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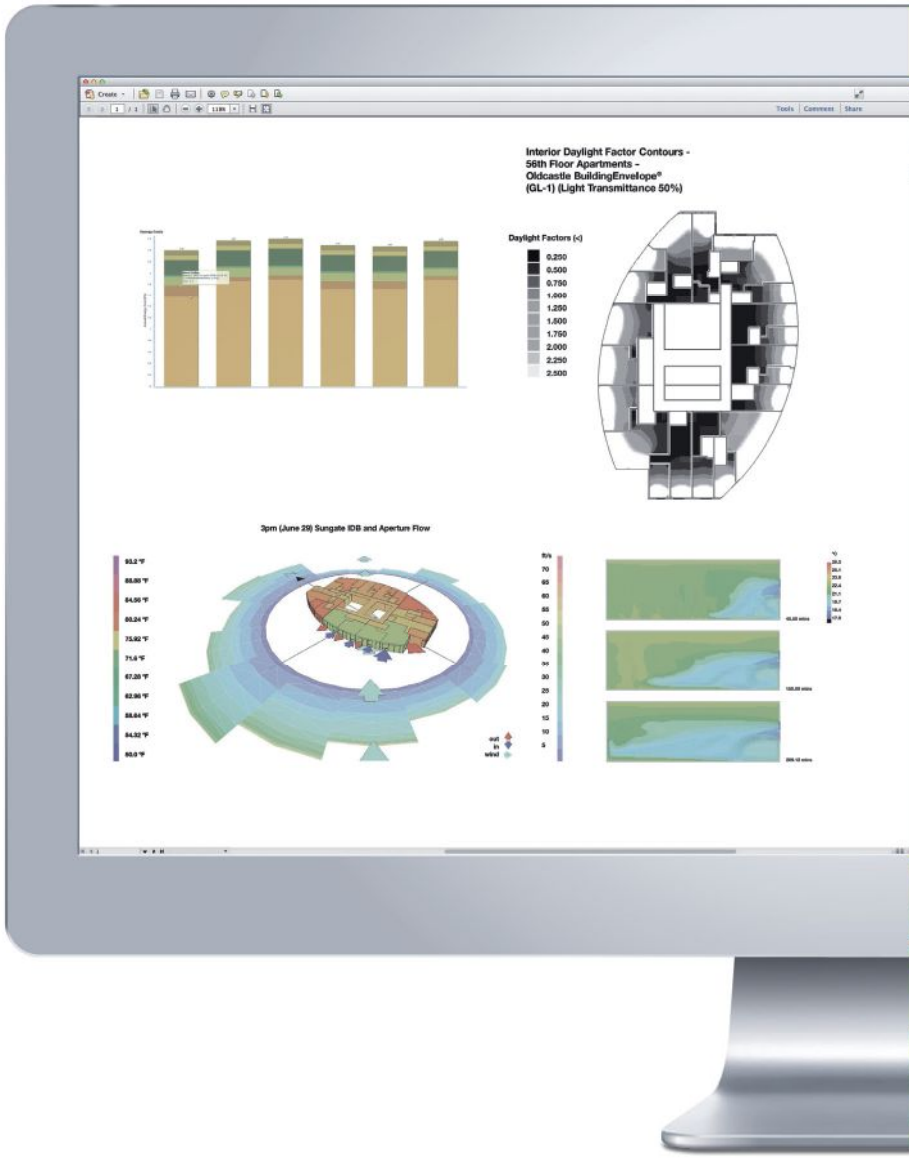

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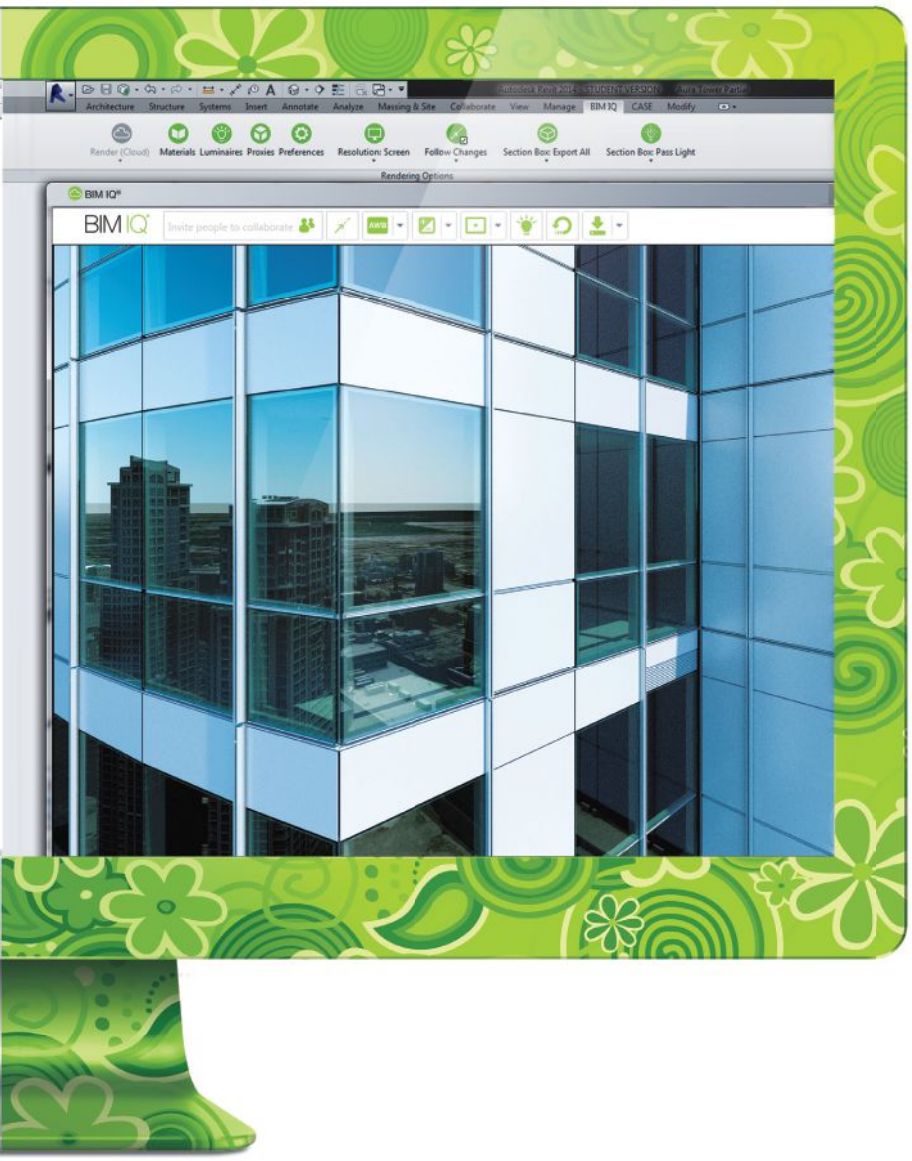

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Top: Jesuit High School Chapel
Bottom: Tula House

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ON THE COVER

The Faculty of Architecture, Building and Planning at the University of Melbourne's Melbourne School of Design in Australia, designed by the team of NADAAA and John Wardle Architects. Photo by Peter Bennetts.

TOP: JOE FLETCHER; BOTTOM: JAMES DOW/PATKAU ARCHITECTS

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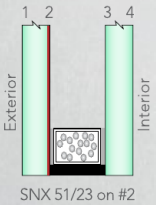

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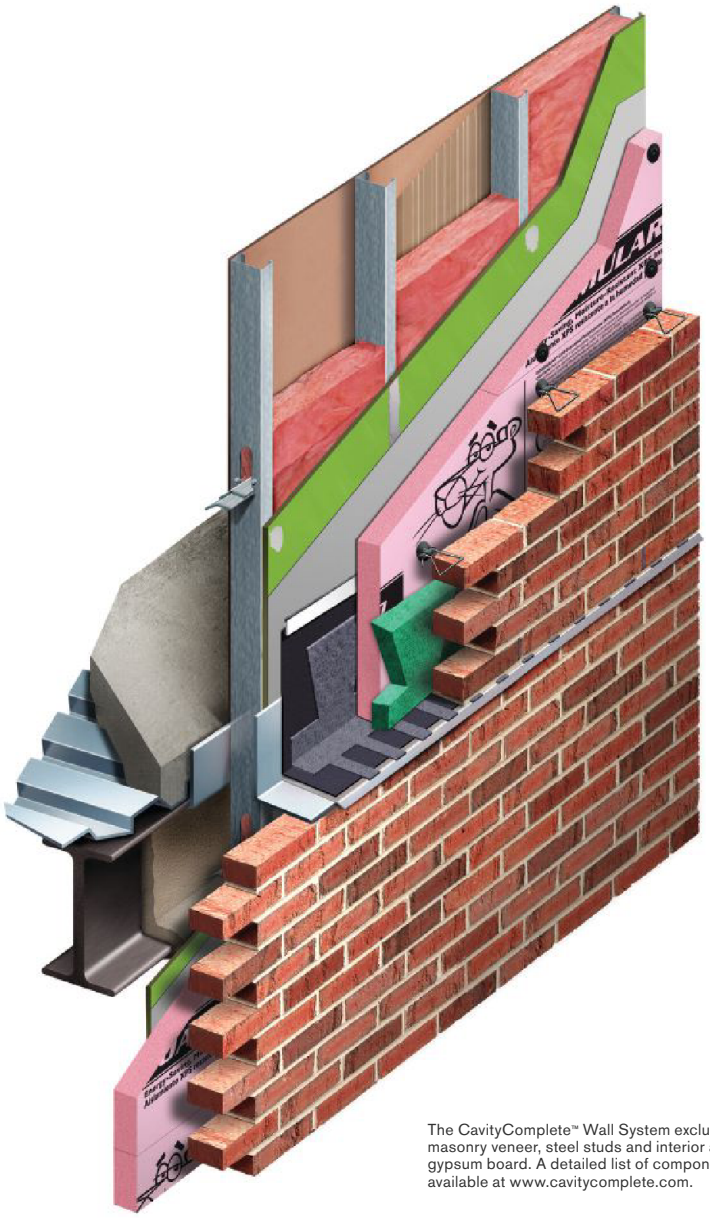

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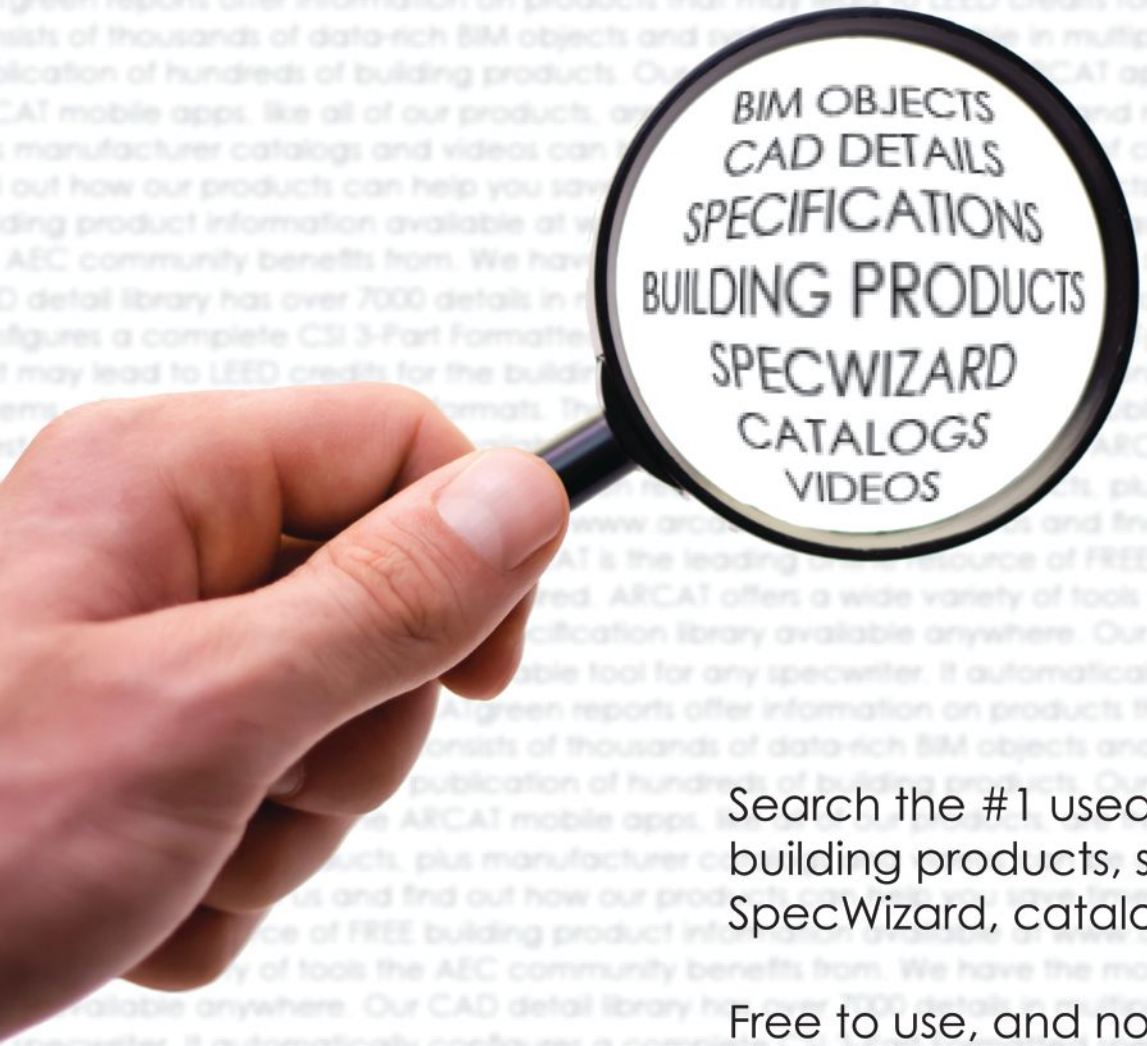

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DESPITE THE SETBACK, THE U.S. DEPARTMENT OF TRANSPORTATION IS PROCEEDING WITH PROJECTS IN FIVE REGIONS, WHICH TOGETHER ARE HOME TO 65 PERCENT OF THE COUNTRY'S POPULATION.

