fragment. The designers joined two panels of 16-gauge stainless steel via laser-cut tabs. Each tab has a sister tab in the other panel (bottom) that it connects to, allowing for assembly entirely by hand.

→

→ and capable of flat packing to minimize shipping costs," says Robert Booth, a project designer at Marble Fairbanks. "We also had a goal of giving it some visual effects that would be strong and come across to museumgoers."

Before coming to that point, however, the designers began their conceptualization by considering a very common contemporary home building material: the metal stud. They were interested in the intelligence embedded in that seemingly mundane object, the way it has quickly changed how homes are designed and built. Specifically, they were impressed by the product's knockouts, which allow the passage of conduit and piping, making the job easier for other trades on site.

Marble Fairbanks wanted to imbed a similar intelligence into its wall, but instead it focused on openness. This openness was created through the mechanism of the wall's connections, which are integral to each surface. It works like this: The screen wall is made up of two 16-gauge stainless steel panels. Tabs are laser-cut across the surface of the panels. The tabs fold 45 degrees toward the other panel. The other panel features a sister tab that folds to meet the first. These two come together to form the connection (no other connectors are needed, and the wall system can be assembled entirely by hand). They also form apertures through the wall, creating the screen effect.

The architects modeled the wall primarily in Digital Project, a 3D parametric modeling program developed by Gehry Technologies that is based on CATIA. "The whole project is two levels of scripting, one level that controls the tab, one that aggregates the connection," Booth says. "One form allowed us to create the connection, the other to manipulate the connections." The program also allowed the designers to play with the connections to create different looks for the screen wall. "There's a lot of flexibility in how the connections can be arranged in the surface," Booth continues. The tab shape and pattern they eventually decided on were chosen for aesthetic reasons; others could have worked equally well.

Digital Project outputs Rhino files, which Marble Fairbanks transferred to AutoCAD files, representing the flat form that would ship from the factory. These drawings were sent to Maloya on Long Island, N.Y., which laser-cut the stainless steel sheets and then had then trucked to MoMA, where Booth and his team performed all the tab bending. "We put in a dashed line allowing the tabs to bend easily and be straight," he says. "All you had to do was push, and it knew where to bend." □

QUIZ

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1. Which of the following 3D modeling programs were used in projects described in this article? (Choose three.)
a. Revit
b. CATIA
c. BIM
d. CNC
e. Rhino
f. Digital Project

2. CATIA allows the designer to:
a. Add intelligence to an object within the 3D model
b. Establish points in space
c. Imbed parts of a model that is governed by rules, or parameters

3. True or False: Rhino is a complex 3D model that establishes points in space and translates the concept into a 2D CAD drawing.

4. Indirect advantages of designing with 3D programs may include:
a. On-site labor can often be minimized
b. Prefabrication of design components
c. Smart packaging and reduced shipping costs
d. Reduced construction timeline
e. All of the above

5. True or False: According to Urban Movement Design, the digital process allows architects to make curved surfaces with great accuracy that will support the body in a healthful way, allowing the muscles to fall into alignment and ensuring that when we do move, we do so from a place of comfort, not stress.

6. The benches and bus shelters designed by Urban Movement Design for the Whistler Olympic Village:
a. Provide a surface that morphs throughout its length, encouraging the user to sit with his or her back straight.
b. Flex under the weight of the sitter, causing the body to use the abdominals for support.
c. Have an antimicrobial finish on the surface to help prevent the spread of bacteria

7. True or False: In the "Light Frames" project, the 3D model was used to design the metal structure and as a reference in the shop.

8. The "Light Frames" project used CATIA. This program broke down the model into:
a. Several 2D forms
b. A series of shapes that could be cut from sheets of vinyl
c. A schedule of pieces to be CNC laser-cut

9. True or False: The architects used RhinoNest to design the Flatform wall panels.

10. When designing the Flatform wall panels, the 3D program allowed the designers to:
a. Play with the connections to create different looks
b. Easily modify the size, shape, and placement of the cuts in the steel
c. Calculate the transparency value of the screen based on the number of cuts to be made in the steel

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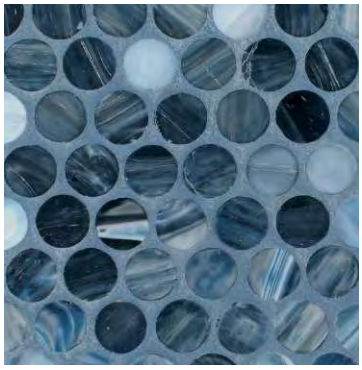
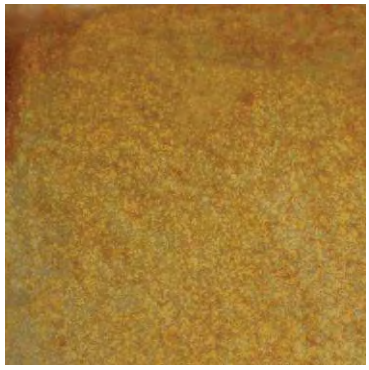




EDITED BY LAURIE GRANT

Austrian artist Manfred Kielnhofer's **Interlux Chair** doubles as a light source. Made of plexiglass tubes with a flat plexiglass sheet for the seat and back, the chair features neon tube lights thread through the arms. These lights can be changed based on what colors are desired. This is not the artist's first foray into furniture design: He also created a chair constructed from cardboard tubes manufactured out of recycled newspaper. • *kielnhofer.com* • Circle 105

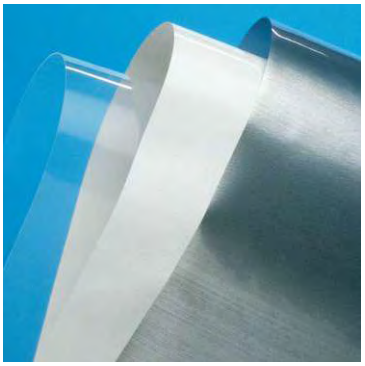
Nanook, a wooden side chair from **Moroso**, was inspired by molecular geometry, and borrows a hexagonal framework from such natural phenomena as snowflakes. Designed by Philippe Bestenheider, the chair has a steel frame and a bent-plywood seat, which can be covered by upholstery or by decorations printed on the wood using Maravee, a 100% sustainable solid paint. The collection also includes an armchair and low table. • *moroso.it* • Circle 106

Magnetic Laminates from **Chemetal** is a collection of eight laminates for communications areas in interior settings. To make the laminates magnetic, a thin layer of iron foil is integrated into a high-pressure laminate backer. The panels can be finished as a dry-erase board (shown), chalkboard, projection board, painted, or with other Chemetal standard finishes. They are available in 4' by 8' sheets and are 0.04" thick. Each sheet weighs 18 pounds. • *chemetal.com* • Circle 107

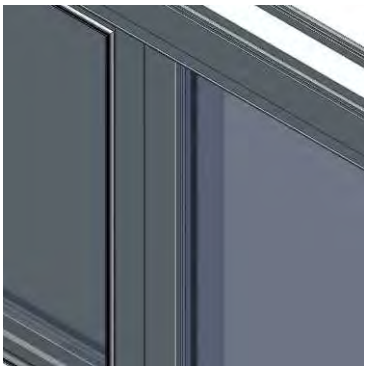
Made with recycled opaque glass, **Stone & Pewter Accents' Marbleized Penny Rounds** are offered in 13 colors with pearl or silk finishes. The tiles are hand poured and feature slight variations in color, tone, and shade. The tiles come on paper-faced sheets that are 0.98 square feet, and the thickness of the tiles ranges from 5.5 to 6 mm. The marbleized glass tiles are also available in square and brick mosaic options. • *stonepewter accents.com* • Circle 108

VeroMetal Corten-Stahl panels resemble Cor-Ten steel. Substrate materials comprise various plastic and glass-fiber-reinforced materials that are coated with VeroMetal Iron, a cold, sprayable metal than gives the appearance of a hot-cast material. The surface continues to oxidize like Cor-Ten, or a sealant can be applied to preserve the color. The panels are suitable for indoor and outdoor use, and the substrate can be formed so that various shapes can be created. • *verometal.de* • Circle 109

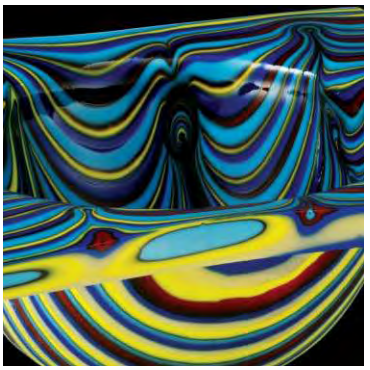
The **Uponor Radiant Rollout mat** is a network of cross-linked polyethylene (PEX-a) tubing for radiant heating and cooling. The mat consists of Wirsbo hePEX (oxygen barrier) or Uponor AquaPEX (nonbarrier), which is a tubing connected with ProPEX-engineered plastic fittings that are safe for burial in the slab and offer fast on-site construction. The length is customizable and widths include 4 ½', 5', and a 10' double-mat option. • *uponor-usa.com* • Circle 110



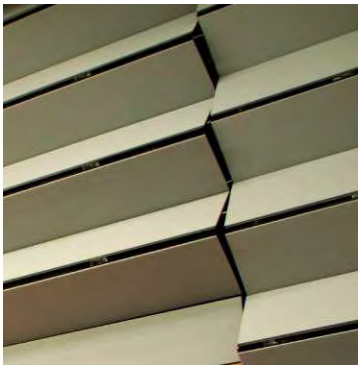
Arkema's **Kynar film** can be used for photovoltaic back sheets and top sheets and be thermoformed into panels for façade and roof-panel applications. The film is resistant to weathering, stains, and graffiti and provides long-term UV protection. It also resists moisture and environmental pollutants. The low surface energy of the film provides excellent dirt-shedding properties. • *arkema-inc.com* • Circle 111



Wojan Window & Door has added the **M-950** series of horizontal sliding windows to its line. The aluminum windows have a 3 ¼" frame depth and are available in end-vent, single-vent, and center-vent configurations. The enhanced-design thermal break and available high-performance glass increases the energy efficiency. Standard finishes include bronze or white, bronze or white Kynar, and clear and bronze anodized. • *wojan.com* • Circle 112

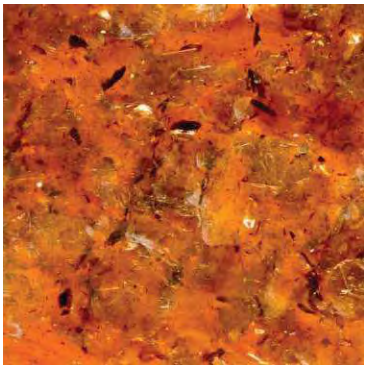


Meyda Custom Lighting is using its expertise in glasswork in areas of the built environment other than lighting. Their new **Custom Fused Glass Bowls** are for use as kitchen and bath sinks for commercial, retail, hospitality, and residential environments. The custom-made bowls feature myriad color, design, and size options. The kiln-fired Tropical Fused Glass Bowl (pictured) stands at 4 ¼" and is 15" wide. • *meyda.com* • Circle 113



Skyfold has introduced two new operable partition systems, **Skyfold Classic Elite** and **Skyfold Classic NR**. Designed to separate rooms, such as in a hotel meeting-room setting, Classic Elite has an STC of 57 and can be used in applications up to 28' high, and Classic NR has an STC of 50 and an NRC of 0.65. Classic NR can be specified up to 34' high and in unlimited lengths. The retractable partitions feature internal hinges, double perimeter seals, and fully automatic operation. • *skyfold.com* • Circle 114

Traüllit and **Form Us With Love** have created **Hexagon**, a collection of hexagonal discs in various colors that can be used on interior walls. The collection is wood-wool cement board, which is manufactured by cutting wood slivers from logs and then mixing it with water and cement. The material is then put into a mold and allowed to dry. The boards are resistant to water and moisture and have sound-absorbing qualities. • *formuswithlove.se* • Circle 115



Acrilex has added the **Acriglas Minerals series** to its line of acrylic sheets. Composed of 20% muscovite mica flakes, the weather-resistant line is available in a variety of sizes and in thicknesses ranging from ⅛" to ½". Color options include sandstone, black galaxy mica, white quartz, Indian amber, amethyst, wisteria mica, garnet, and natural mica. • *acrilex.com* • Circle 116

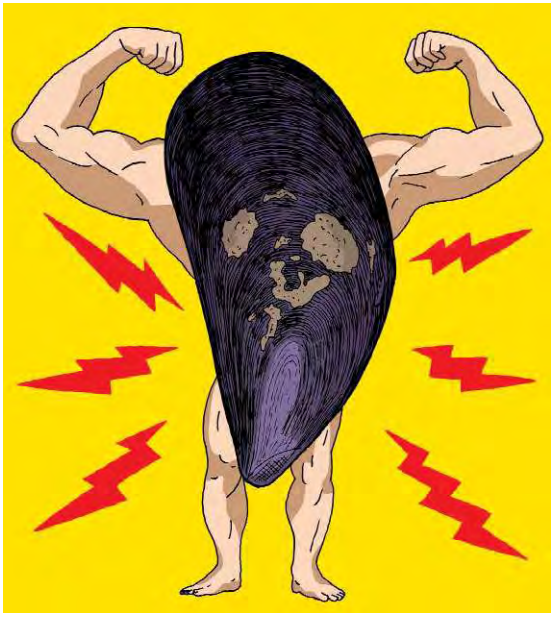
100,000
linear feet

The amount of radiant heating tubing that Uponor installed in the 38,000-square-foot exhibition area of the Renzo Piano–designed California Academy of Sciences. That translates to 18.93 miles, or long enough to run from the front of the museum to the top of the troposphere and back, with enough left over to walk through the museum's exhibits.

→MIND & MATTER

Strength in Mussels

WHAT CAN MAN-MADE ADHESIVES DRAW FROM NATURE'S STRONGEST, CLEANEST GLUES?



2 to 5 times higher

LEVELS OF VOLATILE ORGANIC COMPOUNDS INSIDE HOMES VERSUS OUTSIDE HOMES

SOURCE: U.S. ENVIRONMENTAL PROTECTION AGENCY

ARCHITECTS TEND TO PAY MORE ATTENTION to materials than to the substances holding them together. However, increased attention to material chemistry has encouraged greater scrutiny of adhesives used in building construction. Necessary components in assemblies and composites, adhesives provide important functionality—yet they often consist of synthetic chemicals that off-gas during curing, leading to negative consequences for human and environmental health. LEED and other green rating systems focus on the reduction of volatile organic compounds (VOCs) in adhesives as well as other materials, yet one wonders why these substances must off-gas at all.

The biomimicry movement has inspired a search for more environmentally friendly adhesives that perform as well as or better than conventional products. The strength and resilience of natural glues secreted by mussels, for example, have long baffled scientists. Capable of resisting constant pounding by ocean waves, mussels' forceful grip is due to the secretion of byssal holdfast fibers—the focus of recent analysis by researchers from the Max Planck Institute of Colloids and Interfaces in Germany. Other examples include the tenacious yet repositionable attachment of beetle feet on waxy surfaces, made possible by a combination of tiny bristles and tarsal oil; or a similar functionality exhibited by gecko lizards, whose feet possess millions of keratinous setae—tiny hairs that adhere to various surface profiles. Despite offering differing degrees of permanence, all of these examples share the application of large numbers of small fibers that form attachments without polluting the environment.

In January, University of Chicago scientists announced the capability of synthesizing these fibers. The key to their success is due to the use of metals, which form strong and flexible bonds—as opposed to the strong yet brittle covalent bonds of conventional adhesives, which create irreversible attachments. Working with a long-chain polymer developed by Northwestern University, the University of Chicago adhesive is able to cure underwater and repair itself within a matter of minutes. "These metal bonds are stable, yet if they break, they automatically self-heal without adding any extra energy to the system," Niels Holten-Andersen, a postdoctoral scholar, told press at the time.