THE LITTLE ENGINE THAT MIGHT

YEARS AFTER THREE STATES REJECTED BILLIONS IN FEDERAL FUNDS FOR HIGH-SPEED RAIL, CONSTRUCTION IS QUIETLY PROCEEDING ELSEWHERE.

IN SEPTEMBER, a group called the Northeast Maglev applied for a railway franchise in Maryland, as a step in developing a new passenger train between Washington, D.C., and Baltimore. The roughly 40-mile ride would take 15 minutes, less than half the time of Amtrak's fastest option, the Acela Express, and a quarter the time of the MARC regional commuter train. That's an exciting prospect for rail fans and frequent riders like me, given that the political prospects for high-speed trains have appeared to be nil since 2011, when the governors of three states turned down billions of dollars in stimulus funding for passenger rail.

Despite that setback, the U.S. Department of Transportation (DOT) is proceeding with projects in five regions, which together are home to 65 percent of the country's population: the Pacific Northwest, from Eugene, Ore., to Vancouver, British Columbia; California, from San Francisco and Sacramento to San Diego; the South, from the Dallas–Fort Worth Metroplex to Oklahoma City; the Eastern seaboard, from Charlotte, N.C., to Boston and Buffalo, N.Y.; and a spoked Midwestern configuration, centered on Chicago.

As of August, $2.4 billion had been spent, according to *Time*, "much of it on planning, design, and other pre-construction work." Nearly the entire $10.1 billion overall budget has been committed. The DOT has fielded applications for more than $75 billion from 39 states, the District of Columbia, and Amtrak, which should come as no surprise given the sorry state of the nation's infrastructure.

Current efforts focus largely on upgrades to existing lines, like the one between Chicago and St. Louis. Frustratingly, the trains on these routes still may not be fast enough to compete with air travel, which rather defeats the purpose. But ground-up, truly high-speed construction is part of the plan in some regions. An entirely new line has been proposed between Dallas and Houston, for instance. And construction inches forward on the California corridor.

Pelli Clarke Pelli Architects, based in New Haven, Conn., designed the 1.5-million-square-foot Transbay Transit Center in San Francisco as the California route's northern hub, evidence that high-speed rail can translate directly into architecture commissions—and not just for stations, but for a host of transit-oriented developments.

The Northeast is the country's most populous and prosperous region, and it needs better passenger train service. Amtrak's Acela, the closest thing in the U.S. to high-speed rail, has massive ridership. Alas, it peaks at 135 miles per hour on the run from D.C. to New York, and according to *The Washington Post* averages just 84 miles per hour due to infrastructural inadequacies. That's a snail's pace compared to 200-mile-per-hour top speed of Japan's famous bullet train—which is 50 years old.

The Northeast Maglev hopes to extend its proposed D.C.-to-Baltimore line all the way to New York. Maglev trains, as their name suggests, levitate on magnetic fields while traveling at high speed (though they do rely on a wheel-and-rail system at low speed). The technology was developed by the Central Japan Railway Co., and the Japanese government, eager for an export opportunity, is offering $5 billion toward the $10 billion estimated cost of the D.C.-to-Baltimore run.

Amtrak has its own proposal for the Northeast Corridor: two entirely new tracks configured for conventional (as opposed to maglev) high-speed trains, for a development cost of $151 billion, a travel time of 94 minutes from D.C. to New York, and speeds of 220 miles per hour. By contrast, on the same route, the Northeast Maglev claims a cost of $100 billion, a travel time of 60 minutes, and speeds of 300-plus miles per hour. By the numbers, the maglev proposal looks like a winner: lower cost, higher speed, less time. If only the rest of the country had such options. Trains may seem hopelessly old-school, but they really are the future.

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PETER AARON

Peter Aaron started his career as a cinematographer before moving to still photography 35 years ago. Early in his career, Aaron apprenticed with architectural photographer Ezra Stoller and began working on his own two years later, combining Stoller's compositional approach with the use of dramatic camera angles, theatrical lighting, and cinematic techniques. He has photographed projects by many of the most influential architects of the last 30 years, including Robert A.M. Stern, FAIA; Rem Koolhaas, Hon. FAIA; Charles Gwathmey; Michael Graves, FAIA; Peter Eisenman, FAIA; Robert Venturi, FAIA; Rafael Viñoly, FAIA; and Skidmore, Owings & Merrill. He has also been a contributing photographer for *Architectural Digest* and his images frequently appear in other magazines and books.

Aaron says that he tries to find the "Platonic ideal" of each structure: to show the building as the architect originally envisioned it. Along with considerations of color and contrast, he aims for a certain complexity of composition, often creating several views within each larger picture. These mini-frames increase the time it takes the viewer to appreciate the overall design—which he sees as the essence of a successful photograph.

See Aaron's cinematic approach to architectural photography in his shots of Robert A.M. Stern Architects' Tour Carpe Diem on page 84.

ANDREW AYERS

Andrew Ayers studied at the Bartlett School of Architecture, University College London, and City University London, and has lived in France for more than a decade. Among other books, he is the author of *The Architecture of Paris*, a guide to the city's built fabric from Gallo-Roman times to the present day. He is also an architectural journalist, his writing having appeared in *032c*, *The Architectural Review* (to which he is a regular contributor), *Numéro*, *PIN–UP* magazine (of which he is the associate editor), and others. When not writing about architecture and the history of his adopted city, you'll find Ayers teaching on Columbia's New York/Paris program or working as a docent at the Maison de Verre.

Read Ayers' study of the new renovation of Paris' Eiffel Tower on page 64.

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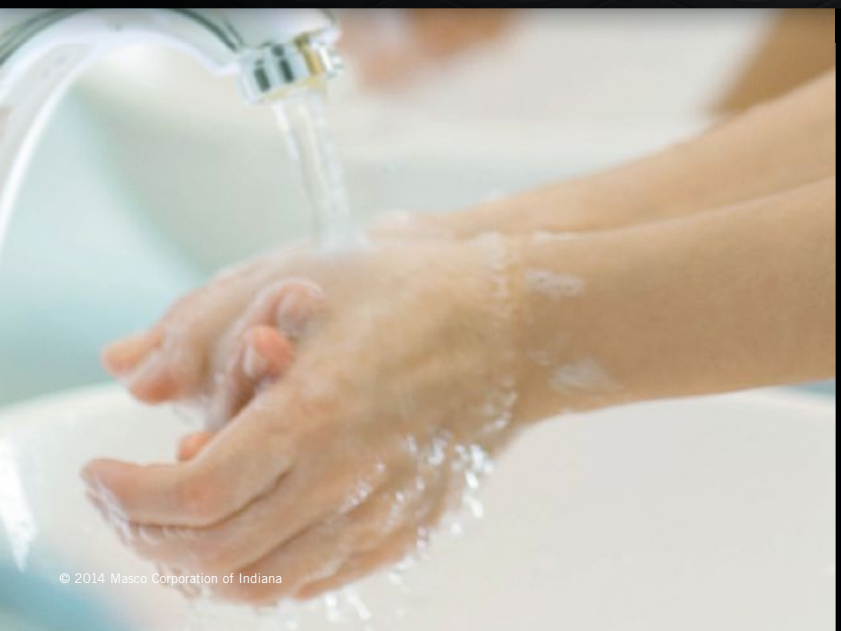

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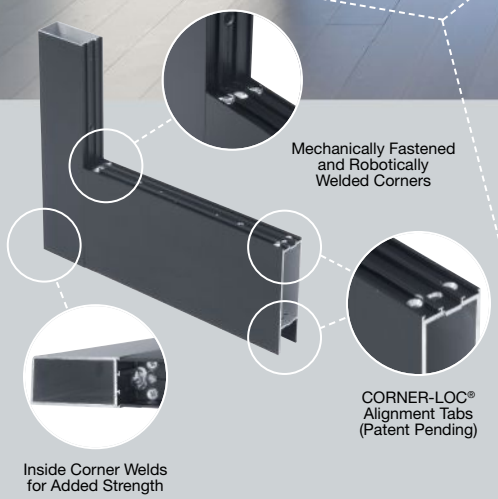

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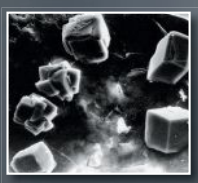

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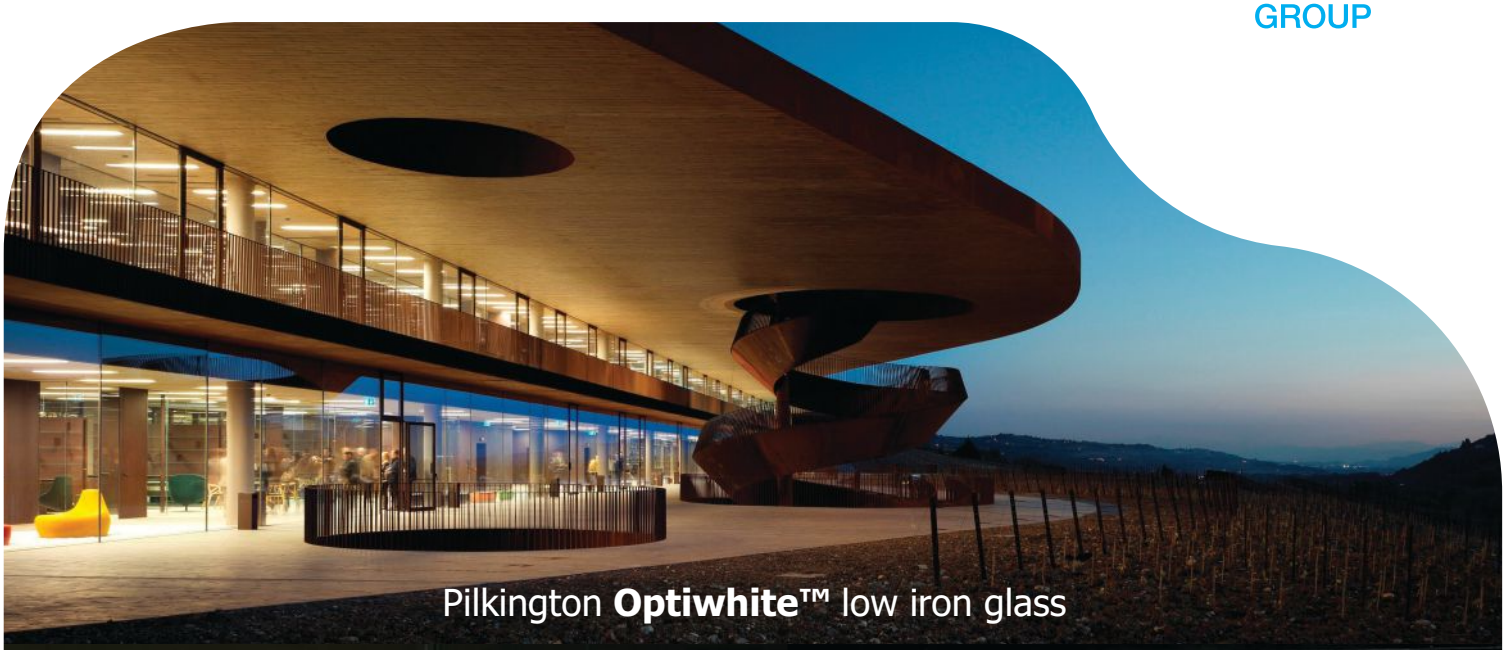

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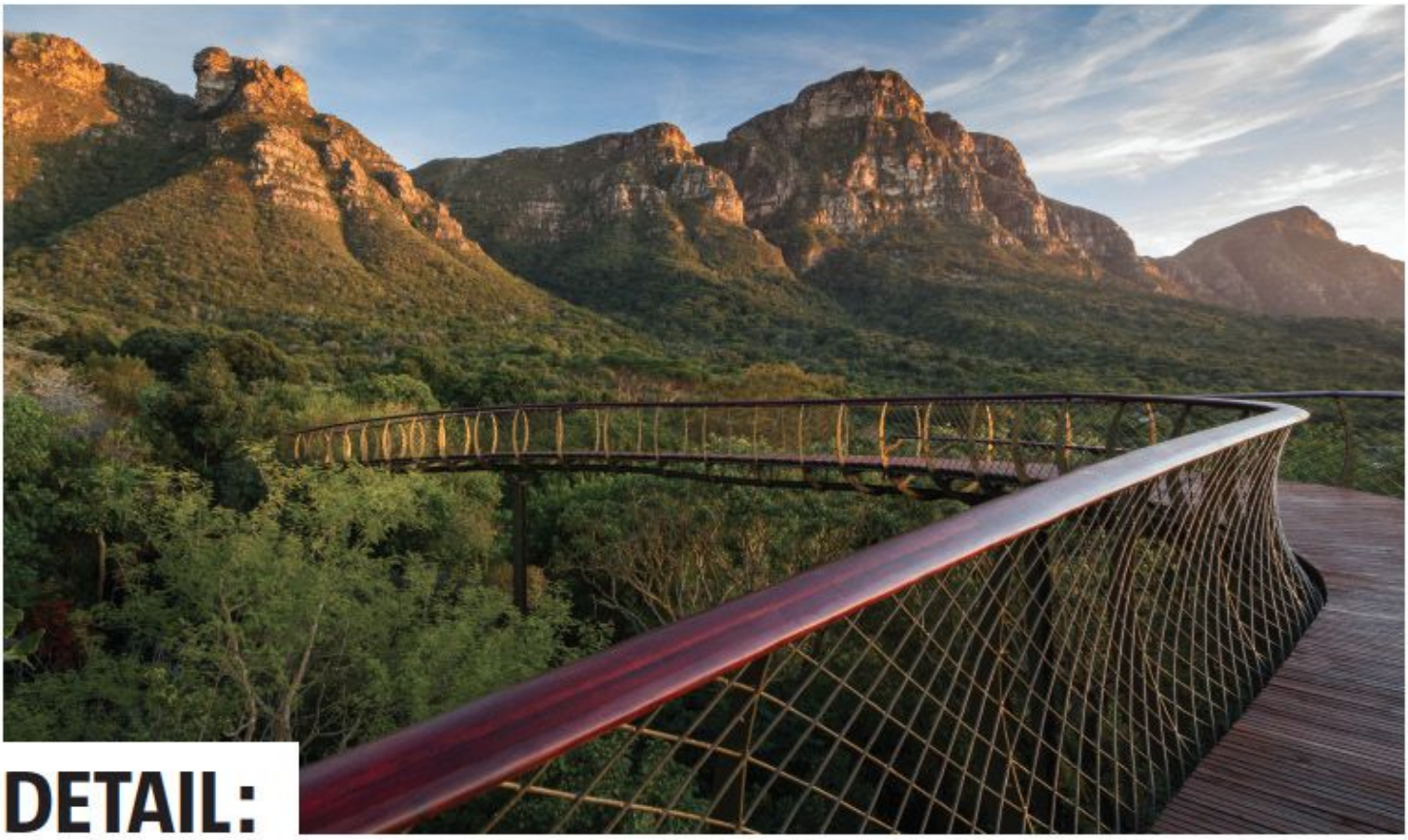
FRONT

STILL GROUNDED, BUT READY FOR TAKEOFF

Last month, we joined an Open House New York tour of Eero Saarinen's TWA Flight Center. Completed in 1962, named a New York City historical landmark in 1994, shuttered with its namesake airline in 2001, added to the National Register of Historic Places in 2005, and renovated by Beyer Blinder Belle in 2011, the terminal's head house still awaits its promised future as part of a hospitality development. Plans with hotel magnate André Balazs fell through in January. The Port Authority has since solicited new bids; Trump, Marriott, and others are rumored to be contenders.

CONNIE ZHOU

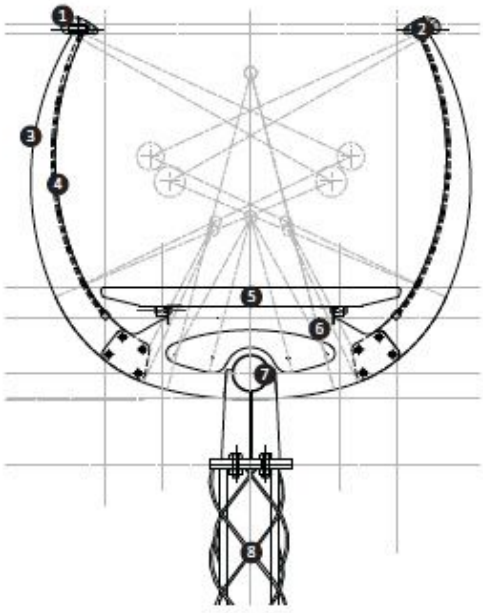


DETAIL:
KIRSTENBOSCH CENTENARY TREE CANOPY WALKWAY

TO CELEBRATE LAST YEAR'S centennial anniversary of the Kirstenbosch National Botanic Garden in Cape Town, South Africa, the South African National Biodiversity Institute (SANBI) commissioned a 426-foot-long aerial walkway through the garden's arboretum. The Centenary Tree Canopy Walkway takes visitors 40 feet up, through, and above a forest of approximately 450 indigenous species.

The structure was designed by Mark Thomas, of local firm Mark Thomas Architects, in collaboration with local structural and civil engineering firm Henry Fagan & Partners and SANBI horticulturist Adam Harrower. "For this project, Mark and I worked together to integrate everything so that many of the components serve both a structural and architectural purpose," says Henry Fagan, principal partner at his namesake firm. None of the 400-plus trees in the walkway's path was affected by the 19.6-ton steel-and-wood structure. "At one point, where a tree could not be avoided, a branch of a tree extends vertically through the walkway," he says. **EMILY HOOPER**

Walkway Section



1. Padauk wood handrail
2. 80mm × 40mm × 6mm galvanized mild steel (GMS) box section
3. 8mm GMS curved rib stanchion
4. Two-ply Ø10mm GMS rod mesh
5. 25mm × 76mm treated-pine plank
6. 8mm GMS central transverse frame
7. 6mm GMS pipe spine Ø165mm
8. 252mm × 252mm GMS H-section column welded to 8mm GMS mesh

Learn about the design and construction details of this sinuous aerial walkway at *architectmagazine.com*.
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UP AND RUNNING:
BE SMART IN HOW YOU STAFF

FROM ENTRY-LEVEL INTERNS to top-tier management, the business of architecture relies on smart workers. To stay competitive and endure an ever-turbulent job market, design firms need to recruit the best and the brightest while holding on to the skilled talent they already have. **NATE BERG**

TIP 1:

The layoffs during the recession may seem like fresh wounds, but the market has recovered. Demand for architects is high now due to increased work and a limited supply of professionals. "Twenty to 30 percent of the architectural workforce left in the last recession, so the talent pool is much smaller," says David McFadden, CEO of Consulting for Architects, a staffing agency. Firms need to recognize that it's a seller's market.

TIP 2:

A dearth of architects means employers need to adjust expectations and perhaps lower their hiring standards. To top it off, the limited supply is in demand—the candidates you want may be under consideration by other firms. McFadden suggests acting quickly: "Shorten the time from receiving a résumé to scheduling an interview to making an offer. ... You have to be quick; otherwise you're going to lose out to a firm that is."

TIP 3:

When seeking new talent, New York–based Robert A.M. Stern Architects partner Graham Wyatt, AIA, says firms should look broadly at the candidates' talents. Architectural ability and design skills are obviously important, but they shouldn't be the only factors considered. "Look for people who are broadly educated and, beyond that, people who are inquisitive about the world, who are not just one-dimensional," he says.

TIP 4:

Regular performance reviews are crucial for employers to track progress and for workers to get feedback and, ideally, a chance to request a raise. Communication is mutually beneficial, but it sometimes doesn't happen enough. "In some firms, the annual review only happens every two or three years," says Herbert Cannon, president of AEC Management Solutions. "That can be demoralizing to employees."

TIP 5:

Rewarding employees based on the quality of their work will push them to excel and make them feel appreciated. Robert A.M. Stern Architects uses a system as part of a profit-sharing model that, when the firm is in the black, issues an additional bonus to employees based on annual reviews. "The principle of it is important to the culture of our firm, which is to reward people at all levels so they feel that they're pulling in the same direction," Wyatt says, "and that's really essential to our success."

TIP 6:

Firms need to know how to hold on to what they've got. That was easier during the recession when many architects were happy to have any job. But now that things have turned around and opportunities are opening up, employers need to do more to keep their workers from perusing the job boards. McFadden says firms should increase compensation for the people who stuck with them during the recession, and even more so for those who saw years pass by without a raise.

Up and Running, a monthly series on starting your own firm, is proudly supported by Graphisoft. For more Up and Running, visit *architectmagazine.com*.

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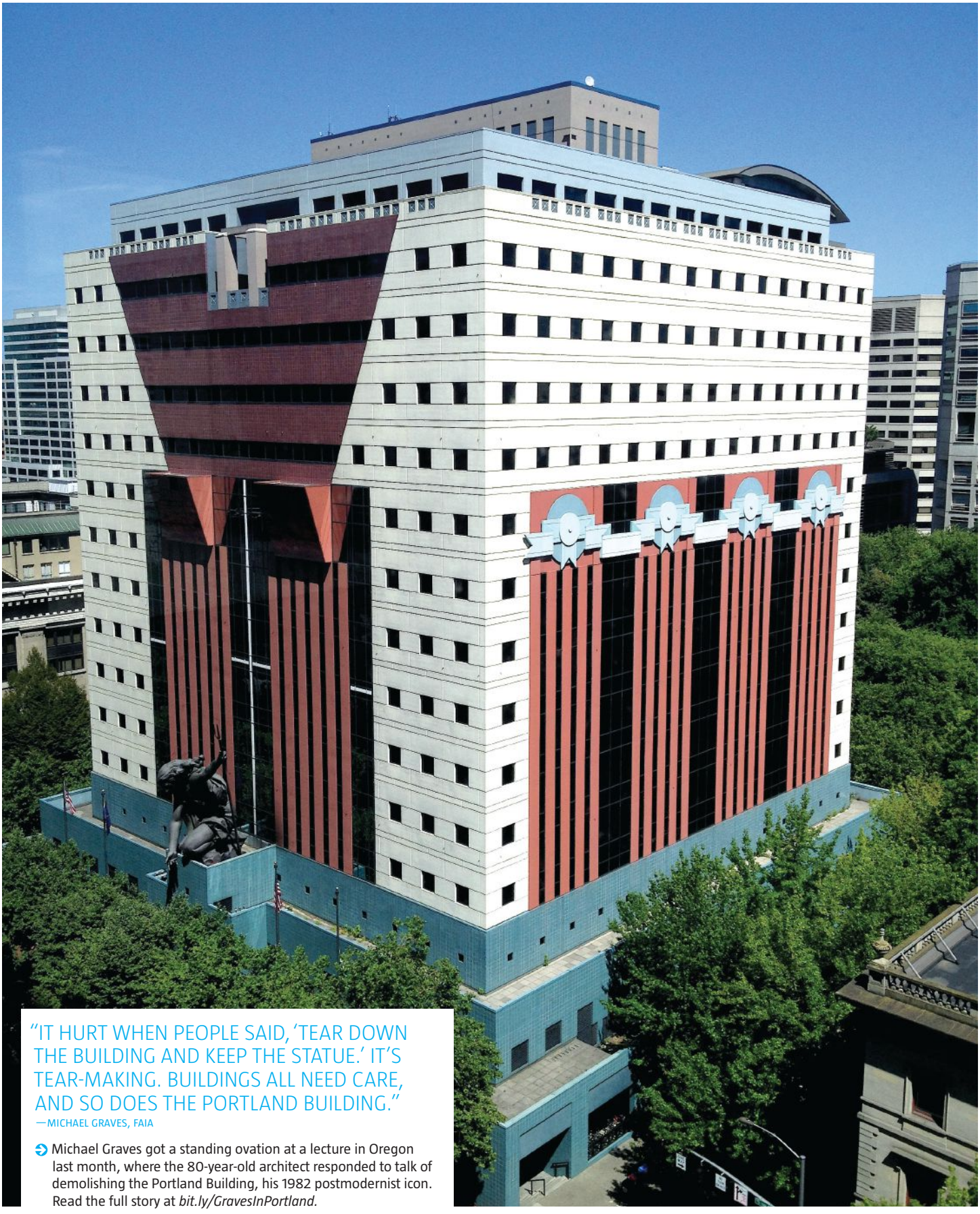

"IT HURT WHEN PEOPLE SAID, 'TEAR DOWN THE BUILDING AND KEEP THE STATUE.' IT'S TEAR-MAKING. BUILDINGS ALL NEED CARE, AND SO DOES THE PORTLAND BUILDING."
—MICHAEL GRAVES, FAIA

Michael Graves got a standing ovation at a lecture in Oregon last month, where the 80-year-old architect responded to talk of demolishing the Portland Building, his 1982 postmodernist icon. Read the full story at *bit.ly/GravesInPortland.*

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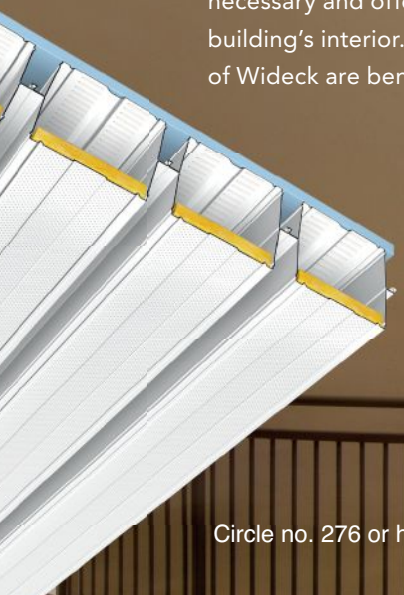

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CHICAGO DESIGNER IKER GIL, DIRECTOR OF MAS STUDIO AND EDITOR-IN-CHIEF OF *MAS CONTEXT*, COLLABORATED WITH LUFTWERK ON A LIGHT INSTALLATION FOR THE ROOF OF BERTRAND GOLDBERG'S MARINA CITY.