Ka Yee Lee, co-author of an article published in the *Proceedings of the National Academy of Sciences*, claims that the material properties of the new adhesive may be tweaked by altering the pH or by adding different types of metal ions. "You can tune the stiffness, the strength of the material, by now having two knobs," Lee says. "The question is, what other knobs are out there?"

Still in the testing phase, the new adhesive could prove to be superior to synthetic materials in terms of its mechanical performance, adaptability, and lack of negative influence on human and environmental health. According to Holten-Andersen, "Our aspiration is to learn some new design principles from nature that we haven't yet actually been using in man-made materials, that we can then apply to make man-made materials even better. A lot of our traditional materials are hard to get rid of once we're done with them, whereas nature's materials are obviously made in a way that's environmentally friendly." □

TEXT BY BLAINE BROWNELL, AIA
ILLUSTRATIONS BY PETER ARKLE

→ Read more of Blaine's reports on cutting-edge tech at ARCHITECT's Mind & Matter blog: go.hw.net/Brownell.

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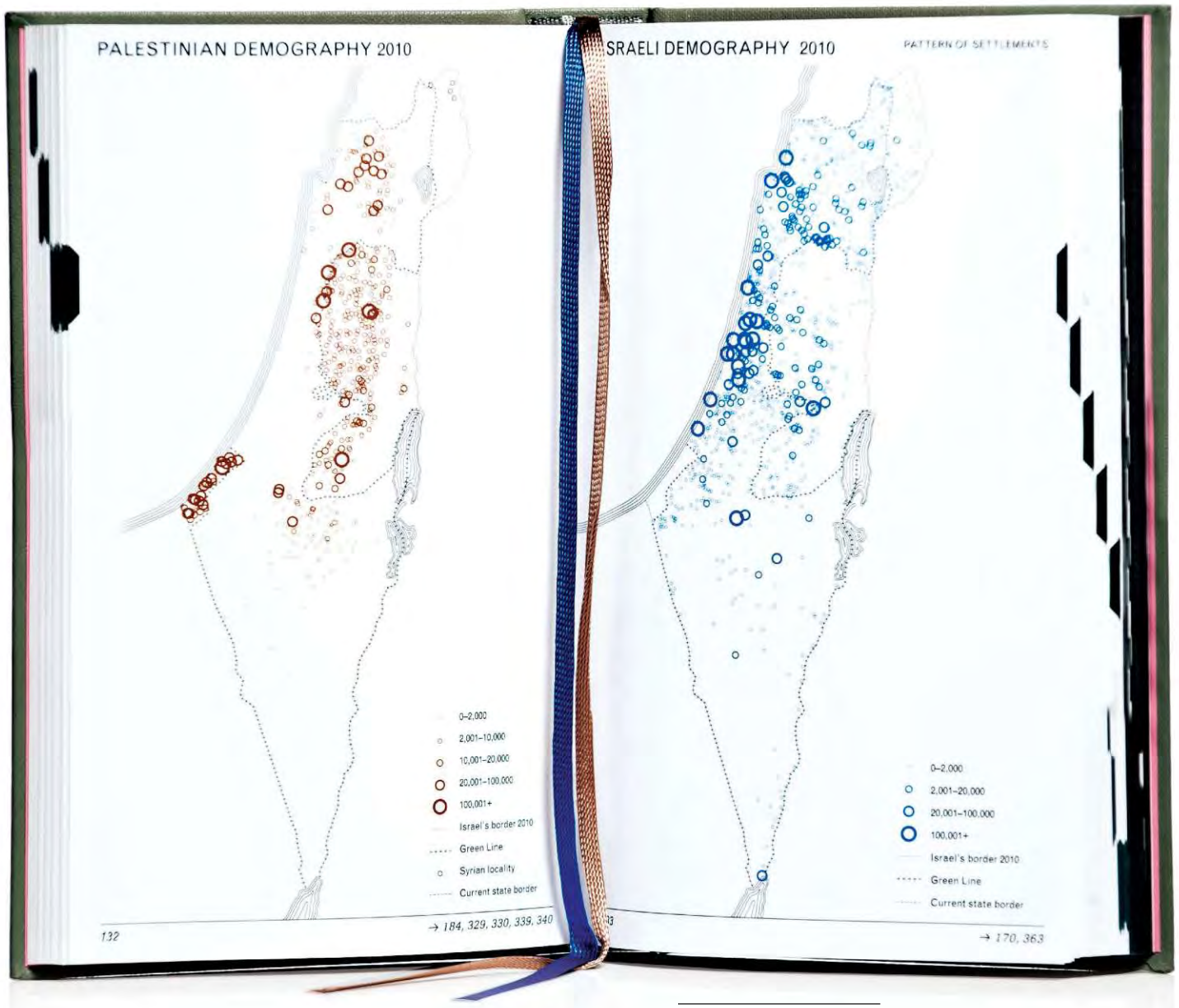
CULTURE



EDITED BY LINDSEY M. ROBERTS

→BOOK

In 500-plus maps, Malkit Shoshan's **Atlas of the Conflict: Israel-Palestine** tracks the geographic fluctuations of Israel from the Iron Age to today. Palestinian territory has typically declined in proportion to Israeli growth along various vectors: e.g., Israeli archaeology waxes where Palestinian populations wane. The maps present the conflict as it has unfolded, revealing a war waged through geography—with settlement typology playing as significant a role in the fates of Israelis and Palestinians as the wall now separating them. • $51.50; 010 Publishers

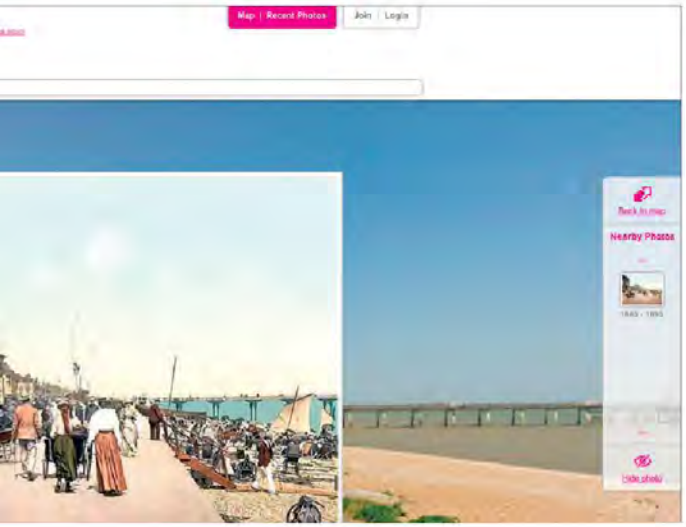
→OBJECT

Take a present-day tour to the San Francisco International Airport to get a glimpse of what 19th-century grand-tour-goers saw. Take in Trajan's Column, the Bank of England, Rheims Cathedral (shown, as a bronze clock on an inlaid rosewood stand, ca. 1820), and other monuments—marbled, silvered, gilded, and all as pocketable as postcards. **Grand Miniatures: 19th Century Souvenir Buildings from the Collection of Ace Architects** displays the best of the Oakland, Calif., firm's 35-year-old collecting hobby. Twenty vitrines, each with icons from one city, are spread throughout the international terminal until May. After that, you'll have to travel like it's 1899 to see these architectural wonders.• *flysfo.com*

PREVIOUS PAGE: MIKE MORGAN;
LEFT: COURTESY ACE ARCHITECTS; RIGHT: COURTESY SAVE A SAMPLE

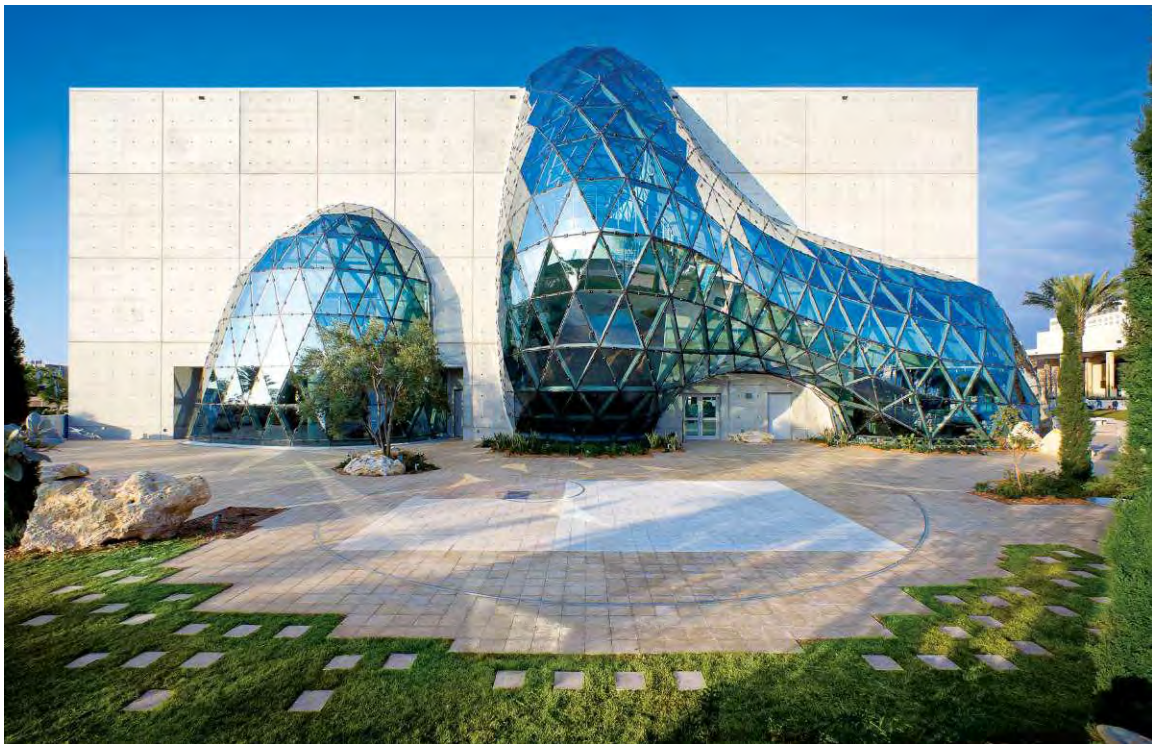
→WEBSITE

We Are What We Do, a U.K. collective that engages people in activities for the greater good—one of its books is titled *Teach Your Granny to Text and Other Ways to Change the World*—has partnered with Google Maps to create **Historypin**. An effort to encourage intergenerational conversation, Historypin invites everyone to upload their photos, tag them by location (anywhere on Earth) and year (back to 1840), and provide the story behind each image. A free Google account is necessary to participate, but anyone can browse the map and see what's already in the database. • *historypin.com*



→EVENT

Every architecture firm has a product library, so it follows that every architecture firm is overflowing with materials samples. With spring cleaning around the corner, consider sparing the landfill and instead donate those fabric swatches and marble specimens to **Save a Sample**. Since 1999, the program has redistributed 10 tons of materials from firms in Boston, Chicago, Philadelphia, New York, San Francisco, and Washington, D.C., to worthy design schools for students to use in their projects. April 5–7. • *specsimple.com*



→CRIT

Truly Surreal

WHAT'S STRANGER THAN STUMBLING UPON A TROVE OF SALVADOR DALI'S ART IN TAMPA? THE NEW MUSEUM THAT HOUSES IT, SAYS THOMAS DE MONCHAUX.

"THE FUTURE OF ARCHITECTURE," Salvador Dalí famously prophesied, "will be soft and hairy." The occasion was a self-reported conversation that the ubiquitous surrealist artist had with that other unavoidable figure, Le Corbusier, in 1922. The context was a 1933 essay by Dalí about, well, Dalí, but nominally about modern architecture and food—neither of which, notably, much benefits from hair. "In listening to me," Dalí was pleased to report, "Le Corbusier had the look of one who had swallowed gall."

Gall, in the sense of all that is impudently bilious and hard to swallow, is by now often a critical measure of architectural success: The modern future arrives, by definition, disruptively, unpalatably, and as more a matter of vegetables than cake. Now an architectural future has arrived in St. Petersburg, Fla., in the form of a new home for that city's Salvador Dalí Museum, completed this January by Yann Weymouth, AIA, of HOK. The $32 million building doubles to 68,000 square feet the former museum's size, arranging the familiar array of café and bookshop and auditorium on the ground floor, administrative offices on second, and (secure on third, above flood levels of the adjacent Tampa Bay), the largest collection of Dalí's art and artifacts outside of the artist's own self-designed monographic museum in his hometown of Figueres, Spain.

That museum, which opened in 1974 in the converted ruins of a theater bombed during the Spanish Civil War, features a vast geodesic dome skylight illuminating a quasi-medieval fortress tower—a testament to the mutual admiration between Dalí and his equal-and-opposite in prophecy, Buckminster Fuller. A seemingly melting geodesic sphere, dubbed "Enigma" in honor of a Dalí painting of that title, is the most striking feature of the new Florida museum. Its surface of triangulated glass, hurricane-proof at some 1 1/2 inches thick, appears to flow in and out of the rectilinear body of the museum, a concrete bunker entered, in the manner of Louis Kahn's Yale Center for British Art, under a deep overhang at a corner.

Within, the Enigma encloses a pleasantly ellipsoidal 75-foot-high central atrium, at a possible centroid of which arises a graceful and structurally ingenious spiral staircase, which references, PR materials report, the double helix of DNA. The staircase reverses certain tectonic expectations: It is supported only at its end points, features dramatically cantilievering treads, and tops out with a quasi-Borrominian flourish in which the concrete balustrade delaminates from those treads and coils further toward the sky. The third-floor galleries, somewhat more decorous, are illuminated by gratifyingly Corbusian light cannons, which direct and refine the abundant Florida light. The 18-inch thickness of the bunkerish concrete walls protects the valuable collection from Category 5 hurricanes, and in an example of sensible sustainable

→

TEXT BY THOMAS DE MONCHAUX
PHOTOS BY HOK/MORIS MORENO

Architect and writer Thomas de Monchaux was the inaugural recipient of the Winterhouse Award for Design Writing & Criticism. He teaches at Columbia University.

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details found throughout, provides a substantial thermal mass that moderates the mechanical environmental tempering required by St. Petersburg's heat and humidity.

IN AMERICAN HIP HOP, of which nearby Tampa is a notable regional center, the term "alphabet boys" refers to acronymed agencies (such as the ATF and FBI) that take an interest in the not always legally sanctioned work of small-scale urban entrepreneurs. Similarly, there is a standard narrative in the creative cycles of American architecture in which the sensibility and formal language developed by furtive futurists, under pressures of academy and poverty, filter up and out to the work of the corporate alphabet boys: HOK, SOM, KPF, and their ilk.

HOK, masters of the Far East skyscraper and Middle East masterplan, could seem at first a lamentably alphabetic choice to design a museum for an artist who, at first glance, still carries with him an aura of the avant-garde—similar to how, for all his unimpeachable talents, the semi-alphabetical I.M. Pei, FAIA, provided perhaps too much adult supervision in his 1995 design for Cleveland's Rock and Roll Hall of Fame and Museum, which really should have gone to some architectural rolling stones. It would be nice to imagine that, here, the subversion of a Salvador Dalí had crept deeply into the ostensibly middlebrow manners of an alphabet boy and resulted in, well, something special.

This sort of narrative would do a disservice both to the work of Dalí and, in this particular project at least, to HOK. Over his long career, Dalí perfected not the eyeball-slicing or cerebrum-stimulating Surrealism of his earliest contemporaries, Luis Buñuel and Marcel Duchamp, but a

Insulated reinforced concrete walls (left), 18 inches thick, provide thermal mass for the museum building. Capping the museum's atrium and café is Weymouth's irregular geodesic dome, the "Enigma" (middle). Underneath it, the spiral stair in the atrium (right), inspired by strands of DNA, is supported only at the bottom and at the third level.