Read more at *architectmagazine.com*

ON A LATE summer evening in Chicago, the rooftop of one of Bertrand Goldberg's Marina City towers came alive with a lighting installation hosted by *MAS Context* and designed by "immersive experience" group Luftwerk. *MAS Context*, a quarterly journal from Iker Gil's Chicago-based firm MAS Studio, had previously organized a traveling exhibition entitled "Inside Marina City." For this installation, Gil collaborated with Petra Bachmaier and Sean Gallero of Luftwerk to interpret drawings of Marina City into a site-specific video on the roof of its west tower.

How did the Marina City roof installation come to fruition?
I've been living in the building for 10 years. Apart from my architecture work [with MAS Studio], I also do a series of publications. Luftwerk had lectured at my program: They had done an installation at Fallingwater, and they [just held] one at the Farnsworth House. I thought, why not use the roof of Marina City? So we held a one-day event, for about four hours. It was fantastic to see how the people from Marina City interacted with it. Luftwerk used all original drawings for Marina City as inspiration.

Do you feel these kinds of exhibitions benefit the field and the public?
It's very interesting for architects to find ways of talking about the value of architecture through non-architectural means. Otherwise what happens is we have the same thing as [Goldberg's] Prentice [Women's Hospital], where it gets destroyed because people don't understand why it was so interesting and so important. We shouldn't be waiting until we know it's going to get demolished, we should be celebrating these buildings. **DEANE MADSEN**

DAVID SCHALLIOL

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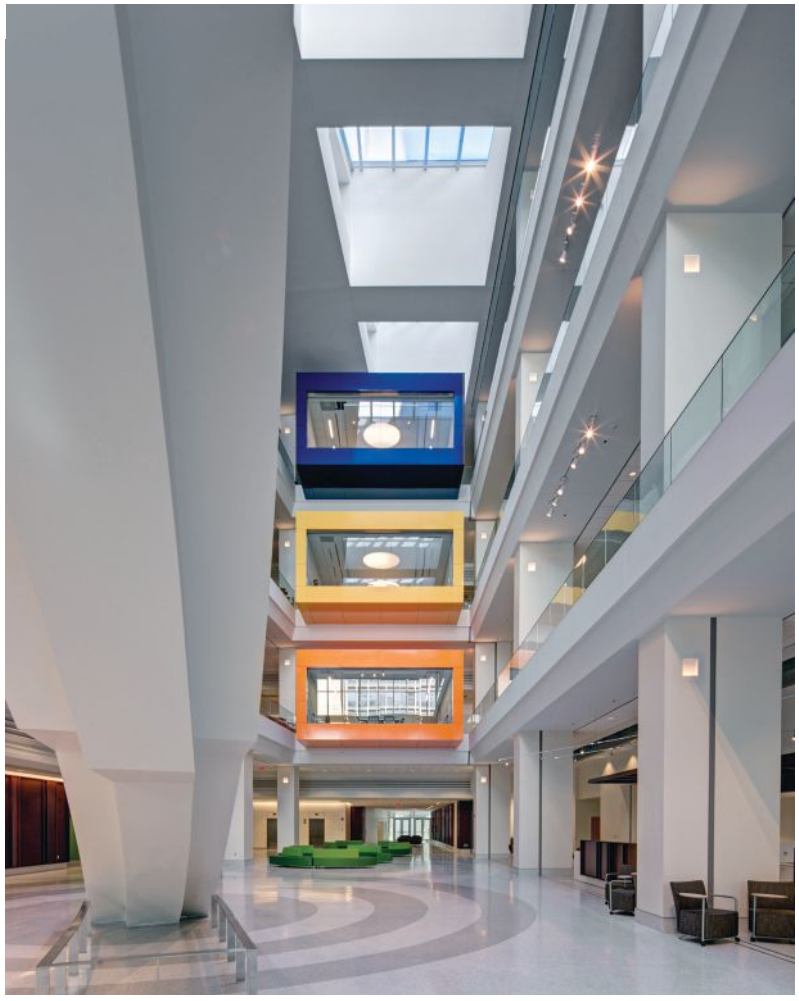
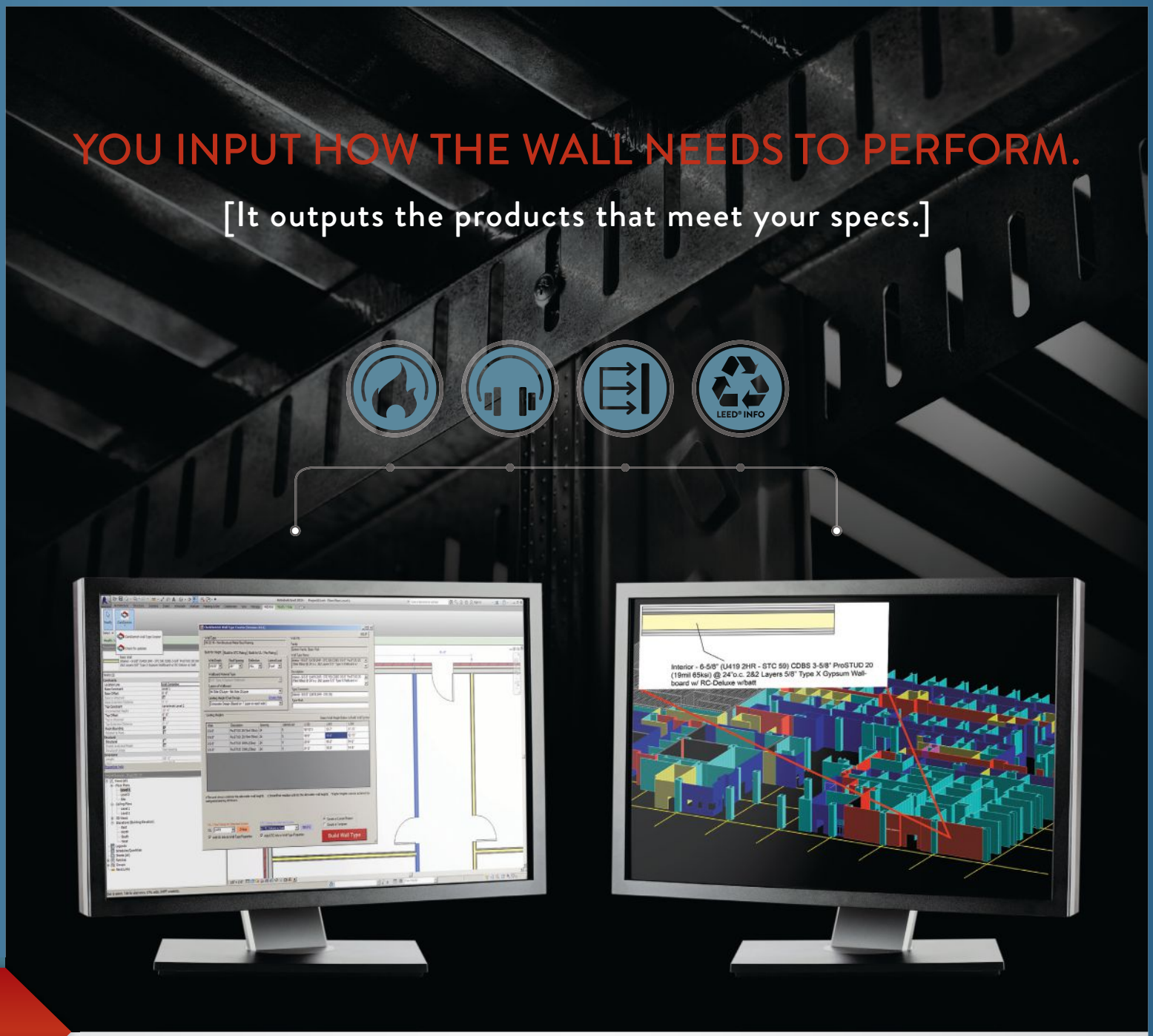
On The Boards: Shanghai Nature Museum, Shanghai (top)
Notable Work: National Institutes of Health Porter Neuroscience Research Center, Phase II, Bethesda, Md.(right, completed 2014); Miami Dade College, Academic Support Center, Kendall, Fla. (below, completed 2012).



Every month we dedicate this space to work that architects have uploaded to our online Project Gallery. Publish yourself at *architectmagazine.com/projects.*

TOP: PERKINS+WILL; BOTTOM LEFT: ROBIN HILL; BOTTOM RIGHT: HEDRICH BLESSING



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↑ 0.3 pt

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53.8
↓ 3.2 pts

Commercial
50.8
↓ 0.1 pt

Multifamily Residential
55.3
↓ 1.6 pts

BRIDGING THE DIVIDE IN D.C.

The 11th Street Bridge Park Competition jury unanimously selected the team of Rotterdam, Netherlands–based OMA and Philadelphia-based OLIN to design a park in Southeast Washington, D.C., spanning the Anacostia River. In addition to a unanimous jury selection, the team's design, "Anacostia Crossing" received the highest marks from the competition's Design Oversight Committee comprised of community stakeholders and the most votes in a public poll of more than 1,100 participants. OMA and OLIN beat three other teams: Balmori Associates and Cooper, Robertson & Partners; Höweler + Yoon Architecture and Stoss Landscape Urbanism; and NEXT Architects and Wallace Roberts & Todd. **CAROLINE MASSIE**

10 MILLION

Number linear feet of carbon fiber that the Los Angeles office of AECOM recently used to reinvent a beloved Southern California icon: the surfboard. The project, named Hang 10 Million, is captivating not for its function but its suggestion for a skeletal form made from a collection of thin, high-strength materials. While carbon fiber could be costly and energy-intensive, the idea could substitute natural fibers. **BLAINE BROWNELL, AIA**

Read the full story at *bit.ly/CarbonFiberSurf*.

ADP NATIONAL JOB GROWTH IN THOUSANDS

THREE TAKEAWAYS FROM NCARB'S RECENT ANNOUNCEMENT ON INTERNSHIP CHANGES

On Sept. 22, the National Council of Architectural Registration Boards (NCARB) announced changes to its Intern Development Program (IDP). The changes involve eliminating the 1,860 elective hours and reducing the current 17 experience areas into six practice-based categories. Since that announcement, we have learned these three things. **CAROLINE MASSIE**

1 State boards do not have to adopt the new IDP changes. NCARB is made up of 54 jurisdictions, each of which has the legal authority to establish and enforce its own licensure requirements. Candidates applying for licensure must comply with the policies of their state's regulatory board, but candidates may also contest a state board's decision if they do not agree with its policies.

2 Planned for June 2015, cutting the program's elective hours is meant to focus curriculum on the core requirements of 3,740 hours. NCARB's assistant director of member board relations, Derek Haese, said that the scaling back of elective hours will not diminish the efficacy of the IDP, that there needs to be "rigor for a reason, not rigor for the sake of rigor."

3 Planned for mid-2016, the overhaul phase will bring the IDP up to date with the six topics tested in the new Architect Registration Examination 5.0, set to launch in late 2016: practice management, project management, programming and analysis, project planning and design, project development and documentation, and construction and evaluation.

September Jobs Report

New construction jobs reported by the U.S. Department of Labor's Bureau of Labor Statistics

11,800	+ 500	+ 3,200	+ 6,000	= **21,500**
Residential Construction	Heavy and Civil Engineering	Nonresidential Construction	Architectural and Engineering Services	Total Construction Jobs Added

STEP UP

Sheila O'Donnell, Hon. FAIA, and John Tuomey, Hon. FAIA
2015 Royal Gold Medal for Architecture
The Royal Institute of British Architects (RIBA)

The co-founders of Dublin-based O'Donnell + Tuomey Architects have also been shortlisted for RIBA's Stirling Prize a record five times.

Faith Rose, AIA
Executive Director
Public Design Commission of the City of New York

Rose is now head of New York City's Public Design Commission, which reviews projects for property owned by the city, replacing Jackie Snyder.

C. Keith Boswell, FAIA; Brant E. Coletta, AIA; Laura Ettelman, AIA; Kenneth A. Lewis, AIA; and Jonathan Stein, AIA
All named partner
Skidmore, Owings & Merrill

Steven White, AIA
Principal and director
Fentress Architects, Washington, D.C., office

Kaia Nesbitt
Site design principal
HDR, Denver office

David Varner, AIA
Workplace practice leader
SmithGroupJJR

Michael McGroarty
Senior associate
Kuth Ranieri Architects, San Francisco

Ty Tabing
Executive director
Chicago Architecture Biennial

Joseph Grima
Director
Ideas City festival, New Museum, New York

Maya Lin
2014 Dorothy and Lillian Gish Prize

The artist and designer won the prize, which includes a $300,000 arts award. Best known for her design of the 1982 Vietnam Veterans Memorial in Washington, D.C., Lin's current project is a memorial on climate loss and biodiversity called "What is Missing?"