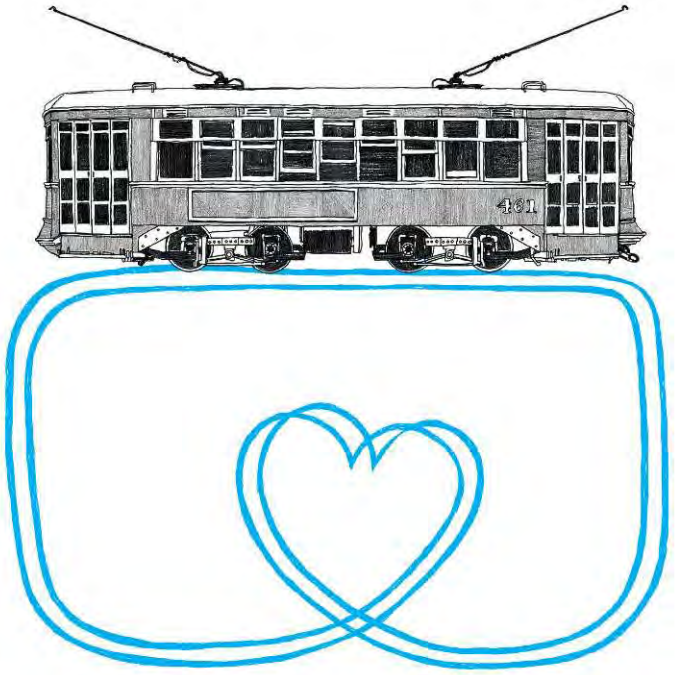
deeply palatable body of technically perfect, aesthetically accessible works, whose portentous and poster-ready combination of cheese and bathos found its way straight into the heart of global bourgeois taste. Compared to that, HOK is the edgy one in this partnership.

What adds the edge here is Weymouth's seemingly casual choice to apply to the building versions of the high-end finishes and material vocabulary that we associate with architects of either solemn spirituality, from Tadao Ando to Peter Zumthor; or technocratic purism, from Norman Foster to Renzo Piano. The smooth poured-in-place concrete walls feature the familiar array of rough ridges and gridded plug-dots we recall from a Kahn museum; the somberly high-tech powder-finished panels and vents and glazing gadgets send us to Foster's British Museum.

To see these precise formal languages, and their very particular aura of associations, show up here within the context of Florida and Dalí profoundly and subversively alienates them from their vocabularies of signifiers and signs, in a way that is truly—and debatably beyond the capacity or intention of artist and architect—Surreal.

But is it soft? Is it hairy? Certainly soft, not in the almost-now-retro blobbishness of the tessellated glazing, but in the cosy and forgiving nature of the art it encloses. And certainly hairy, not in any sense of ostentatiously risky bravura, but in elegantly celebrating the rather twist-and-turn story of patronage and collection that brought that art to Tampa/St. Petersburg, known both as the Strip-Club Capital of America and as God's Waiting Room.

The result is a project that is irreproducible in its alignment of intention and serendipity, in which, perhaps for once, the biomorphic and embodied, the corporeal and the corporate are all perfect for each other. □



→**LETTER FROM NEW ORLEANS:** PART ONE OF THREE

A Desire Named Streetcar

WHAT THE OLDEST OPERATING TRANSIT SYSTEM IN THE U.S. CAN TEACH US ABOUT PLANNING FOR TOMORROW.

TEXT BY WAYNE CURTIS
ILLUSTRATION BY LAUREN NASSEF

THIS PAST JANUARY, the Federal Transit Administration signed an agreement with the New Orleans Regional Transit Authority for $45 million in federal economic stimulus funds to build a new, 1.5-mile streetcar line. It would link Canal Street with the Union Passenger Terminal, a 1954 structure that's now home to the Amtrak and Greyhound stations.

Skeptical New Orleanians wondered why. Of course, connecting to a regional transportation center was a sensible thing. But the line passed block after block of bleak, asphalt-savanna surface parking that flanks partially filled office towers. Why not route the new streetcar through communities that already had a denser residential population?

The answer came pretty quickly. Routing the streetcar through an underused part of the city, it turned out, was like adding water to sea monkeys. The blocks came to life almost immediately.

The Domain Companies, a developer specializing in mixed-use developments with projects in New York and Louisiana, announced that four of those empty blocks would soon give rise to some 450 new apartments and 125,000 square feet of retail and restaurants. Other projects also quickly took root in the area: An auto dealership would be converted into a much-needed downtown supermarket, and the 1,193-room Hyatt Regency New Orleans, which sits just north of the new streetcar line and has been empty since Hurricane Katrina, started getting a $243 million overhaul. The area even got a new name: the South Market District.

"What we felt made this site ideal," Matt Schwartz, principal of Domain Companies, told *The Times-Picayune*, "was the streetcar expansion."

If all goes well, the South Market District will be a textbook example of how transit-oriented development (TOD) is supposed to work. Bring in transit, and builders of higher-density residential and retail will follow.

Yet listen carefully, and you can hear an echo in New Orleans. Because bringing TOD to New Orleans is a bit like telling Chicago about these tall buildings called skyscrapers. A popular bumper sticker here gets it right: "New Orleans: So Far Behind We're Ahead."

In New Orleans, transit and development have always gone hand in hand. It's home to one of America's earliest urban transit systems—in 1835, horse-drawn cars on tracks starting making the trip from Canal Street some five miles upriver to the new town of Carrolton, which was being carved out of old plantations. Those

NOT A SINGLE CITY TRANSIT PLAN HAS TAKEN UP WHAT MAKES A TRIP TRULY ENJOYABLE FOR PASSENGERS.

who established the St. Charles line implicitly understood TOD, even before the acronym came along. The backers assumed the line would trigger development, and among the boosters were those who sought to sell lots along the way. It worked. The Garden District (among other neighborhoods) was born.

The New Orleans experience also helps answer a common question among transit planners and cash-strapped municipalities: Why streetcars? Why not just expand bus routes? They're cheaper, more flexible to route, and far quicker to implement.

The short answer: because where streetcars go, people follow. People simply like streetcars better than buses—studies suggest that ridership typically increases by about one-third when streetcars replace a bus route. They're smooth. There's less lurching. And there's less uncertainty about where they end up.

Developers like the permanence of streetcars. Nobody invests in a retail complex or apartment building because it's near a bus stop—that could move next week. But streetcar systems, which cost on the order of $40 million a mile, are viewed as longer lasting, certain to be around for at least a generation. You can put money on them.

THERE'S ANOTHER REASON that is perhaps underappreciated in policy circles: Streetcars have charm. The streetcars serving the St. Charles line today are chiefly 900-series Perley A. Thomas cars, built in High Point, N.C., in the early 1920s. Their distinctive look, feel, and sound have created a coterie of fans. The St. Charles streetcar is one of the few mass-transit systems to earn four-and-half stars on Yelp—or get any attention at all, for that matter. The 74 reviewers enthuse about the cars as if they were an undiscovered diner.

"There's something about the smell of streetcar wood that just takes you to another era, and I love feeling the breeze through the open windows," wrote a visitor from San Francisco. Another from South Pasadena, Calif., wrote that this was "The first public transportation I didn't hate."

And it's not just starry-eyed Californians. New Orleanians love them, and the cars attract commuters as well as tourists. "It's impossible to be unhappy when you're on the St. Charles streetcar," wrote a local resident. Another suggested qualified love: "Consistent in its inconsistency. Dangerous in a yesteryear fashion. But as distinctive and charming as some seasonal berry sorbet."

Darrin Nordahl is the city designer for Davenport, Iowa, and the author of *My Kind of Transit*. In that book, he takes a long look at American cities—particularly New Orleans, Seattle, San Francisco, and Pittsburgh—where visitors and residents alike have fought to keep their streetcars, cable cars, monorails, and funiculars operating. Nordahl writes that he had an epiphany in Hong Kong, while riding the funicular. "Public transportation here was not just a means to a destination, but a destination itself."

Nordahl has read through a great many transit plans for cities large and small. All these plans focus on issues such as headway (timing between cars), geographic coverage, ridership, and "passenger miles traveled." But not a single city plan has taken up the issue of what makes a trip truly enjoyable for passengers. As Nordahl writes, "The experience offered to the passenger—the 'fun-factor'—did not seem to weigh anywhere within transportation proposals."

He believes they should. "Once upon a time, traffic engineers told us how we should design a street," Nordahl told me. So streets ended up being what one writer has referred to as "traffic sewers"—concrete sluices designed strictly for cars. That attitude has changed. "Now there's this movement all across the country where we're redesigning streets—they're narrower, and travel is slower, but they're very inviting and comfortable for pedestrians," he said.

Much the same approach could be applied to transit, he suggested. Nordahl singles out the St. Charles streetcar as a good example. Like a narrow street full of intriguing storefronts, the streetcar has an almost baroque complexity of textures and materials: leather, steel, brass, mahogany, dangerously wide-open windows. (Compare this to the bus interiors of plastic with a few steel accents, and sealed windows, at times covered with billboard-sized advertising that permit only dim and blurry views of the outside—treating the customer like Spam in a highly decorated can.)

The St. Charles streetcar line is an exception in many ways. It's listed on the National Register of Historic Places and is thus exempted from meeting a number of modern standards (such as handicapped accessibility; heat and air-conditioning; windows that open just a few inches). But it and other streetcars suggest that paying attention to the experience is not just an exercise in feel-goodism. It makes practical sense, in part by attracting "premium riders." These are people who take public transit not because they lack other options, but because they choose to leave their cars behind. That's a benefit for all, since it spreads the costs more widely, allows popular lines to underwrite routes in less popular or populated areas, and reduces the stigma of public transit. Everyone wins. □

→STUDIO VISIT

Antoine Predock Architect

THE MASTER OF SOUTHWEST MODERNISM HAS SPENT FOUR DECADES BUILDING A STUDIO CAMPUS IN ALBUQUERQUE. HIS OFFICES DOUBLE AS GARAGES FOR HIS MOTORCYLE COLLECTION: PREDOCK IS ALWAYS READY TO HIT THE ROAD.

TEXT BY KRISTON CAPPS
PHOTOS BY TIMOTHY HURSLEY

Despite the fact that Predock (above) wears his arm in a sling after suffering an injury in a motorcycle accident, he is committed to riding—and keeping bikes as design objects. He says they've played a role in his life since his childhood and recalls riding them around Europe as a student. "Inanimate objects can have a meaning far beyond their technology. Certain bikes do that," Predock says, noting the Vincent Black Shadow and Ducati F1 among his favorites. "They're inspiring to have in the studio for me. There are lessons in them."

The workstations in Predock's Albuquerque, N.M., studio (left), which accommodates a staff of 11, include desks made from 2x4s and solid core doors. The emphasis on natural simplicity is key to Predock's embrace of modernist materials and metaphors. One of the 2006 AIA Gold Medalist's favorite metaphors inspired the title of a new monograph of his work: *Roadcut*, which refers to "a sectional diagram of the earth ... revealed through man's intervention." *Roadcut* author Christopher Mead and Predock's graphics director, Mira Woodson, curated a corresponding exhibit of Predock's work for the University of New Mexico Art Museum.

Since he opened his office (above) in 1967, Predock has acquired adjacent commercial properties to build out his campus. Greenery is a significant feature of the complex's six buildings, which feature both indoor plants and outdoor gardens. In that sense, Predock's campus sticks out in a neighborhood populated by "Midwestern, front-porch typologies"—buildings that Predock describes as evocative of a California bungalow look from the '10s and '20s. The designer says that he did not have a scheme for the studio's "accretion," which is characterized by walled enclosures that link the buildings together. "I never had a particular master plan," he says.

"There are models everywhere. The practice is 3D from the beginning," Predock says. One of the galleries in the exhibition at the University of New Mexico Art Museum (on view through May 22) is dedicated to Predock's models and design drawings; the model shown above is of the ballpark he designed for the San Diego Padres. "I make clay models that evolve into digital models. Models are the essence of the studio, always have been, always will be."

IWAN BAAN, COURTESY STEVEN HOLL ARCHITECTS

Steven Holl's Linked Hybrid in Beijing (above) exemplifies the truly unprecedented scale at which architects are working in China.

→BEYOND BUILDINGS

Meet the New Boss

CHINA IS A GREAT OPPORTUNITY FOR U.S. ARCHITECTS—SO WHY AREN'T THEY DOING BETTER WORK THERE?

"LIKE RINGS FROM A STONE dropped in a pond, curving walls create a journey and define space." Is that kind of pablum the best of what America has to offer global architecture? It is, if you can believe *The New York Times*, which quoted Seattle architect Stuart Silk, AIA, thusly describing the villas he is designing in Shanghai. From the one photograph the Gray Lady printed, the buildings look as bad as they sound. The article goes on to illustrate other mediocrities, while making a few nods to more avant-garde offerings by the likes of Steven Holl, AIA, concluding that, guess what, architects complain as much about their Chinese clients as they do about the ones that put them to work stateside.

The article makes an interesting contrast to a recent report in *Fortune* that American and European firms are contributing to the construction of ghost cities throughout China and Asia. It describes "massive cities that the Chinese government is in the process of building in the hopes that people will come. But the people have not come." Which leads me to wonder: Are Western firms making a worthwhile contribution to China's development?

The easy answer is that architects go wherever they can obtain a commission and do whatever they are capable of designing. Most of what is rising in China to designs produced by American and European architects is ugly, wasteful, or just plain mediocre—it is no different than what architects produce in their native countries. As noted above, I am sure most of them blame not themselves but the clients for that situation.

What is different is the scale on which this is occurring. While most architects only have the chance to build a few structures in their native country, in China they can decree whole neighborhoods, skyscrapers, and even cities, and see them come to completion in a few years. I am afraid that I have not seen many of these structures that I think are any good. The realities of constructing in China—a situation that is, truth be told, changing quickly—often makes them less than successful. Though some of Steven Holl's Chinese projects look quite interesting (I have not seen the Vanke Headquarters in reality), for instance, I am afraid that the Linked Hybrid in Beijing looks like a collection of fairly banal, poorly constructed apartment blocks connected with the kind of sky bridges we banned a long time ago in most American downtowns. It is big—millions of square feet of repetitive grids of what was an appealing sketch.

According to *The New York Times* article, Chinese clients are "more ambitious, more adventurous and even more willing to spend the money necessary to realize the designs." According to Chris McVoy, of Steven Holl's office, "There is an appreciation of non-materialist ideas, a connection to history and culture and especially meaning. They drive towards a solution, but there is also a metaphysical dimension." That, if it is true, is great.

Given that Chinese commissions allow American architects to build at a scale and with a speed that they have not had in the U.S., you would think that the chance to build truly great architecture there is immense. I am waiting for such great results, but I bemoan the mediocrity and waste of natural resources and land to which many American architects are now contributing. □

TEXT BY AARON BETSKY
ILLUSTRATION BY PETER ARKLE

→ Read more of Aaron's design observations at ARCHITECT's Beyond Buildings blog: go.hw.net/Betsky.

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BUILDING: REPUTATION

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Jesus De Anda, 26
Third-year B.Arch.

De Anda will be the first member of his family to graduate from a university. He appreciates the diversity of Woodbury's Burbank, Calif., campus. "There's a heavier presence of Hispanic culture. It shows that more Spanish are getting involved with architecture."