STEP DOWN

Alejandro Zaera-Polo
Dean
Princeton University School of Architecture

Richard Sarles
General manager and CEO
Washington Metropolitan Area Transit Authority

Sarles announced that he will leave his position at the Washington, D.C., organization in January.

TOP: OMA

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PHOTO: CARL BOWER

AIAVOICES

THE DESIGN STRATEGIST | ARCHITECTURE PLUS

Evelyn Lee, AIA, a 2014 AIA Young Architects Award recipient, is part of the strategy team at MKThink, a San Francisco–based research, planning, and design firm. Lee, who has been active in the AIA's Repositioning efforts, holds graduate degrees in architecture, public administration, and business administration, and is an advocate for architects to expand the definition of their traditional roles. "As an architect, I do not thrive as a designer of buildings, project manager, or construction administrator," she says, "and so I have really found my place as a design strategist and communications expert."

THE PROFESSION, IN GENERAL, WOULD LOOK AT ME AND SAY that I'm in an alternative career. But I tend to look at it as "architecture plus." If we want to be seen as trusted advisers, we have to expand the ways in which we think about what we do and how we do it. Most of all, though, we need to expand how we're perceived by the community as a whole. In my role as a strategist, I get involved very early in the process, when decisions are made about spending capital assets. What I offer clients, then, is design thinking upstream rather than responses to pre-existing conditions.

Because of the economic recession, architects are ready to embrace a higher degree of change and slightly more risk than they were, say, a decade ago. The field is competitive. Recent architecture graduates that I know are excited about what they can bring to the community, for instance, and there are lessons there for more established architects to rethink their career arcs.

But digital engagement is the front door to a lot of opportunities for firms to demonstrate their design thinking. As Internet 2.0 makes way for the "Internet of Things," architects have a greater ability to quantify their designs using data. The product that architects offer our clients is typically buildings, but the service we provide often creates simple solutions out of complex organizational problems.

Architects, as design thinkers, are actually systems thinkers. Designing a building is not a linear process. I have a business background along with architecture, and in traveling through those two worlds I've found that what architects bring to the table is a holistic outlook on what needs to be done, and why, by identifying external forces that impact a project and by seeing how the design process will ultimately drive the construction process.

—As told to William Richards AIA

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By William Richards
Art Direction by Jelena Schulz

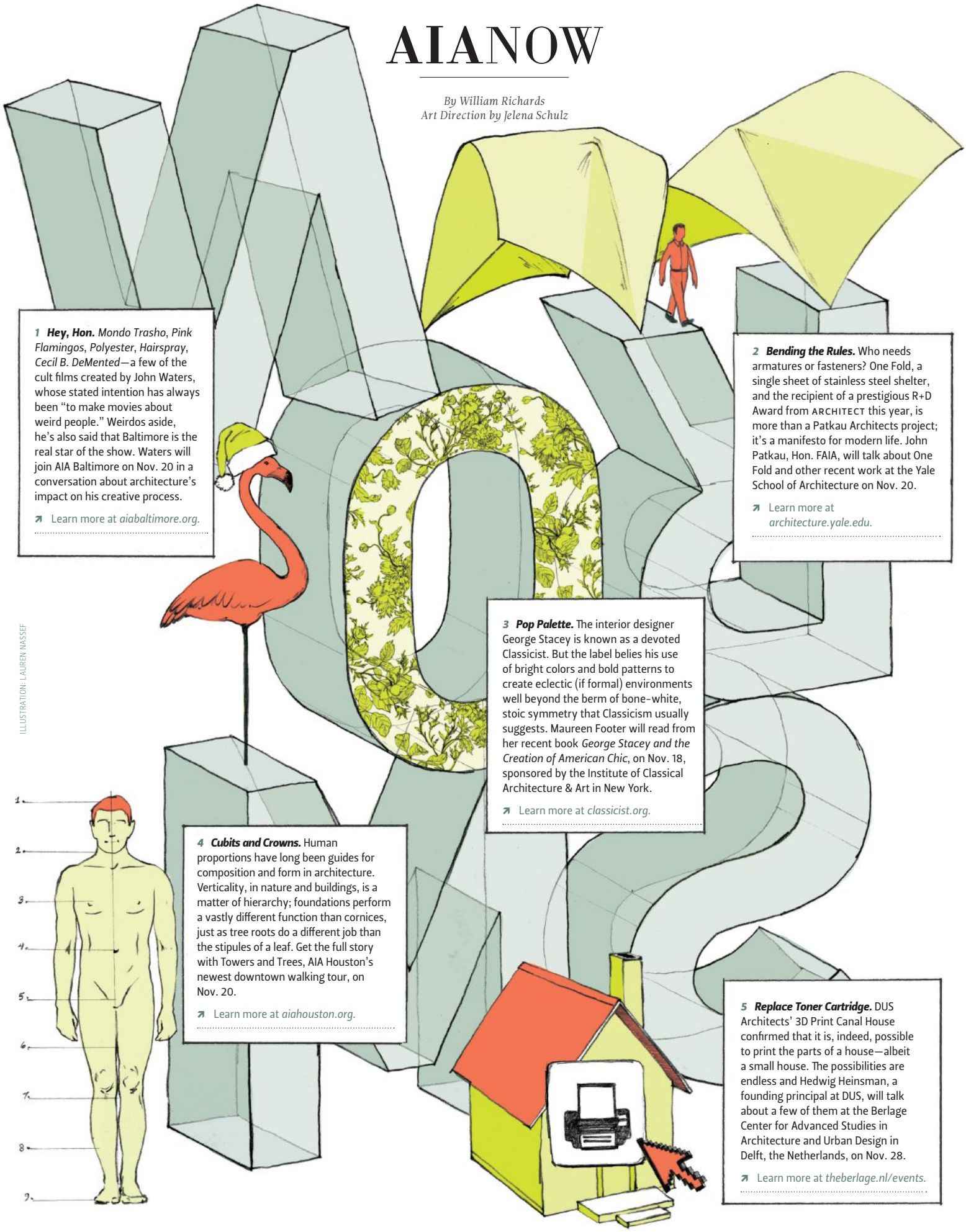

ILLUSTRATION: LAUREN NASSEF

1 Hey, Hon. *Mondo Trasho*, *Pink Flamingos*, *Polyester*, *Hairspray*, *Cecil B. DeMented*—a few of the cult films created by John Waters, whose stated intention has always been "to make movies about weird people." Weirdos aside, he's also said that Baltimore is the real star of the show. Waters will join AIA Baltimore on Nov. 20 in a conversation about architecture's impact on his creative process.

↗ Learn more at *aiabaltimore.org.*

2 Bending the Rules. Who needs armatures or fasteners? One Fold, a single sheet of stainless steel shelter, and the recipient of a prestigious R+D Award from ARCHITECT this year, is more than a Patkau Architects project; it's a manifesto for modern life. John Patkau, Hon. FAIA, will talk about One Fold and other recent work at the Yale School of Architecture on Nov. 20.

↗ Learn more at *architecture.yale.edu.*

3 Pop Palette. The interior designer George Stacey is known as a devoted Classicist. But the label belies his use of bright colors and bold patterns to create eclectic (if formal) environments well beyond the berm of bone-white, stoic symmetry that Classicism usually suggests. Maureen Footer will read from her recent book *George Stacey and the Creation of American Chic*, on Nov. 18, sponsored by the Institute of Classical Architecture & Art in New York.

↗ Learn more at *classicist.org.*

4 Cubits and Crowns. Human proportions have long been guides for composition and form in architecture. Verticality, in nature and buildings, is a matter of hierarchy; foundations perform a vastly different function than cornices, just as tree roots do a different job than the stipules of a leaf. Get the full story with Towers and Trees, AIA Houston's newest downtown walking tour, on Nov. 20.

↗ Learn more at *aiahouston.org.*

5 Replace Toner Cartridge. DUS Architects' 3D Print Canal House confirmed that it is, indeed, possible to print the parts of a house—albeit a small house. The possibilities are endless and Hedwig Heinsman, a founding principal at DUS, will talk about a few of them at the Berlage Center for Advanced Studies in Architecture and Urban Design in Delft, the Netherlands, on Nov. 28.

↗ Learn more at *theberlage.nl/events.*

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REMOTE CONTROL | METRICS FOR A FIRM'S SOCIAL MEDIA SUCCESS

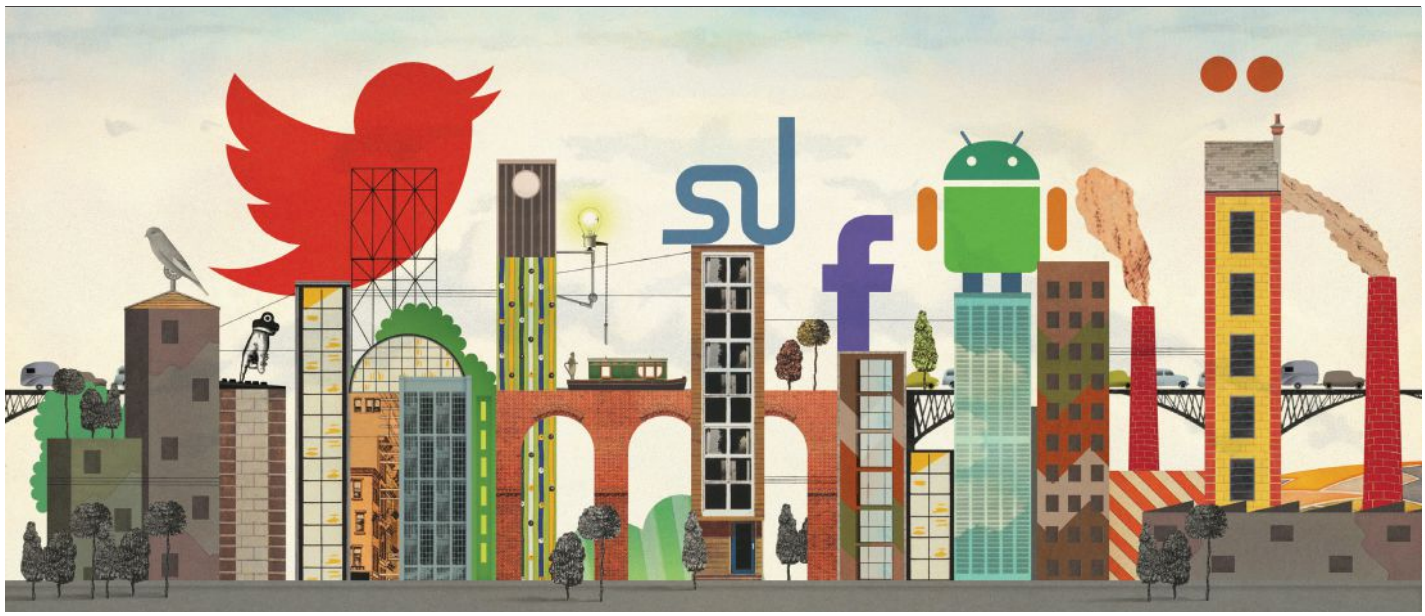


ILLUSTRATION: BRETT RYDER

IF YOU'VE PINNED OR "LIKED" A BUILDING LATELY, IT'S EASY TO forget that architecture is physical: bodies in space, steel, stone, wood, weight loads, forms, rooms, light, and site. It used to be that, half a century ago, short of leading a tour, architects had to rely on getting their work in the latest *Architectural Forum* or publishing a monograph in order to relay how the plan worked with the section—next to a Stollerized photograph, naturally.

Today, of course, architects rely on shares, badges, and tweets (as well as pins and likes) to make a digital case for their work. Looking at Web analytics on click-throughs, and as the multiplier effect takes hold, you can see in great detail how far that work has reached. Anyone, anywhere, can call a building a "favorite" without ever actually visiting it, and in albums or newsfeeds, they can share and re-share it. And, to that end, our image-obsessed digital lives present new business opportunities for architects.

"A quality image can be a direct link to business," says Steven Thomson, Architizer's content director. "Nothing can beat quality architecture—and that's not just an image, obviously, but an image can draw potential clients' attention." Architizer and other community-driven sites (like Houzz, Archinect, or ARCHITECT's Project Gallery) have in many ways replaced the hard-to-secure magazine spread or costly monograph by offering a platform to architects to self-publish. Not quite arbiters of taste in the traditional publisher sense, they retain the gatekeeper role reserved for magazines and books.

It's a gate that Jane Frederick, FAIA, a founding principal at the Beaufort, S.C., firm Frederick + Frederick, finds useful not just in how easy it is to publicize the residential work of her firm but in what it signifies to potential clients.

"These sites prequalify us in the eyes of clients—and the metric for social media success is about jobs coming through the door," she says. "We've found a lot of clients this way. There's value in the context an image depicts because you, as the architect, want to make sure people can picture themselves in those spaces."

Frederick notes, however, that the value of the image as intellectual property should not be ignored. Publishing work to community-driven sites as a business development tactic may yield clients, but—as Frederick and others find—it may also yield surprises when you find your images on a far-flung blog, butchered through resizing or cropping.

Beyond the potential quality-control issues surrounding images that leave your custody, another peril that some architects report is that the quality of your architectural ideas can be stolen by enterprising DIYers. If they have the idea, then surely they don't need an architect, right?

Jeff Echols, AIA, who runs the blog architectoftheinternet.com, disagrees. "Social media is a new value proposition for architects," he says, "which I'd characterize as, 'Look, I'm not afraid to give you this information about how I work or what I do, but at the end of the day I'm the only person that can do it for you the right way.' "

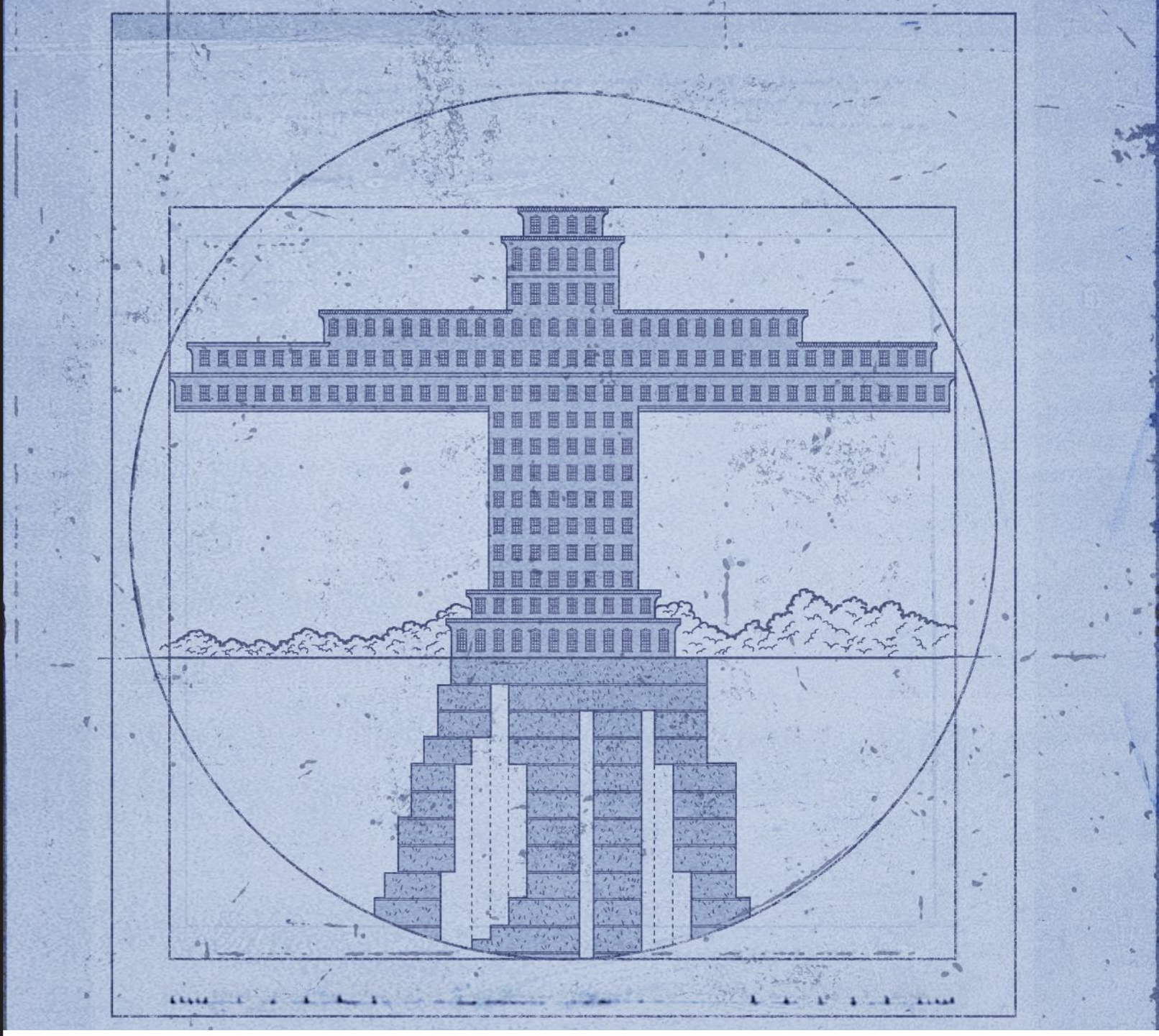
"The metric for success in social media is a strategy question. I think ROI is misleading here, because your return is about more than a financial investment," he says. "If your objective is to bring clients to your door, then you have to engage them with the work that you do best on the basis that you are the best at what you do."

Analytical tools to measure raw engagement numbers are easy to use, and even without them, basic statistics such as the number of times one of your posts or projects has been shared can give you a good indication of what grabs attention and what doesn't.

Paying attention to those distinct levels of engagement, says Thomson, can help you form objectives for your firm. "When you tweet," he says, "who is responding? What companies do they work for? Are you cultivating conversations with your posts, or just throwing your work out there?"

Echols urges architects to think critically about their strengths as a firm. Based on that, he says, identifying the right audience will lead you to identifying the right social media platform. "Sure, Facebook versus Pinterest is a fine debate," he says, "but it has to be driven by where your audience resides. If it's homeowners, maybe Houzz. If it's local school boards, maybe LinkedIn."

In cultivating conversations on community, the image is also an opportunity to cultivate the architect. "Communicating that there are real people behind the firm's work is essential," says Thomson. "People view architects as inherently savvy people. It only makes sense that they would embrace social media." —*William Richards* AIA



Designs on Health

New research advances the alignment of design and public health

THE GROWING RECOGNITION THAT DESIGN CAN AND SHOULD PLAY a central role in addressing today's complex health challenges has catalyzed architects and public health officials to explore potential solutions. Fourteen new research reports issued by the AIA—and authored by participants of the Design and Health Summit hosted by the AIA, the American Institute of Architects Foundation (AIAF), and the Association of Collegiate Schools of Architecture (ACSA) in April—examine how design and public policy can shape healthier environments, both built and natural environments. The reports document successful design interventions and proffer strategies for creating active, connected, toxin-free, optimized, and equitable spaces for the 21st century.

In September, and building on the momentum from the April summit, the AIA, AIAF, and ACSA launched a research consortium on design and health comprised of university teams that will develop opportunities for funded research, publications, and resources. Inaugural consortium members, set to be announced in early December, will identify unexplored and underrepresented areas

of knowledge in underscoring how the design process and product can positively impact our communities. Beyond adding new data and insights to the discussion, the reports and the consortium are intended to equip and compel architects to take action.

"We're moving into a new era of collaboration with increased focus on translation of health research into practice," says Dr. Matthew Trowbridge, associate professor at the University of Virginia School of Medicine and co-author of two of the reports. "Working from this perspective, I strongly believe my own built environment and health research is not truly complete until my architect, planning, and other designer friends know what to draw."

Trowbridge and his research partner, Terry Huang, professor at the CUNY School of Public Health, collaborated with Charlottesville, Va.–based VMDO Architects to study how health-promoting educational design strategies can reduce incidence rates of childhood obesity. The team leveraged its evidence-based research in the design of Buckingham County Primary and Elementary School in Dillwyn, Va., with the primary goal of supporting healthy eating and physical activity.

The partnership inspired the development of "Healthy Eating Design Guidelines for School Architecture," available free for download from the Centers for Disease Control and Prevention (CDC). "We wanted to translate our hands-on collaboration into a practical tool that architects can use," Trowbridge says. "While it's focused on school environments, we really meant it to serve as a template for use in a variety of contexts."

Health and wellness within dementia care facilities is the focus of a report authored by Kyle Konis, AIA, assistant professor of architecture of the University of Southern California, working in collaboration with the USC David School of Gerontology and the Irvine, Calif.–based Silverado dementia care facilities provider. The team hopes the research spurs the development of empirically based environmental lighting requirements and performance criteria to guide the design and operation of these specialized environments.

Another report, by Omar Youssef, a doctoral candidate in sustainable environments at the University of Arizona, proposes the framework of a design index for therapeutic architecture. This matrix would be used as a benchmark to help architects create environments that optimize luminous intensities for human health and performance.

At the Neighborhood Scale

It is not enough to say that how we design impacts our quality of life. Regional and local factors demonstrate that correlations between design and health define a broader spectrum of causality.

"In the United States, your ZIP code is a fundamental determinant of the length of your life," says Susan Rogers, assistant professor at the University of Houston and director of its Community Design Resource Center. "That says something about how the neighborhoods in which we live actually impact our opportunities to be healthy."

Rogers led a team that studied four low-income Houston neighborhoods to identify the determinants of health that can be impacted by design, including education, economic opportunity, environmental justice, food security, neighborhood stability, public space, safety, and amenities.

"We looked at what it would mean to focus investments in these neighborhoods to improve the public infrastructure and resilience," she says. "The goal is to reinforce the areas of a neighborhood that are already working well as a means to build on that success so it will ripple through the rest of the neighborhood."

Inspired by the allotment gardens that are prevalent throughout Europe, another report proposes redeveloping the sites of abandoned retail centers into permanent residential communities of 100 to 300 modestly scaled garden homes.

"One of the benefits of this concept is that it allows you to hang on to some of the essential ideals of the American Dream: your own piece of land, your own home, and the ability to grow your own food," says Greg Tew, associate professor in the School of Architecture + Design at Virginia Tech, who co-authored the report.

The proposal introduces a healthier, more affordable alternative to the two dominant living arrangements in the United States: urban multifamily dwellings and suburban single-family homes.

"Working together and learning together, we can start to re-establish a culture of food growing, a true sense of agriculture rather than the agribusiness model that we've evolved to," Tew says. "To be outside, breathing the fresh air and engaging with neighbors, is a more holistic solution to some of our culture's most significant problems, all of which directly impact the quality of our health."

And a research group at Texas A&M University studied the actual health impacts of moving into walkable communities, using focus groups and online surveys to examine the degree to which individuals increased their physical activities, interactions, and social cohesion after relocating to the Mueller neighborhood in Austin.

Through a systematic review of LEED 2009 documentation, one research team discovered a lack of clarity and consistency in health-related language and outcomes, including numerous nontraditional terms from a public health perspective.

"As green building has matured as a movement, it is now necessary to become more intentional about the health and wellness component of our reference guides and tools," says Trowbridge, who co-authored the paper alongside researchers from the U.S. Green Building Council. "Any time you start a truly new cross-disciplinary dialogue, you find that there's a need to understand each other's language."

Another team surveyed publications of the National Academy of Sciences' Institute of Medicine and National Research Council to highlight relevant themes that have informed science, policy, and practice. Its aim is to help unite design and health practitioners around the shared goal of shaping public policy to improve wellness.

All participants at the April Summit contributed to an interactive exhibit at the AIA to explore the topic of a common vocabulary. Over the two-day event, architects and designers learned from the health professionals, and vice versa, to establish a new level of discussion about design and the public's well-being.

Aside from the AIA, AIAF, and ACSA research consortium, the other outgrowth of the April summit is the AIA's health-focused policy framework (currently in development) to positively influence building codes, rating systems, housing issues, and zoning challenges. The AIAF also plans to launch a communities initiative that builds upon the AIA's 47-year history of the Regional/Urban Design Assistance Team program to encompass community-based solutions that focus on healthier outcomes for the public who interact with those spaces. In the end, making the case for design's impact on health has to be a collaborative and data-drive effort. The goal is to make the two words synonymous, even if they individually encompass distinct histories.

—Mike Plotnick AIA

↗ Learn more about AIA's Design and Health initiative at www.*aia.org/designhealth*.

ILLUSTRATION: MICHAEL GLENWOOD

AIAPERSPECTIVE

CAPITAL SHARES | SOCIAL MEDIA AND SOCIAL AGENCY

PHOTO: WILLIAM STEWART

A FEW MONTHS AGO, A COMMUTER IN A WASHINGTON, D.C., METRO station was so engrossed with something on his iPhone that he walked right off the platform and into the path of an approaching train. Only quick action by two bystanders saved his life.

Technology sharpens our intellects, but engaging with it can also dull the senses that make us sharply aware. Sometimes I think we're so saturated by Twitter, Facebook, LinkedIn, Pinterest, and Instagram that our mental bandwidth is at the risk of crashing, whether the subject is politics or an oncoming train. For many, checking a smartphone is their last action before bedtime or the first thing they do in the morning. According to some researchers, the average person interacts with their smartphone more than 100 times per day.

What does this have to do with architecture? More than you might think. In his 2009 book, *Here Comes Everybody: The Power of Organizing Without Organizations*, Clay Shirky observes that all businesses are media businesses "because whatever else they do, all businesses rely on the managing of information."

In that sense, yes—architects are in the business of managing information, information about a profession that has a significant impact and influence on people's lives.

Thanks to innovations in social media, individual architects and firms have many more ways to cultivate the public's interest in architecture. Using these tools—and doing so wisely—should be part of every architect's business plan. At the same time, we should not confuse the number of click-throughs with long-term and consequential engagement that leads to meaningful action.

As undeniably useful as social media platforms are, as a tool with which to talk about our work, they are no substitute for face-to-face engagement, which banks emotional capital and builds trust.