TEXT BY MARK LAMSTER
PHOTOS BY MARK MAHANEY

THE FUTURE BELONGS TO WOODBURY

TO WHERE? THIS UNIVERSITY IN SOUTHERN CALIFORNIA HAS A LITTLE-KNOWN ARCHITECTURE SCHOOL WITH BIG AMBITIONS. MOST OF ITS STUDENTS BELONG TO A MINORITY GROUP AND ARE THE FIRST IN THEIR FAMILIES TO ATTEND COLLEGE. THE SCHOOL HAS RECEIVED MILLIONS OF FEDERAL DOLLARS TO EXPAND ACCESS EVEN FURTHER. DOES WOODBURY EXEMPLIFY A DEMOGRAPHIC REVOLUTION IN ARCHITECTURE?

IF YOU'RE LOOKING FOR IT, which seems unlikely, you will find the main campus of the Woodbury University School of Architecture on the site of a former convent in a nondescript section of California's San Fernando Valley, where Burbank and Los Angeles meet. Though the back lot of Universal Studios is just a few minutes' drive away, this isn't the landscape of Hollywood's dream machine.

The landmark closest to the school is the weedy, fenced-in tarmac of Bob Hope Airport, a regional alternative to LAX. Woodbury may be in the great trough that is the San Fernando Valley, but it's in the valley of working-class immigrant families and, like, totally *not* in the cliché valley of airhead blondes driving pink Mercedes convertibles.

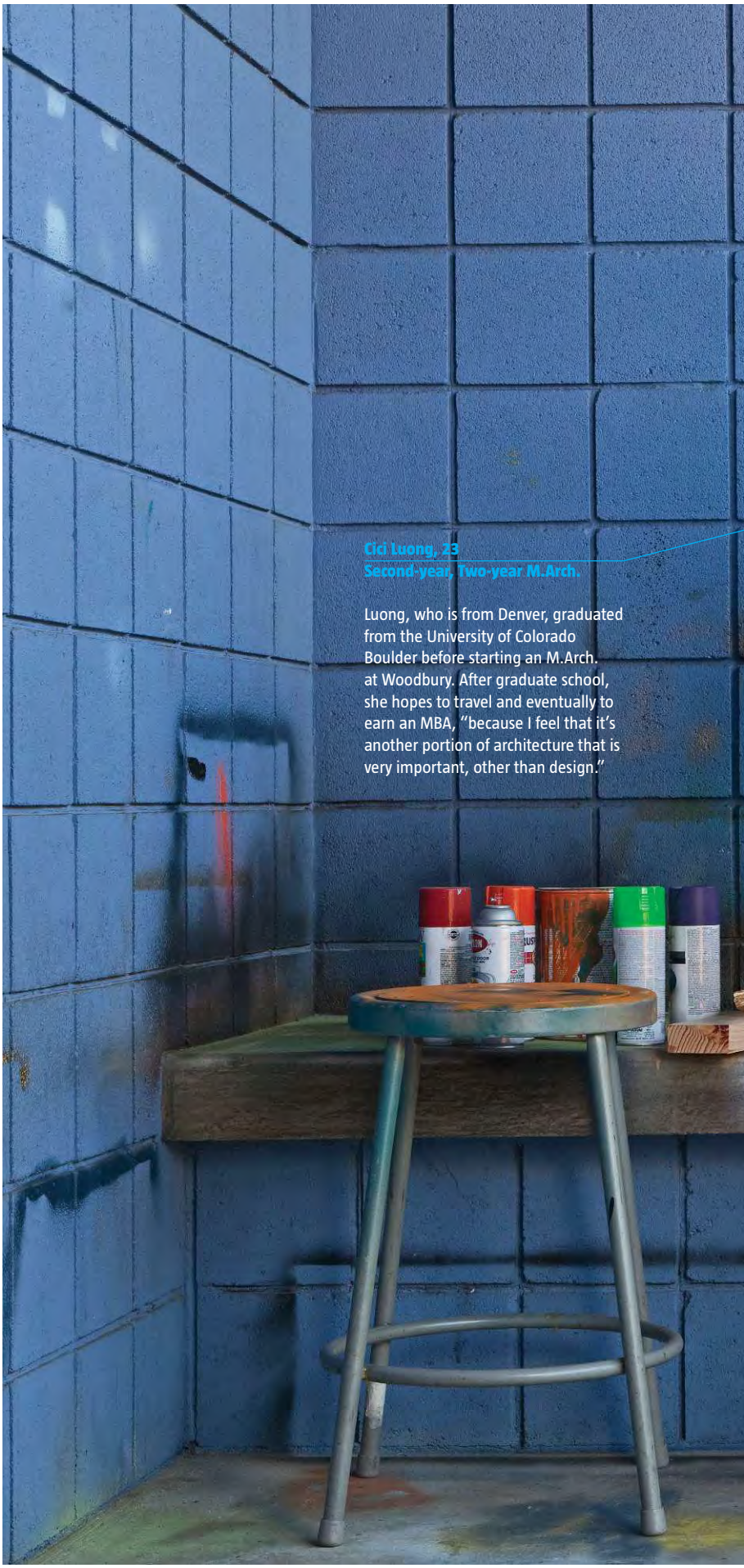
Woodbury's physical remoteness is a near-perfect metaphor for its invisibility within the architectural profession. When I asked a series of East Coast and even West Coast practitioners what they knew of the place, the answer was, uniformly, "nothing." Even the local indie paper, *LA Weekly*, recently called it the "best architectural school you've never heard of." The closest thing to a celebrity on this campus (Woodbury has another, in San Diego) is probably visiting assistant professor Barbara Bestor, AIA, a cheerful doyenne of bohemian design who is something of a Los Angeles institution—but decidedly not a "starchitect."

Woodbury, in fact, is fairly new to the architecture game. Though the school recently celebrated its 125th anniversary, it has only had an accredited architecture program since 1994.

Woodbury's physical remoteness is also a pretty good metaphor for the status of its minority student population within the larger architectural profession. According to the AIA's most recent survey of firms, 19 percent of architecture-firm staff are minorities. By contrast, at Woodbury, roughly 70 percent of the 600-odd architecture students are members of a minority group: 37 percent are Hispanic, 14 percent are Armenian, 17 percent are Asian, and 32 percent are listed as "other." Woodbury may be the only architecture school in the United States where "other" means white. On a recent afternoon, a salsa beat emanated from amplifiers on the school's grassy quad, as sorority sisters raised money for charity by selling churros and horchata.

The population at Woodbury is broadly representative of the valley community that the school calls home. But it is also indicative of the direction that American higher education—including architectural education—is taking as a whole. Woodbury, along with several other institutions, including Cal Poly Pomona, the University of Houston, and the University of Nevada, Las Vegas, finds itself at the forefront of a new trend: the rise of the minority architecture student, and in particular of the Hispanic architecture student. In fact, Hispanics now make up 14 percent of all architecture students, according to a 2009 report by the National Architectural Accrediting Board. In coming years, that number is likely to rise significantly, as the percentage of minorities in the general collegiate population expands. Projections indicate that by 2015 the number of high school students of Hispanic descent will have risen by about 50 percent in just 10 years, and Asian students, by 24 percent.

The makeup of Woodbury University's student body has qualified it as a Hispanic-Serving Institution (HSI), a governmental designation that makes it eligible for



Cici Luong, 23
Second-year, Two-year M.Arch.

Luong, who is from Denver, graduated from the University of Colorado Boulder before starting an M.Arch. at Woodbury. After graduate school, she hopes to travel and eventually to earn an MBA, "because I feel that it's another portion of architecture that is very important, other than design."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WYLY THEATRE

Jonathan Garcia, 21
Fourth-year B.Arch.

Garcia was born in Mexico City and immigrated to Los Angeles at the age of five. He says of Woodbury's School of Architecture: "There's not a style or restrictions that we're imposed with." He plans to attend graduate school and then set up an interdisciplinary design studio in Latin America.

federal grants. In 2009, the architecture school received a five-year, $2.8 million grant from the Department of Education to expand its graduate program. With that funding, the school has already built a pair of digital-fabrication laboratories—the second is at the satellite campus in San Diego—and the money will allow it to expand a computer lab, provide stipends and research money for faculty, and devote $100,000 a year to scholarships for high-performing students.

In 2009, the school received another three-year, $600,000 grant from the Department of Housing and Urban Development to support the Arid Lands Institute, a think tank run by designers Hadley and Peter Arnold that is devoted to the development of "designers and leaders who will be resourceful and inventive in addressing water scarcity in the west." Woodbury's designation as an HSI made it eligible for the grant, but it was the school's small size and nimble administration that made the innovative program possible. "We went from an idea to getting chartered in six months," Hadley Arnold says. "You can't do that at a bigger university."

"At Woodbury—and I'm going to try not to make this sound like a cliché—there's an appreciation that students show toward being taught that's not very evident at some of the more established schools, where it's expected. Here it's an adventure, it's exciting. Our students are very hungry. They've struggled really hard to get here," says Ingalill Wahlroos-Ritter, AIA, who has taught at Yale University, Cornell University, and the Southern California Institute of Architecture (SCI-Arc) and is now chair of Woodbury's undergraduate architecture program. "It's tremendously rewarding to be part of the transformation that you see around you every day."

That sense of mission and accomplishment is a common thread among the school's faculty. "We call it the Woodbury Miracle," says Norman Millar, AIA, a gentle bear of a man who became chair of the architecture program in 1999 and is now the school's dean. "We get these students, and ... we open their eyes."

In fact, about 70 percent of Woodbury students are the first in their families to attend college, and many are unprepared for the academic rigors of a collegiate education. "Our students have to do remedial math and writing in their first year," Millar says. Special emphasis is placed on writing, which helps them to "develop their ideas and to make critical arguments." In 2008, Woodbury's B.Arch. program received a citation from Excelencia in Education, a national organization that recognizes institutions for accelerating the achievement of Latino students. The six-year graduation rate for all Woodbury students entering in 2004 was 47 percent; Hispanic B.Arch. students graduated at the same rate, which is a bit short of the national average of 57 percent.

The typical student at an "elite" institution is the child of professionals who has come to architecture through some combination of exposure via parents, school, travel, and native artistic inclination. Woodbury's working-class students often come to the field after watching their family build a home, or through parents who work in the construction industry.

"I decided [to be an architect] between eighth and ninth grade, when my family's home was being built," says Joseph Aguilar, 20, a second-year student from nearby Riverside, Calif., whose mother is a corrections officer. Jesus De Anda, 26, a third-year student also

from Riverside, became interested in an architecture career while watching his father, a construction worker, deliver building materials to job sites. He will be the first member of his family to graduate from a university, but when he does he expects to be over $120,000 in debt, an uncomfortable prospect in the current economy.

Though Woodbury offers a variety of scholarships and work-study opportunities to its students (De Anda is an assistant in the school woodshop), it is a private institution, and tuition is considerably higher than at comparable public universities. A year's undergraduate tuition at Woodbury is currently $29,132; at Cal Poly, in-state tuition comes to $4,807.

To keep tuition costs down, many Woodbury students transfer in to the school after a stint at a local community college. De Anda came after two years at Riverside Community College. Fidelina Ramirez, 25, a fifth-year undergraduate whose interest in architecture stemmed from her high school years, when she helped her father launch a business designing recycling centers, transferred in after two years at Cerritos College, a community college near her home in La Mirada, a Los Angeles County suburb.

Ramirez was also accepted at the more prestigious SCI-Arc, but Woodbury's willingness to accept her work at Cerritos was the difference. "Woodbury gave me credit for basically everything," she says. "I didn't start at the bottom like I would have had to at SCI-Arc."

The Arid Lands Institute is, in its own way, an extension of the university's commitment to the heritage of the school's community. "Very frequently our students are grandchildren of farmers, and they've been raised in a completely urban ecology," says Hadley Arnold, who speaks of her program with great intensity and greater velocity. "I think the students have really engaged with a new idea of citizenship. They're relating to landscape as a valid field ... that is not just produce-a-building."

The students do, in fact, seem to be committed to something more than just the form-driven, capital-A Architecture for which Los Angeles is famous. (Though you will find a good number who are interested in just that.) "The professors were interested in places that I was raised around," says Jeremy Delgado, 27, a recent Woodbury graduate who studied with the Arnolds in the Arid Lands Institute. "This really impressed me because my impression of architecture at the time was that only rich people would hire an architect." Delgado now runs his own small design studio, Friendly Office, with an emphasis on public service projects.

Louis Molina, a participating adjunct who grew up in the valley, may be the only Hispanic architecture faculty member on Woodbury's Burbank campus. You might expect Molina to be somewhat resentful of this, and suspicious of his colleagues as do-gooding interlopers, but that would be to dramatically misinterpret Molina, a sparkplug of a man who seems congenitally optimistic. "It's something we need to improve," he says of the lack of Hispanic faculty, "but ... it offers me an opportunity to be a mentor or role model with the student body."

Strolling the concrete paths that lead across the Woodbury campus, with the California sun shining and a Latin beat hanging in the air, it's hard not to share his enthusiasm. "The youth of today is great," Millar says. "They're agile, they care about stuff, they know how to use machines, they're tolerant." At Woodbury, they are the cresting wave of the future. □

Fidelina Ramirez, 25
Fifth-year B.Arch.

Ramirez has five siblings and immigrated to the United States from Guatemala as a child. She finds Woodbury's faculty of practitioners a major benefit. "They know what's going on in the real world. We get both school and real life from them, because they actually do it."

CONGRATULATIONS

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Finalist, Best Subject-Related Series of Articles, 2007
Finalist, Best How-To Article, 2007
Winner, Best Single Issue, 2006
Finalist, Best Web Site, 2004
Finalist, Best Subject-Related Series of Articles, 2004
Finalist, Best Single Issue, 2004
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Finalist, Best Single Issue, 2009

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residential architect

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Finalist, Best How-To Article, 2009
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DESIGN

PERRY AND MARTY GRANOFF CENTER FOR THE CREATIVE ARTS

PROVIDENCE, R.I.
DILLER SCOFIDIO + RENFRO

TEXT BY CATHY LANG HO
PHOTOS BY IWAN BAAN

ONCE YOU LEARN the mission of the Granoff Center for the Creative Arts at Brown University—an "interdisciplinary arts center [that] will foster innovation, research, collaboration, creativity, and education among the arts, humanities, and sciences"—nothing could seem more logical than the choice of Diller Scofidio + Renfro (DS+R) as architects. Lauded for an interdisciplinary approach that has yielded a range of provocative installation, multimedia, performance, object, landscape, and urban design projects, DS+R operates much the same way the school wants the buildings' users to: unhindered by boundaries.

Sculptor and visual art professor Richard Fishman calls the building's goal "utopian" in its aim to bring faculty and students who might not ordinarily cross paths together to forge new areas of study. To develop the building's program, the heads of seven departments and programs (including Music, Modern Culture and Media, Theater and Performance Studies, Visual Art, and Literary Arts) convened to conceive their dream facility. The school's Creative Arts Council, which Fishman directs, is overseeing the use of these entirely new spaces for entirely new courses, events, and programs. Any faculty member from any department at Brown may propose a project, workshop, or course, which would take up residency in the 38,815-square-foot building for anywhere from an afternoon to a semester. (Among the first classes to be offered are Experimental Musical Instrument Design, wherein students fabricate their own instruments and develop and perform their own compositions, and Sonic Psychogeographies: Site & Sound, a study of sound installations. Both are taught jointly by the visual art and music professors.)

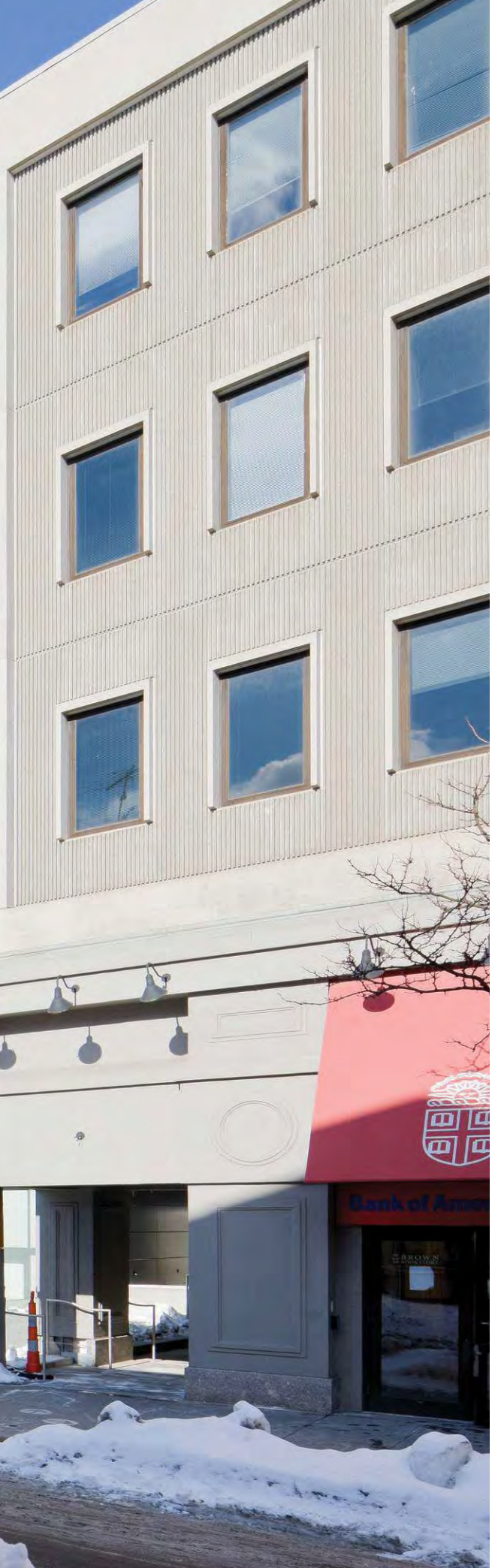
"We understood that the kind of space that best accommodates such a range of activities is the loft," says Charles Renfro, AIA. "The building is open in every way—open plan, open section, open-sourced." Large floor plates, high ceilings, and complete flexibility are the defining characteristics of the building's main studio, meeting, and production spaces, which occupy the front section of the four-story building and are fully visible from the street. The overall organization is quite simple: The front of the building houses the collective spaces, including a gallery and 218-seat auditorium on the ground level as well as the four vast studios above; the rear section holds spaces for more independent activity, such as smaller meeting rooms, some of the offices, and project studios. Acting as a bridge between the glassy open front section and the more closed rear is a freestanding steel staircase, which has exaggerated proportions and extended, cantilevered landings that serve as breakout spaces for informal meetings.

The structure is sensible: The lower three levels are poured-in-place concrete slab while the roof is supported by steel construction. "Concrete was not needed from a structural or acoustic point of view for the upper floors," Renfro explains. "It made sense to use lighter steel for the upper floor, and also turned out to be cheaper this way."

The dramatic move, however, is the vertical "cleave," to use Renfro's term, which slices the building down the middle and offsets the floors by a half-level: The misalignment of the floors and the shear glass wall between them allow the rooms to be visually connected to each other, enhancing an overall feeling of lightness and airiness. Each environment is acoustically isolated, may be completely enclosed by blackout shades, and has scrim shades at all exterior glazing. The façade has another layer of shades—automated exterior venetian blinds that can be tilted to control glare,

Taking their cue from a multilevel site, Diller Scofidio + Renfro designed the new Granoff Center at Brown University to be terraced inside and out. The northern and southern portions of the building are offset by a full half-floor, allowing for sight lines through the glass shear wall separating the two halves of the building. To allow spaces to function as dance rehearsal rooms and as projection venues, the façade features blackout curtains and Mechoshade scrims on the interior and automatic venetian blinds from Nysan on the exterior to help control light levels.

The building is clad in a combination of glazing and CNC-milled zinc composite panels, which start flush against the building where they frame the glazed front façade (opposite), and then transition into three-dimensional pleats as they move back toward the rear. To achieve this effect, the back of the zinc composite material was V-grooved with a CNC router and folded. The pleats appear like gathered fabric as the panels narrow to reveal bands of glazing that expose the back-of-house spaces (this image). An elevator core is placed outside the main floor plate and wraps up the east façade and up onto the roof plane.



natural sunlight, and heat gain. (The shades—along with extensive daylighting, the high R-value of the rainscreen, and the use of recycled materials—will contribute to the Granoff's LEED points; it's set to receive a LEED Gold rating.) "The point was to have various levels of control so that people can manipulate their environments as needed," Renfro says.

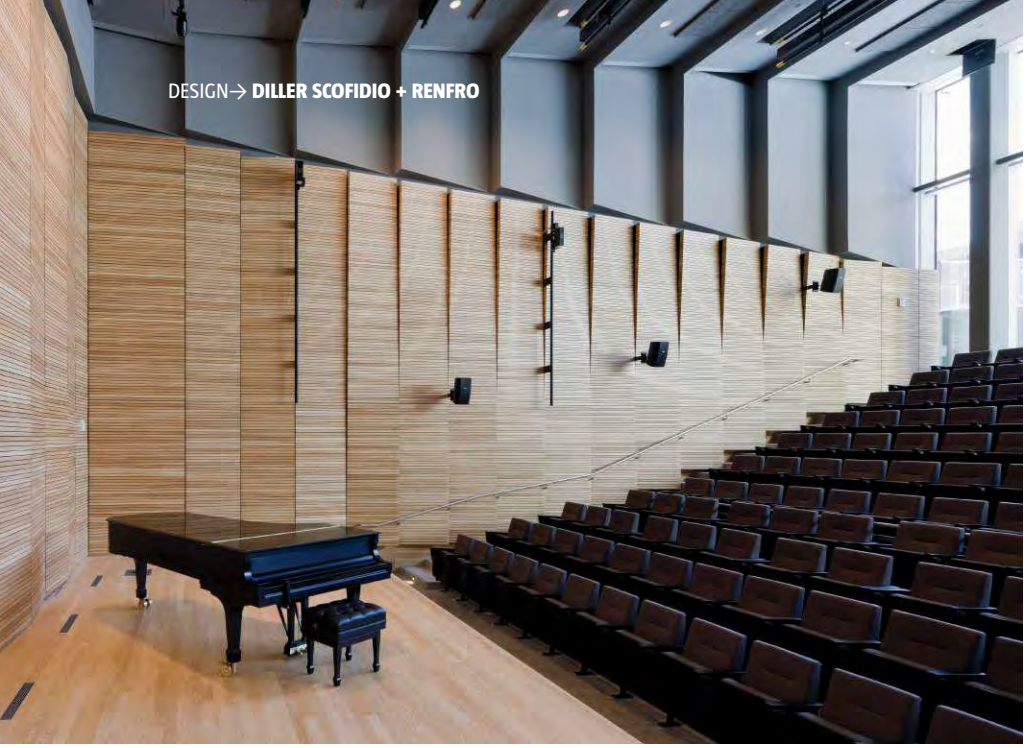
The split-level construction and performance adjacencies germinated from an idea that the firm started to explore with its winning, unbuilt design for the Eyebeam Museum in New York in 2002. "After that project, we started thinking about the performative aspects of the shear [wall] and how these spatial moves could be productive," Renfro says. The firm's renovation of the School of American Ballet in New York in 2006 features a similar construction of a double layer of tempered-laminated glazing with a sound-absorptive airspace. In the Granoff, the gap is 10 inches, contributing to the wall's high sound transmission class rating of 60.

The building's fishbowl nature is part of an effort to connect it to the community. As Fishman puts it, "We wanted a building that would welcome the public and expose the art process." The gallery on the north side of the entrance spills into a greensward that can be used as an extension of the exhibiting space, while the auditorium on the opposite side continues as an outdoor amphitheater that's outfitted with speakers and a pull-down projection screen.

For those unable to guess this is a DS+R project, the designers' proclivity for tilts and slopes should serve as a major clue: There's the rake of the amphitheater, which mimics the angle of the auditorium's seating. And there's the treatment of the zinc rainscreen on the two exterior side walls: The panels, which are CNC-milled zinc composite, start out flat toward the front of the building and are gradually pulled into a three-dimensional pleat, scrunched up in a few corners to reveal some of the private rooms at the building's rear, as if one was lifting the hem of a skirt.

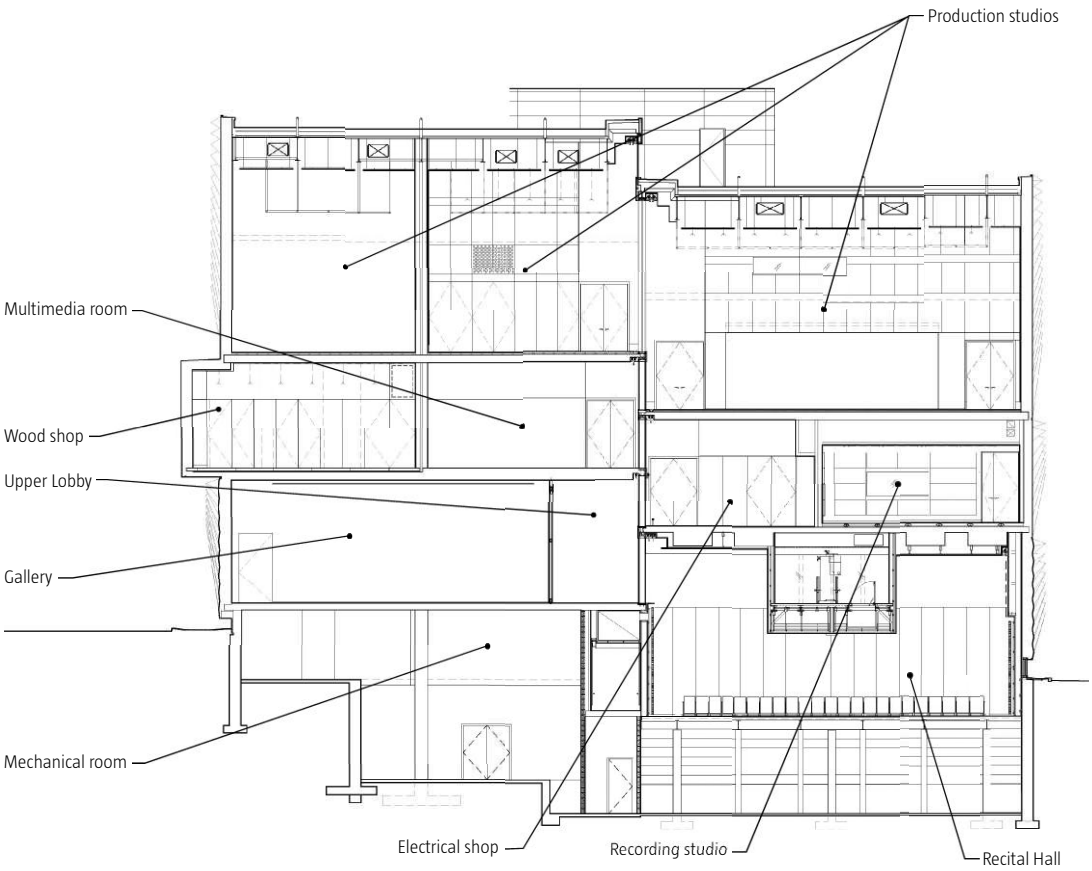
Brown was one of the leaders of the post-1969 curriculum revolution that replaced traditional departments and old-school "silo thinking" in favor of interdisciplinary study, so it's fitting that the university has pioneered a new kind of academic building, to nurture a new kind of teaching and learning.

DESIGN→ **DILLER SCOFIDIO + RENFRO**

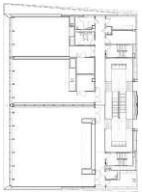


The ground-floor recital hall (opposite top) seats 218 and is acoustically tuned for live performances, but can also be used to screen films and as a lecture space. That flexible use of space continues on the fourth floor, with production spaces that can serve as dance studios, galleries, and projection spaces. The north and south wings are visually connected through the glass shear wall that separates them: Production 1 (this image) looks up into Production 2, and down into the multimedia room on the floor below. The floors are physically connected by a central stair with informal meeting spaces (termed living rooms) at each landing (opposite bottom).

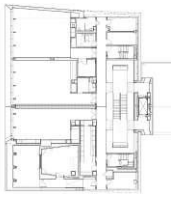
North-South Section



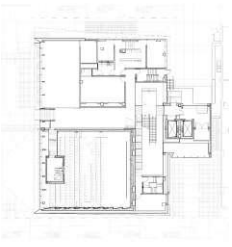
Fourth-Floor Plan



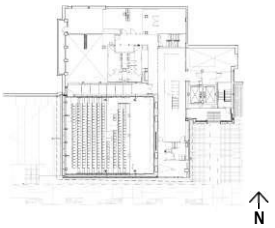
Third-Floor Plan



Second-Floor Plan



First-Floor Plan



Project Credits

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Client/Owner Brown University
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Wayfinding Pentagram; Malcolm Grear Designers
Hardware Consultant Assa Abloy
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Construction Manager Shawmut Design and Construction
Project Manager Peter L'Hommedieu
Size 38,815 gross square feet
Cost $40 million (project cost), $27 million (construction cost)

Materials and Sources

Concrete J.L. Marshall & Sons jlmarshall.com
Concrete Floor Finish Retro Plate by Advanced Floor Products retroplatesystem.com
Concrete Form Finish Olympic Panel Products olypanel.com
Exterior Wall Systems and Interior Acoustical Glass Partition Karas & Karas Glass Co. karasglass.com
Glass Viracon viracon.com
Zinc Composite Material Alcoa (VM zinc) alcoa.com
Exterior Venetian Blinds and Roller Shade Nysan Solar Control nysan.com
Curtainwall Oldcastle BuildingEnvelope oldcastlebe.com
Structural Sealant Dow Corning Corp. dowcorning.com
Air and Vapor Barrier W. R. Grace & Co. grace.com
Roofing Sika Sarnafil usa.sarnafil.sika.com
Green Roof Roofscapes roofmeadow.com
Ornamental Metals Ryan Iron Works www.ryanironworks.net
Seating Series seriesseating.com
Acoustical Wall and Ceiling Panels Pinta-Acoustic pinta-acoustic.com
Ceilings USG Corp. usg.com
Lighting Control Systems Lutron Electronics Co. lutron.com; ETC etcconnect.com
Lighting Litelab Corp. litelab.com
Fabrics and Finishes Maharam maharam.com; **Knoll** knoll.com
Resilient Flooring Action Floor Systems actionfloors.com
Millwork Mark Richey Woodworking and Design markrichey.com
Interior Shades MechoShade Systems mechoshade.com
Tackable Wall Surfacing Walltalkers walltalkers.com
Elevator Kone Corp. kone.com
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AT FIRST MENTION, it seems odd that the Museum of the Moving Image (MMI) is located in Astoria, Queens, N.Y., removed from Manhattan's wealth of cultural institutions. But it turns out that the museum is perfectly sited among the ghosts of early filmmaking. MMI occupies a building in the complex of masonry-and-industrial-sash buildings that once were the Kaufman Astoria Studios. Built in 1920, the buildings served as the East Coast production facilities for Paramount Pictures for more than a decade. As the film industry evolved from silent pictures to "talkies," production moved to Hollywood, and the complex passed through several hands, eventually falling into disrepair.

In 1977, the newly created Astoria Motion Picture and Television Center Foundation assumed responsibility for the site. Four years later, Rochelle Slovin, the foundation's first director, proposed the creation of a museum in one of the Astoria Studios buildings. She crafted a mission, initiated an acquisitions strategy, and inaugurated public programs, and, in 1988, New York's Gwathmey Siegel & Associates Architects completed a renovation of the 1920s building to house the new Museum of the Moving Image.