While you're still forming (or now executing) your social media strategy, with engagement and business development goals, old-fashioned outreach remains vital to a healthy practice. AIA components everywhere provide creative opportunities for members to get together with each other, AEC professionals, and potential clients. In some cities and towns, centers for architecture provide other opportunities to make personal connections. And the AIA Foundation's five Regional Resilient Design Studios, which will provide targeted information and training on how weather events have (and will) impact our communities, offer yet another opportunity to forget about "likes" and retweets for a while, and commit to a purpose-driven process that relies on your cooperation with the person sitting next to you.

In my own state, I've seen how the public's innate curiosity about architecture can be transformed into passion. In the 10 years since the Virginia Center for Architecture opened its doors, a powerful public constituency pushing for design excellence in Richmond and throughout the commonwealth has emerged.

This rise in an engaged public is not unique to Virginia. From coast to coast, architecture centers and foundations are fostering a demand that public officials be held accountable for decisions about natural and designed resources, and that public input be solicited at the very beginning of discussions affecting the shape of their neighborhoods and communities. Indeed, their very lives.

As our work gets better, I'm convinced we become better at doing our work, thinking more critically, and designing from a broader foundation of awareness and experience.

So keep tweeting or pinning or sharing or posting, and people will continue to learn more about your architectural practice and the value of what architects do. But keep contributing—in person—to the hard work that needs to be done in our communities, too. The future may be enriched by social media, but it will be shaped only by the design decisions we make today and the real spaces we'll inhabit tomorrow. AIA

Helene Combs Dreiling, FAIA
2014 President

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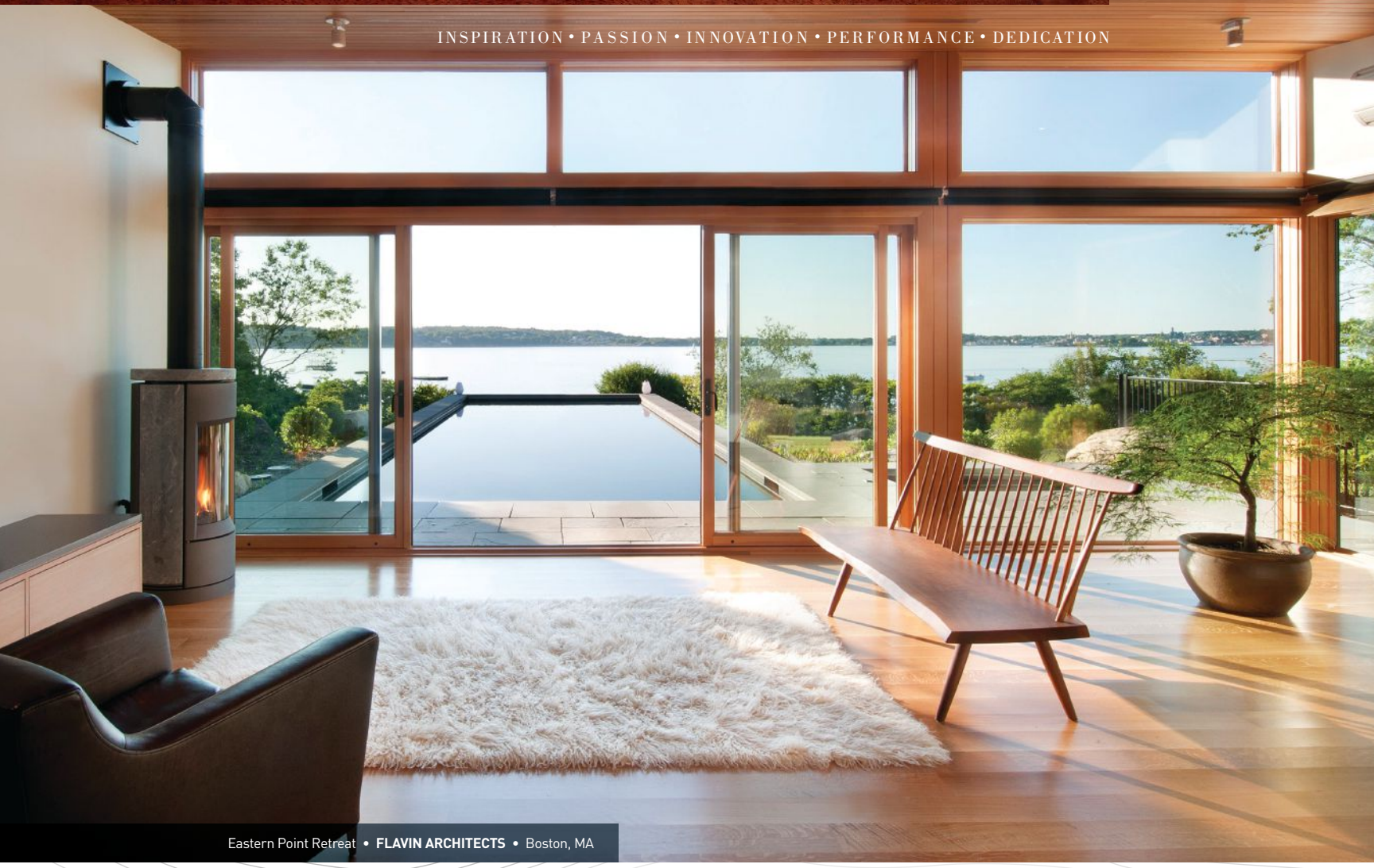

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FROM IDEA TO ICON

DESIGNING AND BUILDING WITH TENSILE ARCHITECTURE

Presented by:

BIRDAIR

LEARNING OBJECTIVES

By the end of this educational unit you will be able to:

1. Compare and contrast the benefits of tensile architecture and structures over traditional building techniques.
2. Identify the complete process—from design through construction—for creating a tensile structure.
3. Name at least three types of membrane materials and describe key properties and performance attributes of each.
4. Learn about the latest innovations and trends in the tensile membrane structures market.

CONTINUING EDUCATION

CREDIT: 1 LU

COURSE NUMBER: ARnov2014.1

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By Marissa Hovraluck, in collaboration with Michele Roth

INTRODUCTION TO TENSILE ARCHITECTURE

Tensile structures date back to the early nomadic period when people required shelter that was lightweight and portable, yet structurally sound enough to withstand harsh weather. Today, the applications and capabilities of tensile structures have evolved into permanent structures such as retail centers and institutional facilities, including museums and grandiose stadiums. Tensile membrane structures have a unique visual character and give designers, architects and engineers the ability to experiment with form and create exciting new solutions to conventional design problems.

Fabric roof forms are curved between supporting elements in a manner reflective of the flow of tension forces within the membrane. With the exception of air-supported structures, these curvatures are anticlastic in nature. The overwhelming majority of contemporary construction is based on rectilinear forms, and the curving forms of fabric roofs give a dramatic and eye-catching appeal.

Membrane can be used to construct roofs, façades, free-standing buildings, skylights and/or accent enclosures. Completely different from other building materials both aesthetically and functionally, it is the combination of uncommon physical and geometric characteristics that make tensile membrane structures iconic.

An attractive feature of tensioned fabric structures is their enormous range of spanning capability. Architects have found the inherent visual drama and the long span ability of fabric particularly appropriate for athletic and entertainment facilities such as stadia and amphitheaters. There are various membranes or films available to achieve a signature design, such as PTFE fiberglass, ETFE film, PVC and high translucency PTFE. Insulated fabrics are also available to improve the energy performance of an enclosed tensile membrane structure.

Fabric structures are not only visually appealing but also environmentally sensitive and economically competitive. Lightweight membrane provides a cost-effective solution requiring less structural steel to support the roof or façade, enabling long spans of column-free space. In addition, membrane offers building owners reduced construction and maintenance costs compared to traditional building materials.

With tensile construction, biaxial forms can be readily achieved as they flow naturally from the materials installed in tension.

CONVENTIONAL VS. TENSILE CONSTRUCTION

There are some basic differences between conventional and tensile construction. In conventional post-and-beam construction, weight and rigidity is a requirement, as these materials are placed in compression to create structural integrity. Vertically aligned posts work in compression with horizontally aligned beams to create structure. However, with tensile construction, lightweight, flexible and elastic materials are preferred, and structural form and integrity is created by adding tension, thereby reducing reliance on compressive members.

Using conventional construction, it is difficult to span great distances without providing support columns to accommodate the suspended loads. However, with tensile construction, spanning great horizontal distances is easy, as weight is almost negligible, especially compared to conventional construction materials and methods.

Take for example the world-famous Sydney Opera House. Built in 1973 with conventional construction using a concrete frame and a precast concrete ribbed roof, the creation of the anticlastic form was both material and labor intensive. However, with tensile construction, biaxial forms can be readily achieved as they flow naturally from the materials installed in tension.

Finally, conventional construction relies on conventional building materials such as wood, stone, glass and metal. However, with the advent of tensile construction, wide use of a fifth building material—membrane—is possible.

An attractive feature of tensioned fabric structures is their enormous range of spanning capability.

Denver International Airport's tensioned fabric membrane roof pays homage to the region's iconic Rocky Mountains.

BENEFITS OF TENSILE ARCHITECTURE

Denver International Airport provides an excellent example of tensile architecture's freedom of form. The structure's visually striking tensioned fabric membrane roof pays homage to the region's iconic Rocky Mountains. This effect would be very difficult and expensive to achieve with traditional roofing materials. In total, the roof required 375,000 square feet of membrane to cover the 900 foot-long terminal building. The main terminal encloses 1.5 million square feet.

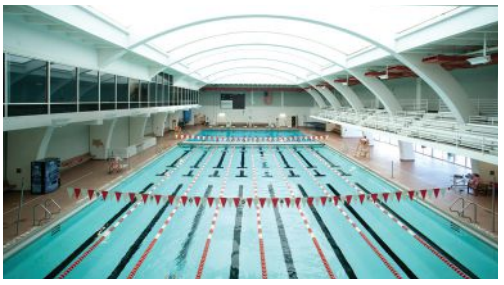
In Greenwich England, the O_2 is another well-known tensile structure. With the project's given budget and schedule, the O_2 could not have been built using conventional roofing methods and materials. Instead, the tensile structure approach resulted in huge reductions in building materials, labor, energy consumption and schedule requirements, making it possible. Amazingly, the entire roof structure, made of PTFE fiberglass membrane, weighs less than the air contained within the building. Today, it remains the largest cable-supported domed structure in the world.

The O_2, in Greenwich England, is the largest cable-supported domed structure in the world.

The use of translucent membrane frequently invites a conversation about daylighting. With conventional daylighting systems, such as skylights or glass curtainwall, glare and solar heat gain become problematic. Glare from harsh natural light causes visual discomfort, strain and eye fatigue. But membrane provides abundant amounts of diffused daylight—what has been referred to as museum-quality light. The translucency of membranes can range from 9 percent to 40 percent, allowing flexibility in lighting design by controlling the amount of light that can pass through the roof.

Owing to membrane's light weight and strength, it spans long distances far more efficiently and economically than conventional roofing structure and cladding systems. Conventional roofing products are generally limited to smaller panel sizes around 20 feet or less. The more panels required, the more joints are required creating a greater opportunity for failure. By contrast, the nominal maximum span for tensioned membrane from the factory is up to 40 feet in width and 300 feet in length. Widths up to 40 feet are achieved by fusing membrane panels with a heat weld. This seam becomes completely weather-tight and as strong as the membrane itself. However, it should be noted that there may be logistical and installation limitations that can dictate maximum panel dimensions.

More recent technological advancements now allow for membrane to provide translucency and insulating capabilities, as shown here over a natatorium at Radford University in Radford, Virginia, installed in 2009. This remarkable advancement will be discussed in more detail a bit later.



The Donald D. Dedmond Center Natatorium, Radford University, Radford, VA is an example of how advancements to the membrane to can provide translucency and insulating capabilities.

The numerous and unique benefits of tensile architecture are well summarized by British architect Sir Michael Hopkins. He wrote, "Increasingly we are exploring highly-efficient multi-functional elements, where structural performance, enclosure, light and thermal transmittance are combined in a single element. These are the reasons we use membrane."

PROCESS OF TENSILE STRUCTURE CREATION

Again, a key benefit of tensile architecture is the ability to achieve dynamic forms. Examples of standard roof forms that tensile designers work with include barrel vault, cone, crossed arch, dome, flat, flying mast, folded plate, hypar and sail. However, designers are not limited by these; entirely unique forms can also be designed, engineered and built to perform safely.

Two sail-shaped PTFE membrane canopies create a dramatic and signature look at the entrance of the Hornblower Niagara Cruises.

Attachment details for membrane to rigid structural and/or cable elements are designed specifically for a given project. There are a variety of standard connection details used in membrane structures, but design-build contractors who specialize in tensile structures work with architects to provide details best suited for specific project conditions. These details are often included in the construction documents, or, more frequently, in the design-build specifications included for the specialty contractor.

More often than not, tensile architecture requires a design strategy involving the interaction of a wide variety of geometric forms, materials and tensioning options. Design involves sophisticated engineering programs to help architects and engineers create nearly any imaginable design. However, it's likely difficult to source the information you'll need from your firm's resource library. Consultation with a design-build contractor who specializes in tensile architecture is an important and extremely valuable step, as successful tensile structures are designed, engineered and constructed in close cooperation with such companies. Architects who work extensively with tensile structures recognize this cooperative effort as a standard of best practices.

Cooperation with a tensile architecture specialty contracting firm with in-house design and fabrication resources minimizes risk for the client, designers, architects and engineers. Using third-party brokerage firms is not recommended and can lead to problems in the construction and performance of the structure.