Over nearly two decades, the museum amassed a collection of 130,000 artifacts representing every aspect of film and television production, and by 1996 it had outgrown its facilities. Needing more space, Slovin spearheaded a master plan for renovation, upgrades, and, most importantly, an expansion, which would almost double the museum's size from 50,000 to 97,700 square feet. Then she went in search of an architect.

"We wanted a New York architect, but we also wanted one who was not only talented, but under-recognized at the time," Slovin says, explaining that she has long been committed to young artists and designers. The selection process began with 31 firms being sent Requests For Qualifications. Eventually, Slovin and a museum committee reduced the list and compensated three firms to develop ideas for the expansion. "Thomas Leeser immediately stood out," Slovin says. "He had a unique, imaginative perspective about the media arts and was undeterred by a budget that kept shrinking."

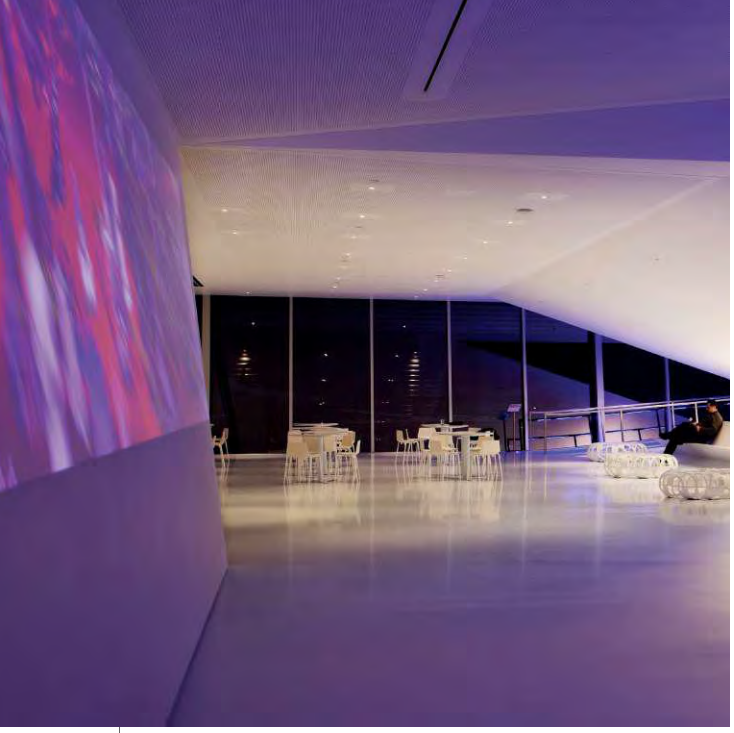
Thus began the museum's three-year, $67 million evolution ($54.7 provided by the City of New York). The site had been listed on the National Register of Historic Places in 1976, a designation that limited alterations to the exterior. The only apparent change to the historic façade is a new entrance and bolder signage on mirrored and transparent glass. However, once visitors enter the lobby, the moving-image experience begins immediately. A 50-foot-long wall ignites a voyage of gentle disorientation, with a large-scale panoramic video constantly projecting a swirling, cyclical narrative.

To entice visitors from the sleek white lobby and into the museum's new main 267-seat theater, architect Thomas Leeser created a blue-light-lined ramp entry sequence that hints at the deep blue tones of the space beyond. The rest of the lobby is filled with reception and café areas.

MUSEUM OF THE MOVING IMAGE

NEW YORK
LEESER ARCHITECTURE

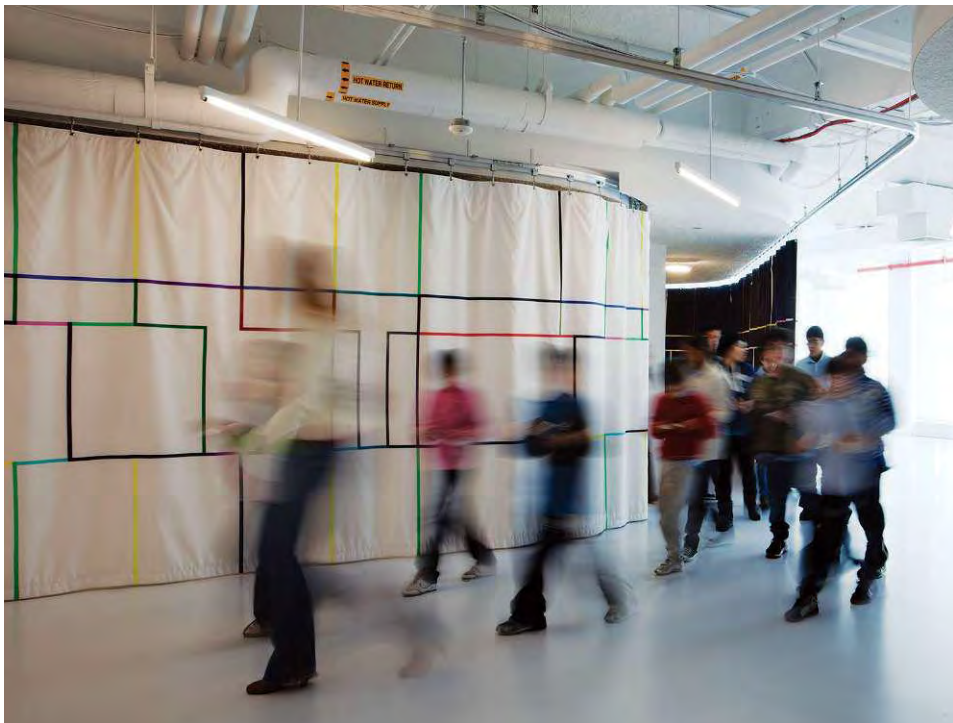
TEXT BY SARA HART
PHOTOS BY ELIZABETH FELICELLA



Across the lobby, a pair of gently sloping ramps edged in soft blue light lead to the new 267-seat main theater. The theater's interior is wrapped in an acoustical womb of 1,136 triangular, vacuum-formed felt panels fitted together by open joints with integrated lighting. The pulsing color of the panels is International Klein Blue, named after the French artist Yves Klein, who developed the intense, ultramarine-based color from pure pigment and a binding medium.

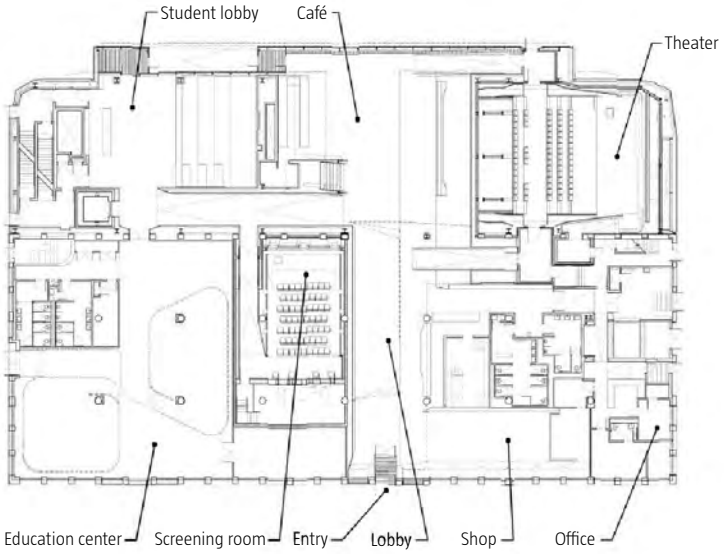
Elsewhere, Leeser employed light-blue, seamless, cast-polyester floors and canted walls, meant, according to Leeser, to evoke the otherworldly experience of being inside a spaceship. A grand staircase is the orienting element for the museum. The first landing delivers visitors into a darkened amphitheater, where visual acclimation is challenged by digital projections. Mood lighting seeps out from under the amphitheater benches, further manipulating depth perception. Spatial flexibility drives much of the interior architecture. Circulation and exhibitions often share the space, creating a continuous experience. Fortunately, Leeser's strategy has a logical flow of circulation and gallery spaces that is easily embraced, minimizing any discomfort from constant changes in lighting levels. This is true even on the third floor, where a 4,100-square-foot gallery offers flexible space for experimental installations incorporating real-time, interactive 3D and stereographic projections. These virtual spaces are created within the rational boundaries of the physical gallery, creating what the exhibiting artists are calling "hybrid spaces."

Leeser's addition covers the back of the existing building, providing a backdrop for a yet-to-be-completed 10,000-square-foot plaza. Students will enter the new education center from the plaza. The façade's skin is made of triangular panels similar to those in the ground-floor theater. More than a thousand thin, light-blue aluminum panels with open joints are precisely fitted together with a tolerance of a mere 3/16 inch. The effect, in contrast to the heaviness of the existing masonry building, is that of super-lightweight apparition, dematerializing against the sky. It's a beautifully quiet counterpoint to the nonstop action inside.

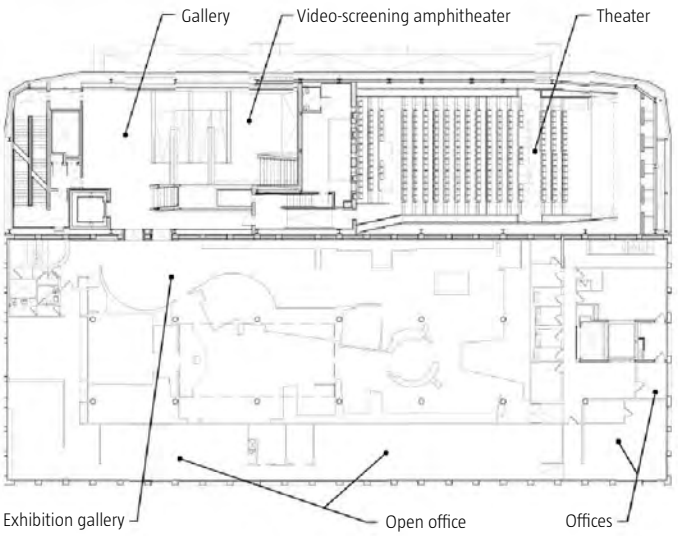


In a museum about moving images, projection space is at a premium. So the lobby (with its cast-polyester floors and white walls) doubles as a gallery with a 95-foot-long projection wall (this image) across from the theater entry that can also be viewed from the café area (opposite). To control light levels and define classroom areas in the education center—with its separate student entry (below left)—the architects installed a sinuous ceiling-mounted track, along which runs a curtain designed by textile-artist Cindy Sirko (below right). People in the public areas can use a central staircase (shown in this image) for direct access to the exhibitions in the galleries upstairs.

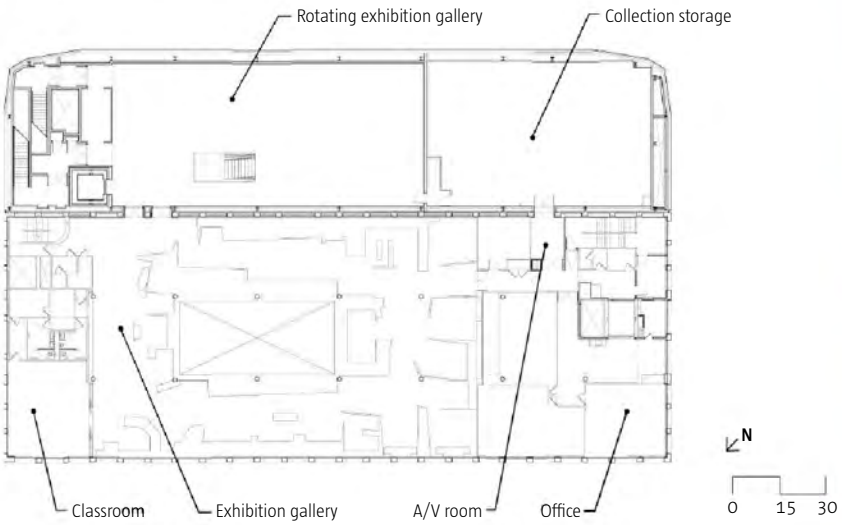
Ground-Floor Plan

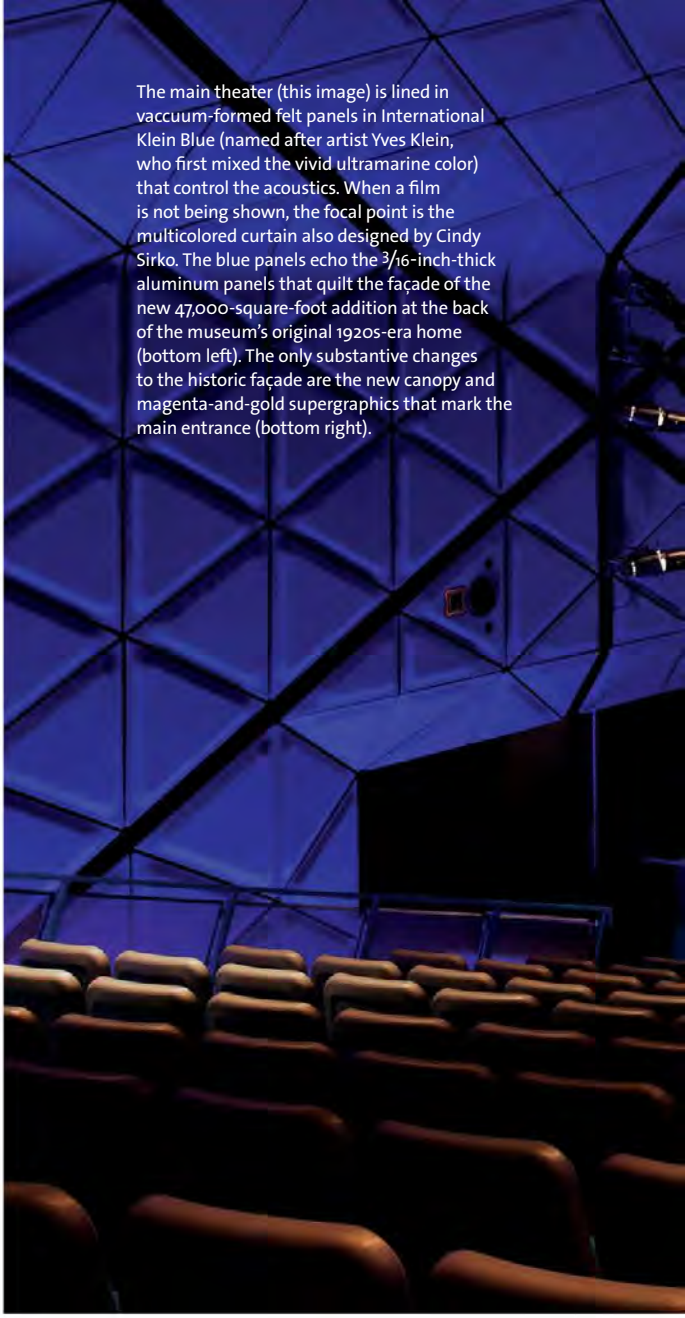


Second-Floor Plan

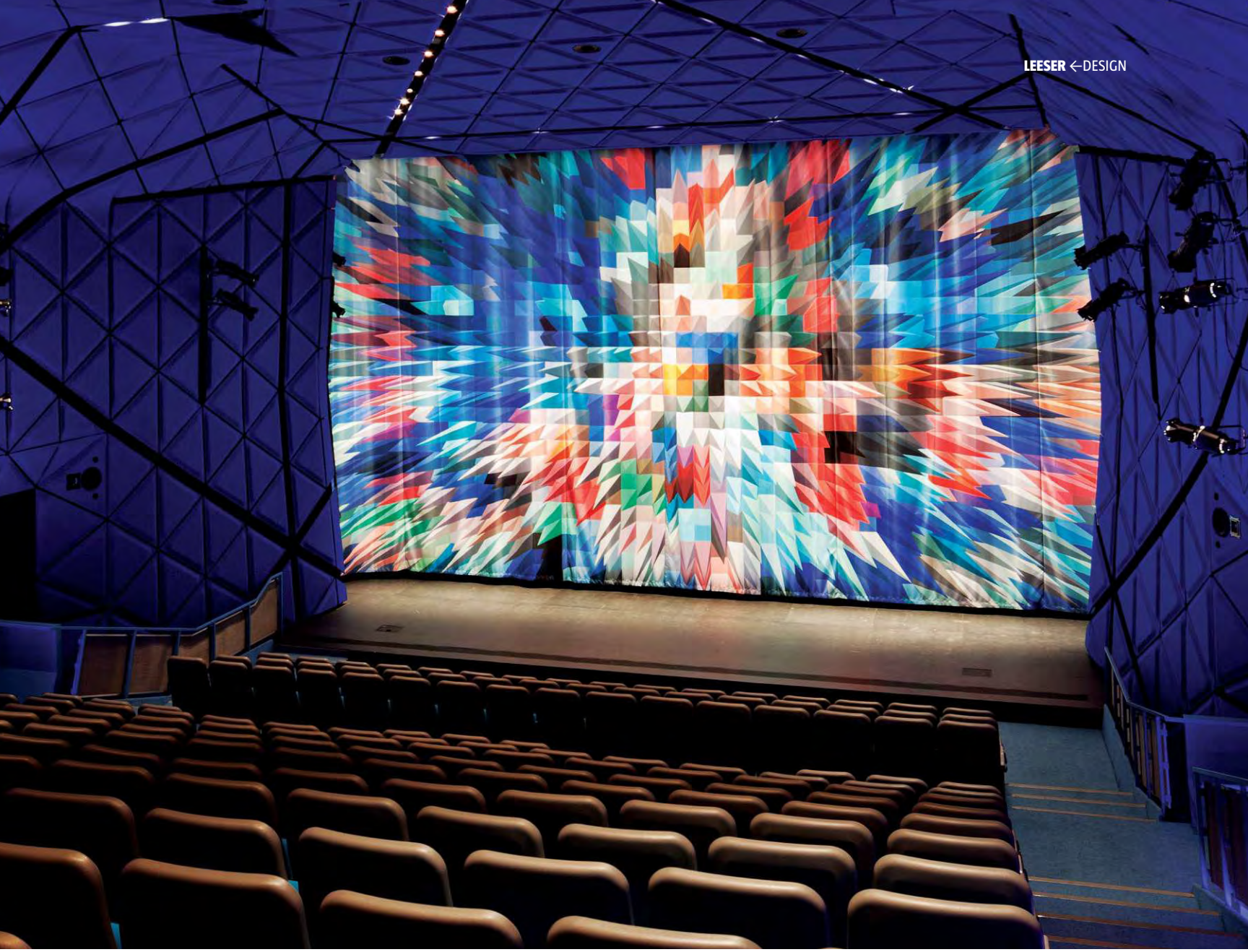


Third-Floor Plan



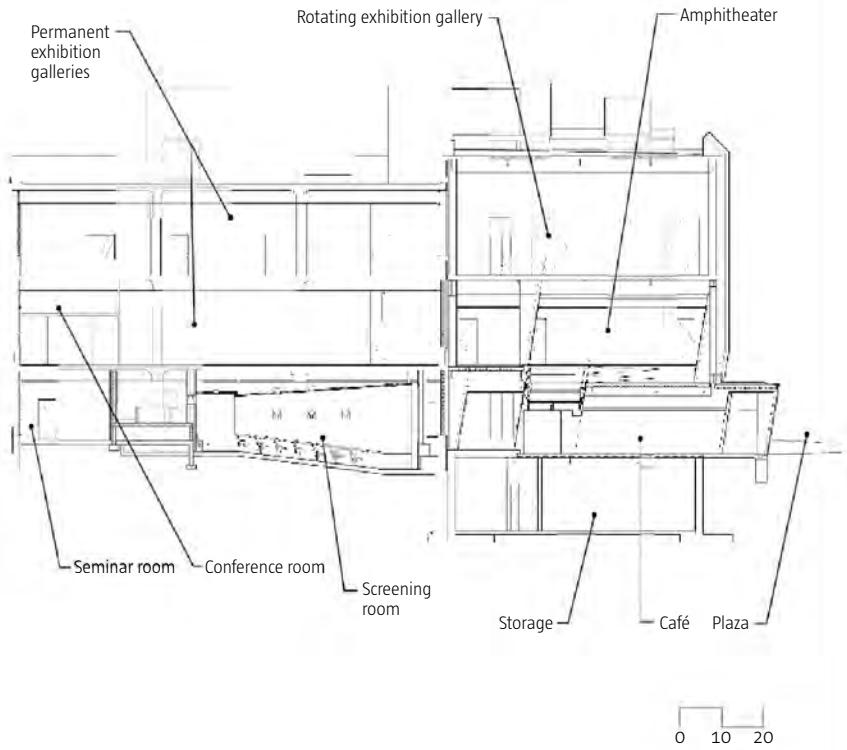


The main theater (this image) is lined in vaccuum-formed felt panels in International Klein Blue (named after artist Yves Klein, who first mixed the vivid ultramarine color) that control the acoustics. When a film is not being shown, the focal point is the multicolored curtain also designed by Cindy Sirko. The blue panels echo the 3/16-inch-thick aluminum panels that quilt the façade of the new 47,000-square-foot addition at the back of the museum's original 1920s-era home (bottom left). The only substantive changes to the historic façade are the new canopy and magenta-and-gold supergraphics that mark the main entrance (bottom right).

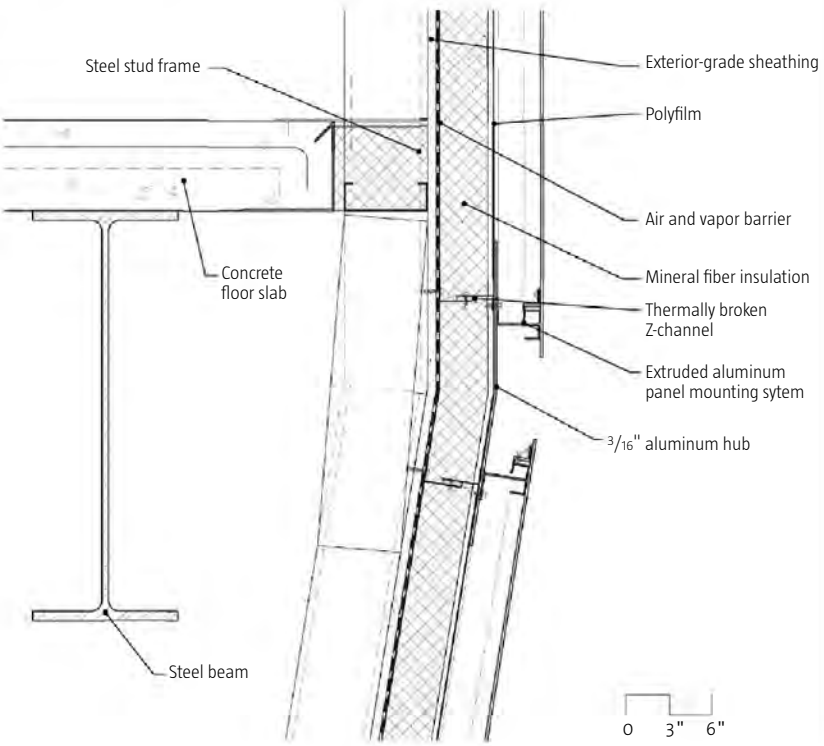



MUSEUM OF MOVING IMAGE

Section



Cutrainwall Section



Project Credits

Project Museum of the Moving Image, Astoria, N.Y.
Client Museum of the Moving Image—Rochelle Slovin (director); Herbert S. Schlosser (chairman of the board of trustees)
Architect Leeser Architecture, New York—Thomas Leeser (founder and principal); David Linehan, AIA, (project manager); Simon Arnold, Kate Burke, Sofia Castricone, Henry Grosman, Joseph Haberl (design team)
Owner's Representative Levien & Co.
Construction Manager F.J. Sciame Construction Co.
Audio/Visual Scharff Weisberg
Acoustician JaffeHolden
Lighting L'Observatoire International
Graphics Karlssonwilker
Exterior Wall R.A. Heintges & Associates
M/E/P Engineers Ambrosino, DePinto & Schmieder
Specification Construction Specifications
Structural Engineers Anastos Engineering Associates
Civil/Geo-Technical Stantec
Code/Expediting JAM Consultants
Elevator VDA
Hazardous Materials TRC Cos.
Projection Systems MDC Systems
Restaurant Program JGL
Design Security Ducibella Venter & Santore
Sustainable Design Atelier Ten
Telephone & Data Shen Milsom Wilke
Textile Design Cindy Sirko
Courtyard David Dew Bruner Design
A/V Contractor Electrosonic
Security Contractor Tritech Communications
Rendering VUW
Size 50,000 gross square feet (existing), 47,700 gross square feet (new construction)
Cost $67 million

Materials and Sources

Wallcoverings **Designtex (felt)** designtex.com
Drywall **Knauf Drywall (perforated drywall)** www.knaufdrywall.co.uk
Flooring **Fusion Floors (poured urethane)** fusionfloors.com
Carpet/Carpet Tile **Bentley Prince Street** bentleyprincestreet.com
Glass **Competition Architectural Metals**
Lounge Seating **Moroso (Osorom seating)** moroso.it
Cafeteria, Dining, Auditorium Seating **Viccarbe (Aspa tables)** viccarbe.com; **Materia (Mayflower Stools)** materia.se; **Irwin Seating Co. (theater seating)** irwinseating.com; **Maharam (upholstery)** maharam.com
Student Orientation Cushions **Quinze & Milan** quinzeandmilan.tv
Conference Table **Asplund (Bermuda Mega table)** asplund.org
Chairs **Dynamobel (Dis chairs)** dynamobel.com
Custom Curtain **Rose Brand (designed by Cindy Sirko)** rosebrand.com
Desks **Howe (Tutor)** howe.com
Chairs **Vitra (Sim, designed by Jasper Morrison)** www.vitra.com
Architectural Woodworking **MillerBlaker** millerblaker.com
Signage **Graphic Systems Group** gsgnyc.com

New technologies are revolutionizing the process and product of architecture. To celebrate advances in building technology, ARCHITECT magazine announces the fifth annual R+D Awards. The awards honor innovative materials and systems at every scale—from HVAC and structural systems to curtainwall and ceiling-panel assemblies to discrete building materials such as wood composites and textiles.

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Friday, May 6, 2011
late submission deadline (postmark; additional fee is required)

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Additional entries: $95 each

Late entries: $50 additional fee per entry by May 6, 2011

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- **Production**—Products, materials, and systems that are currently available for use
- **Application**—Products, materials, and systems as used in a single architectural project or group of related architectural projects

The jury will consider new materials, products, and systems as well as unconventional uses of existing materials, products, and systems. Entries will be judged for their potential or documented innovation in fabrication, assembly, installation, and performance. All entries will be judged according to their potential to advance the aesthetic, environmental, social, and technological value of architecture.

ARCHITECT

The new civil engineering building at the University of Minnesota Duluth—designed by Chicago-based Ross Barney Architects—uses locally sourced materials such as concrete and Cor-Ten steel. The protruding water scuppers are clad in wood reclaimed from old pickle barrels.

JAMES I. SWENSON CIVIL ENGINEERING BUILDING

DULUTH, MINN.

ROSS BARNEY ARCHITECTS

TEXT BY VERNON MAYS
PHOTOS BY KATE JOYCE STUDIOS

ACADEMIC BUILDINGS ARE familiar ground for Carol Ross Barney, FAIA. But when the University of Minnesota Duluth (UMD) commissioned her to design a classroom and lab facility for its new Department of Civil Engineering, she recognized a chance to do something different. Rather than simply design a building to house educational activities, she'd go one better: Make a building that teaches on its own.

"This building is an architect's dream, because it is about materials," says Ross Barney, principal of Chicago-based Ross Barney Architects. Built just a short distance from the rugged Iron Range—a region in northeast Minnesota that spawned a vibrant iron ore mining industry—the James I. Swenson Civil Engineering Building not only celebrates the raw beauty of locally available materials such as Cor-Ten steel, reclaimed taconite rocks, repurposed wood, and concrete, but does so in a way that creates teachable moments for the department's 190 undergraduate students.

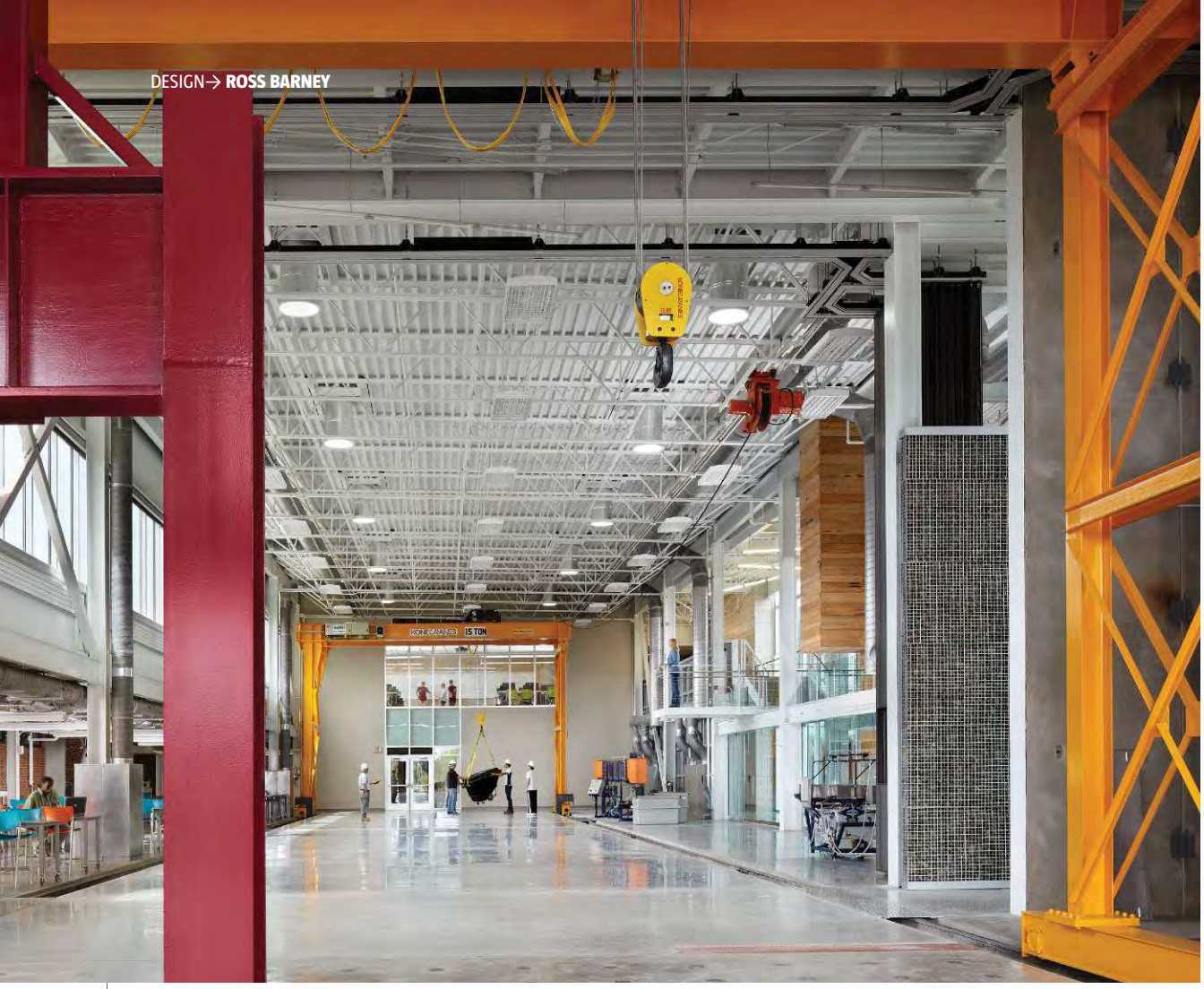
At every turn, the building functions doubly as a pedagogical tool, revealing the structural systems, connection details, and stormwater management techniques that are core to the civil engineering curriculum. Among them: oversized scuppers (made from reclaimed pickle barrels) that channel stormwater from the roof to a trio of Cor-Ten steel drums, two 15-ton gantry cranes located in the main testing laboratories, and a precast concrete wall with tilt-up braces and kickers left in place to demonstrate the construction process.

The two-story, 35,300-square-foot building houses classrooms, instructional and research laboratories, and office space for the new department (which admitted its first students in 2008). The floor plan is organized around two high-bay testing laboratories: one for structural tests, another for hydrology. Intensive use of the building called for a robust infrastructure, including a strong wall and floor system. It also incorporates three 36-foot-by-24-foot operable doors that allow the cranes to be moved through the building.

Ross Barney sited the building intentionally to reinforce established pedestrian circulation patterns on the UMD campus, which are planned so that students can find relief inside during the region's brutal winters. A main campus walkway slices through the civil engineering building along a sheer glass wall that allows views into the structural lab. This connection to campus circulation is key to the building's role as a promotional tool for the department. "The visibility of the building and the ability of students to look into the lab are tremendous," says department head Andrea Schokker. "It is a great student recruitment tool."

The central hydraulics laboratory serves as a main node of activity to which other spaces relate visually and functionally. Students walking along the adjacent main stair, for example, can watch the tests happening inside or linger on the observation deck. Faculty offices and graduate student workspaces are

The building is intended to be used both as a learning tool for the students and as a recruitment tool for the program. As such, structural bracing is left exposed and large bifold doors expose the high-bay spaces, both for moving objects in and out and for showing off experiments to prospective students (this image). Rain scuppers (below left) channel stormwater into cisterns and a French drain system in the surrounding landscape (below middle), and fully glazed sections between the more solid concrete and Cor-Ten steel allow passersby to see the activity within (below right).

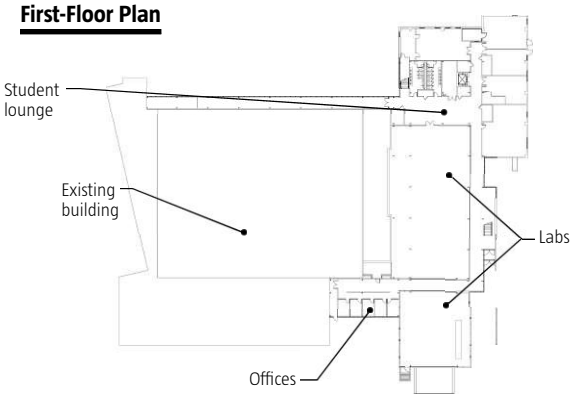


interspersed throughout the building to encourage interaction among the various groups. Schokker also had suggested the addition of a student lounge to the original program. Her rationale: This new group of students needed a place to congregate. The lounge, in fact, has become a much-used meeting area where students collaborate on team projects.

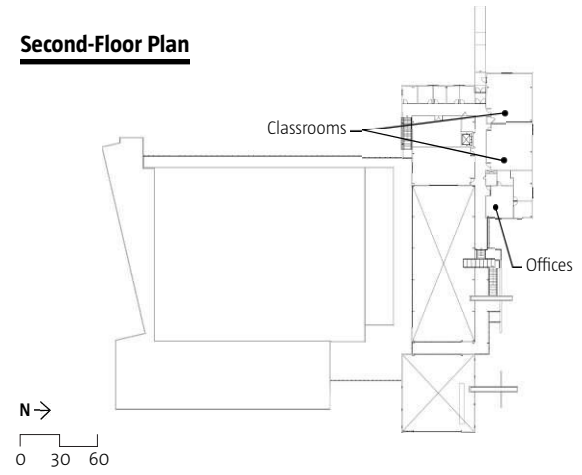
Inside, as out, the details of construction are left open to view as teaching aids. Weld plates are visible. Ductwork is exposed. And spaces are divided by gabion walls filled with raw taconite rock. "It's like being in a giant educational tool," Schokker says. "It gives us great examples to show the students firsthand."

UMD's civil engineering program stresses environmentally responsible design, and the building scores high in that regard, achieving LEED Gold certification. An elaborate stormwater collection system—which collects water that feeds the flume used for student experiments within the building—sets the tone, but other means such as low-emitting materials, advanced thermal-comfort control, access to daylight and views, and an underfloor air distribution system provide a healthy environment and additional talking points for the curriculum. All told, this building-as-teaching-tool reaps the benefits of a direct approach to architecture in delivering hands-on lessons in materials and methods.

First-Floor Plan

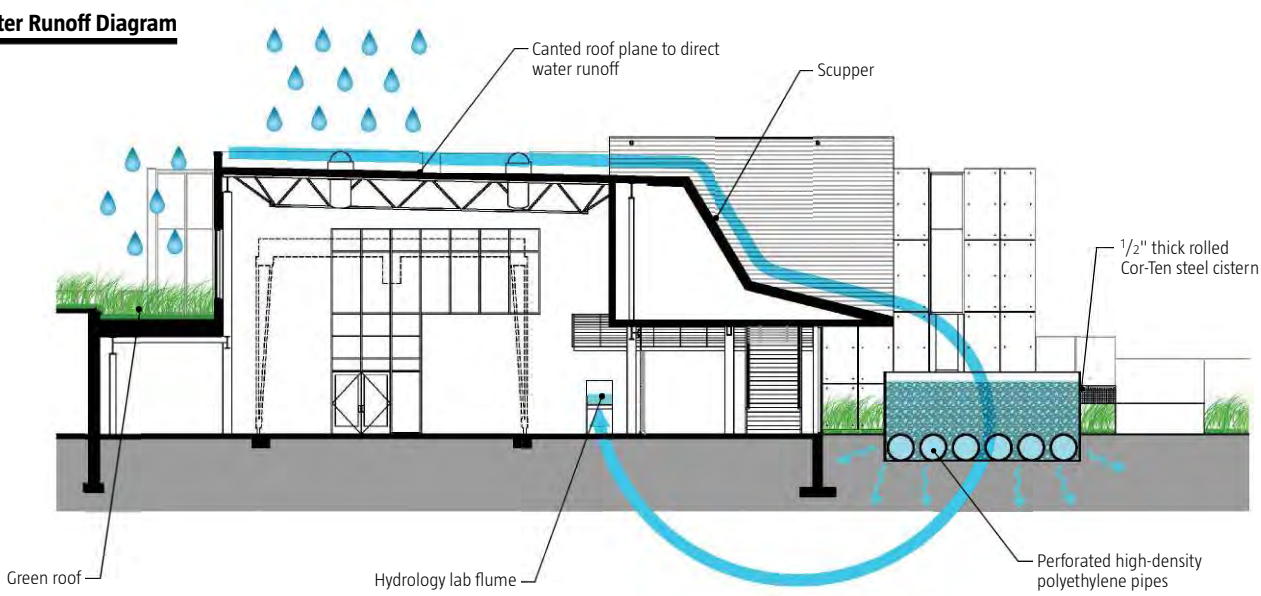


Second-Floor Plan



A gantry crane is able to move through much of the building to allow objects to be moved from high bay to high bay for experiments and installations (above left). Intended to be used as a pedagogical tool inside as well as out, most building systems are left exposed, including the structure, the wood-clad rain scuppers that penetrate the building envelope, and gabion walls filled with local taconite stone (this image).

Stormwater Runoff Diagram



TOOL BOX: STORMWATER MANAGEMENT

The site for the Swenson Civil Engineering Building straddles two watersheds, one of which flows into an environmentally protected trout stream. Ross Barney Architects took extensive measures to reduce the amount of stormwater runoff (which could overwhelm the streams) and improve the quality of the water through natural groundwater recharge. Ultimately, 90 percent of the site's average precipitation is captured and treated on site.

The primary strategy is to direct water from the rooftop through large scuppers and into an underground drain. A pump at the base of the drain siphons the graywater back into the building, where it is used to fill the 7,500-gallon flume in the hydraulics laboratory for student experiments. When the flume system is at capacity, the water gradually filters back into the site's hydrological system.

An intensive green roof with a mixture of sedum and native prairie grasses planted in 6 inches of soil covers more than 30 percent of the roof area. The remaining surface is a built-up roof that drains through the three large reclaimed wood–clad scuppers, which divert rainwater into a trio of above-ground cylinders fashioned out of 1/2 inch-thick rolled Cor-Ten steel. Each of the drums is 24 feet in diameter, and filled nearly to capacity with taconite rock.

Beneath the drums is a 30-foot-by-130-foot field of 30-inch-diameter perforated high-density polyethylene pipes that act as a French drain. Water from the roof and the surrounding site filters through layers of taconite and soil, passing into the perforated pipes. The water is naturally filtered and pumped back into the hydrology lab's flume.

A secondary source of stormwater management involves a series of smaller scuppers along the east and west faces of the building. These scuppers divert water from the roof into adjacent rain gardens—comprising non-irrigated native plantings—and across permeable pavers.

Project Credits

Project James I. Swenson Civil Engineering Building, Duluth, Minn.
Client University of Minnesota Duluth—Kathryn Martin (chancellor emerita); Gregory Fox (vice chancellor, finance and operations); John King (director, facilities management); John Rashid (associate director, facilities management); James P. Riehl (dean, Swenson College of Science and Engineering, professor of chemistry); Andrea Schokker (professor and head of civil engineering)
Major Donor James I. and Susan Swenson
Architect Ross Barney Architects, Chicago—Carol Ross Barney, FAIA (design principal); Michael Ross, AIA (principal-in-charge); Monica Chadha (project manager); Jonathan Graves (project architect); Kimberley Patten, AIA (sustainable design and interiors); Marc Anderson; Ricardo Nabholz
Associate Architect SJA Architects, Duluth, Minn.—Ronald Stanius, AIA (specifications and contracts); Rickard Stanius, AIA (construction administration); Brian Morse, AIA (project manager and project architect); Corey Beste, Ryan Weis
Mechanical, Electrical & Plumbing Engineer Dunham Associates
Structural Engineer Meyer Borgman Johnson
Civil Engineer MSA Professional Services
General Contractor Stahl Construction Co.—Deborah Aldrich (project manager)
Landscape Architect Oslund.and.Assoc.—Thomas Oslund
Consultants Hallberg Engineering
Size 35,300 square feet
Cost $12.1 million

Materials and Sources

Building Management Systems and Services Siemens Corp. usa.siemens.com
Carpet Shaw Contract Corp. (Prisma Tiles) shawcontractgroup.com
Ceilings USG Corp. (Millenia ClimaPlus) usg.com
Precast Concrete Hanson Structural Precast Midwest hansonstructuralprecast.com
Exterior Wall Systems Anderson IronWorks (Cor-Ten steel rainscreen panels) andersonironworks.com
Flooring Haworth (TecCrete access floor) haworth.com
Furniture Haworth haworth.com
Glass PPG Industries (Solarban 60) ppg.com
Gypsum Georgia-Pacific (ToughRock) gp.com
HVAC McQuay International (air-handling units) mcquay.com
Displacement Ventilation Diffusers Halton halton.com
Insulation Certainteed Corp. certainteed.com
Precast Concrete Insulation System Thermomass thermomass.com
Lighting Control Systems Lutron Electronics Co. (EcoSystem) lutron.com
Lighting Bega (exterior bridge lights and entry bollards) bega-us.com; **Metalux by Cooper Lighting (high-bay spaces)** www.metalux-lighting.com; **Focal Point (Avenue A in corridors)** focalpointlights.com; **Corelite by Cooper Lighting (Stellar, in classrooms and offices)** www.corelite.com; **Delray Lighting (entry stair)** delraylighting.com
Metal Anderson Iron Works (Cor-Ten Steel) andersonironworks.com
Millwork Environ Biocomposites Manufacturing (Dakota Burl) environbiocomposites.com; **St. Germain's Cabinet (fabrication)** stgermaincabinets.com
Paints and Finishes Sherwin-Williams sherwin-williams.com
Plumbing and Water System Zurn (plumbing fixtures, dual-flush flushometer, EcoVantage urinals, Aquasense sensor faucets) zurn.com
Roofing Henry Co. (modified bitumen system with white roof coating and vegetated covering) henry.com
Seating Haworth haworth.com; **Kielhauer (lab stools)** keilhauer.com
Structural System Duluth Steel Fabricators (structural steel)
Walls Premier Block Corp. (Ultra Burnished Masonry Units) premierblock.com
Windows, Curtainwalls, and Doors Kawneer (1600) kawneer.com; **Wilson Doors (bifold exterior door)** wilsondoors.com; **Hufcor (interior operable partitions, oversized natural-steel-and-glass partitions)** hufcor.com

Resource/Classifieds

Resource

Resource

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Circle no. 316

Circle no. 317

Circle no. 318

Circle no. 319

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TEXT BY THOMAS FISHER, ASSOC. AIA

→1985 P/A AWARD

HERE TODAY, GONE TOMORROW

THE FLEETING EXISTENCE OF **FRANK GEHRY'S ICS/ERF AT THE UNIVERSITY OF CALIFORNIA AT IRVINE** SHOWS HOW THE PERMANENCE OF A P/A AWARD CANNOT ALTER THE IMPERMANCE OF SOME AWARD-WINNING BUILDINGS.

1985 P/A Awards Jury
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Reginald W. Griffith
Eric Owen Moss, FAIA
William Pedersen, FAIA
Elizabeth Plater-Zyberk, FAIA
Peter Walker, AIA
Susan Weidemann
Steven Winter, FAIA

THE INFORMATION AND COMPUTER Science/Engineering Research Facility (ICS/ERF) at the University of California at Irvine—an early and energetic P/A Award–winning work by Frank Gehry—was completed in 1986 as designed, and has already been demolished. Its destruction in 2007 represents a loss not only to the architectural profession, but also to the UC Irvine community whose sprawling, suburban campus suffers from a surfeit of big, banal buildings.

Replaced by a larger structure, ICS/ERF was just 18,000 square feet and built on a modest budget ($105 per square foot). Its inexpensive stucco finish, painted metal cladding, and blacktop paving suggest that the university may not have meant it to last. But that still doesn't excuse the lack of maintenance it received: Leaking roofs, rotting wood, and failing ventilation systems were cited as reasons for the building's removal.

ICS/ERF, however, did not die in vain. Its demolition has bolstered efforts to preserve other Gehry buildings. And its loss may make us all a little less complacent in thinking that an architectural award will dissuade the owner of an honored building from disposing of it. If anything, ICS/ERF seemed to express that fact, with its informal materials and apparently casual composition giving it a temporary feel. However much we might preserve the idea and image of a building by giving it an award and a permanent place in the architectural canon, ICS/ERF reminds us of the provisional nature of postmodern life and the challenge of creating timeless architecture in a transient age. □

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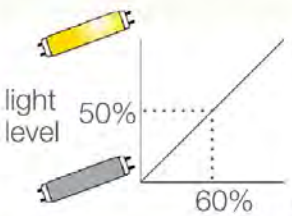

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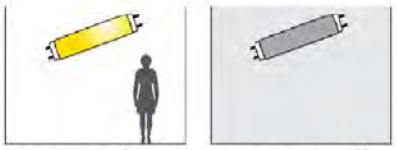

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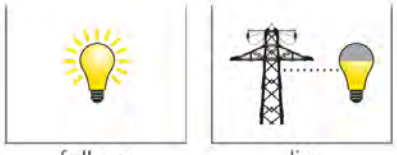

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