Tensile structures are generally specified as design-build projects. When designing a tensile structure, the desired geometry and form need to be addressed first. Then, an analysis of how the membrane will interact with the support structure will help determine which membranes and details may be used to meet the load requirements.

The use of special software packages, incorporating finite element analysis, provides detailed output for proposed designs. These software packages are found in-house with the specialty contractor. A third-party engineer can be engaged for analysis services, but first be sure their qualifications and experience with tensile structures is checked.

It should be noted that full design responsibility usually rests with the tensile contractor and is inclusive of both the membrane and structure, which is usually steel and/or cables. Membrane products are purchased in stock lengths and widths. Included in the scope of the tensile contractor's work is the engineering and detailing required to pattern the material to the desired form. During membrane fabrication, stock lengths of membrane are cut to the patterns as designed. Then, the cut patterns are assembled to the desired panel sizes required for installation through heat/pressure welding, radio frequency welding and/or sewing.

Since most tensile contractors provide design-build services, they're also responsible for detailing all elements of the tensile structure. Detailed design drawings of each element of the structure are required to effectively produce fabricated elements for the tensile structure. It's important that the architect clearly understand the process by which the tensile contractor will be handling the design and engineering component of their project.

Tensile structures are generally specified as design-build projects.

The construction phase of tensile systems is also extremely important to the success of a project. Forces applied to the structure during installation need to be analyzed to prevent unbalanced loads and failures. Since the integrity of a tensile structure relies upon elements erected and set in tension, the membrane, steel and cables, and the methods developed to install the system, all require detailed engineering and planning.

As is the case with conventional construction, the project begins to take shape with steel erection. Many of the fabricated steel components will provide a surface to which membrane will be wrapped. This technique allows a designer to depart from the tent-like slope of a suspended roofline and create added visual interest. Steel also provides an integration point for other architectural elements, such as windows and skylights. Then, membrane is installed over the steel structure. Membrane is tensioned to perimeter attachment systems to form a continuous impermeable structure.

Caption: Bundled cable systems are massive and impressive structures themselves and allow efficient means for creating dramatic effects.

Cable systems are frequently used in lieu of rigid structural members. Depending on the required span and geometry, cable-truss systems can be designed using bundled cable

combinations. These precisely engineered systems can be massive and impressive structures themselves. For long span applications, cables and cable net structures present efficient means for creating dramatic effects.

SELECTING A MEMBRANE AND MEMBRANE TESTING

Extensive research and development has led to the creation of several types of membranes and their validation for use on various types of structures. Not all types of membrane are suitable for every project. Design requirements or structural elements may limit membrane selection.

Because membrane materials are essential to the performance and integrity of the finished structure, a material testing regimen is required for each project or design development process. Many of the tests are critical to the life span of the structure and the establishment of a quality assurance/quality control process. These tests should be provided by the specialty contractor through in-house testing resources or third-party facilities approved by internationally recognized tensile organizations.

TYPES OF TESTING

Extensive testing determines the strength and flexibility of tensile membrane. Testing assures that the membrane and selected connections will manage calculated loads and stresses under harsh conditions found during seasonal weather extremes likely to be found on the site. These tests can include breaking strength and elongation of coated fabric, crease fold tensile tests, trapezoidal shear strength, adhesion test, and static load tests. All of these tests are performed to ASTM standards.

A weather machine that produces accelerated weathering effects is used to test the membrane's ability to withstand UV rays in wet and dry conditions. Also, light transmission and reflectance are measured.

This article continues on http://go.hw.net/AR1114Course1. Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. In which type of construction are lightweight, flexible and elastic materials preferred?
   a. Conventional construction
   b. Tensile construction

2. The nominal maximum span for tensioned membrane from the factory is up to _____ feet in width and _____ feet in length.
   a. 10, 500
   b. 40, 300
   c. 5, 100
   d. 75, 200

3. True or False: Full design responsibility usually rests with the tensile contractor and is inclusive of both the membrane and structure.

4. What is typically the underlying structure of a tensile membrane building?
   a. Steel
   b. Wood
   c. Brick

5. Membrane is often tested for which of the following?
   a. Adhesion
   b. Flame resistance
   c. Tensile strength
   d. Light transmission
   e. All of the above

6. Which extremely durable membrane is a Teflon® coating applied to woven fiberglass?
   a. PTFE fiberglass
   b. PVC
   c. ETFE film

7. True or False: Today's most widely specified membranes are PTFE fiberglass.

8. What is the primary benefit of a TiO_2 coating?
   a. Durability
   b. Self-cleaning surface
   c. Fire resistance
   d. Longevity

9. True or False: Most membranes are transparent and therefore allow diffused, glare-free and sufficient sunlight to be transmitted into an interior space.

10. Which of the following is a notable performance characteristic of Aerogel?
    a. Minimizes heat transfer
    b. Reduces sound transmission
    c. Diffuses light
    d. Repels moisture
    e. All of the above

SPONSOR INFORMATION

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UNDERSTANDING THE BENEFITS OF VRF ZONING IN HISTORIC RENOVATIONS AND RETROFITS

Presented by:

MITSUBISHI ELECTRIC
COOLING & HEATING

LEARNING OBJECTIVES

Upon completion of this course the student will be able to:

1. Understand the basic technology of a VRF zoning cooling and heating system
2. List the specific benefits and advantages of a VRF zoning system over traditional HVAC systems in existing commercial buildings
3. Discuss why VRF zoning systems are appropriate for many different types of commercial buildings and are not just for spot cooling and heating
4. Explain how VRF zoning systems can be a strong choice in retrofits and renovations of historic or sensitive commercial buildings

CONTINUING EDUCATION

CREDIT: 1 LU

COURSE NUMBER: ARnov2014.2

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR1114Course2 to read more and complete the quiz for credit.

By: Andrew Hunt

Variable Refrigerant Flow (VRF) zoning technology is a fast growing type of cooling and heating technology currently used in commercial building renovations and retrofits, among other applications. Despite the increase in specifying this highly efficient and unobtrusive system, many architects do not have a complete understanding of the features and benefits a VRF zoning system can deliver to a renovation or retrofit project.

This learning unit will provide a general overview of VRF zoning technology and cover the different types of systems available. This article will inform the architect of specific advantages a ductless Heating, Ventilating, and Air Conditioning (HVAC) system can provide, especially in sensitive or historical commercial building renovations or retrofits.

VRF ZONING BASICS

VRF systems, both ductless and ducted, are cooling and heating systems that provide building professionals an alternative to traditional HVAC systems. Ductless VRF zoning systems are especially beneficial in renovation and retrofit situations. VRF zoning systems can work exceptionally well in buildings that have zones with distinct cooling and heating needs, for example, multi-tenant, mixed-use commercial, health and wellness facilities, and historic buildings—anywhere occupants need individualized temperature control. VRF systems are an appropriate choice when renovating older or historic buildings that either can't physically incorporate traditional HVAC system components (e.g., they don't have the space or pre-existing ductwork), or where such systems interfere with the architectural integrity of the building.

This section covers key elements concerning the basic functions of traditional HVAC systems, including the foundational elements of VRF technology; how and why VRF zoning systems compare to split-ductless systems; how VRF systems can efficiently increase the capacity of already taxed HVAC systems during expansion or renovation; why selecting a manufacturer that has historical integrity and internal training to support systems is important; and, the advantages of a two-pipe system over a three-pipe system.

Traditional HVAC Systems

Most people are familiar with how traditional heating, ventilation and air conditioning

Selecting a manufacturer, engineer, and contractor with the required experience and training to support the system

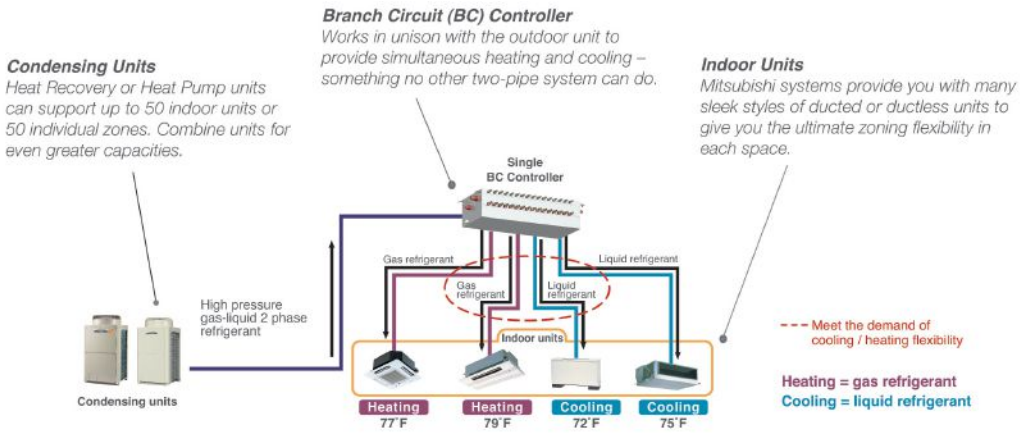
Choosing the appropriate HVAC system for a building—whether it's a new build or a historic preservation project—requires people who know the technology and how it will function in the building. This is particularly true with VRF systems, which are still considered to be "new" in the US. Some things builders and architects can look for when choosing the right system include evidence that:

- The manufacturer has historical integrity with many different types of projects. A manufacturer should provide a substantial portfolio of past projects using VRF technology, including newly built projects that conform to LEED® standards, and challenging historic preservation projects. The projects should identify the energy savings noted after at least a year of use.
- The manufacturer trains all engineers and contractors on system installation and support. Well-trained engineers and contractors are critical to successful projects and building maintenance. A manufacturer should offer ongoing training to keep them up to date with the latest advances in the technology

systems—commonly known as HVAC—operate by circulating air through a building's ductwork after the air has been cooled or heated.

To make the internal environment comfortable for the occupants, the temperature of the air is changed through the use of a heat exchanger. The temperature of the refrigerant is controlled through the properties of fluid dynamics, specifically that when refrigerant expands, it becomes cooler and when it is compressed, it becomes warmer. This phase change from liquid to gas (or gas to liquid) provides the cooling/warming effect. Given the need for this process, all standard HVAC systems share common components: a compressor, a condensing unit, a metering device (expansion valve) and an evaporator. These four components allow the refrigerant to change phases as it expands and contracts, thus becoming hotter or cooler, and in turn changing the temperature of the air that gets circulated throughout the building.

One of the main challenges of traditional HVAC systems is the requirement for ductwork to transport the conditioned air. Most people who have worked in a building with central heating and air conditioning know that temperature can vary from room to room with one office or suite being perfectly comfortable, and the adjacent area being much too hot or cold. These challenges can lead to uncomfortable work environments and an increase in energy



VRF zoning system that can simultaneously heat and cool indoor spaces (Courtesy of Mitsubishi Electric)

costs. These costs become especially prevalent when occupants are forced to constantly adjust thermostats, open windows, or use personal heaters or fans, to create a comfortable working environment.

HVAC systems can also be one of the more challenging and expensive elements to specify and install during building renovations or retro-fits. Traditional HVAC systems are large, noisy, and require extensive ductwork to be integrated into the building design. For some renovation projects, traditional HVAC systems don't work with the building's design or infrastructure, and don't mesh with the sustainable design and LEED® certification needs that are becoming increasingly common.

VRF Zoning Technology

Variable refrigerant flow (VRF) zoning systems offer a ductless or ducted temperature control method that is more energy efficient, flexible, and precise than traditional HVAC systems. The technology has been used in Asia and Europe since the 1980s, but was only introduced to the U.S. market in the mid-2000s. It is rapidly gaining popularity in the United States as building professionals learn about and appreciate its precision, flexibility, and energy efficiency benefits.

VRF can be used in a range of buildings, but is particularly beneficial when renovating older and historic buildings, and for complex commercial spaces that require area-specific temperature control. Examples of properties that can benefit from VRF zoning systems include older hotels designed without air conditioning, smaller historic buildings converted into museums or office spaces, and larger warehouses or factories repurposed as multi-use or multi-tenant properties.

VRF systems have a unique ability to link one condensing unit to multiple indoor units across multiple zones, each of which can be individually controlled by occupants within that zone (e.g., floors or suites). The indoor units add to the modular nature of the technology: they're relatively small and can be easily and discretely installed within individual rooms. If the building is large enough, it may need more than one condensing unit (and thus more indoor units) but the result is the same: more precise temperature control within the building leading to improved occupant comfort and greater energy savings.

The method by which VRF systems and traditional HVAC systems deliver conditioned air is a key difference between the two systems. In traditional HVAC systems, cooling or heating demand is triggered by a change in space temperature, which activates a central system to deliver conditioned air through the building's ductwork. VRF systems, on the other hand, measure the space temperature within each zone, and react by varying the refrigerant flow between the outside condensing and indoor units, allowing for zone-specific cooling and heating. Some systems can simultaneously cool and heat different zones for occupant comfort.

The cornerstone to the energy efficiency improvements afforded by VRF systems is the inverter-driven pressor, which modulates its speed depending on the space temperature requirements. Due to intelligent controls within

each zone, the system quickly reacts to changes in space temperature requirements, such as solar loads or increased zone occupancy. The combination of precise space temperature readings and the efficiency of the inverter-driven compressor lead to overall improved occupant comfort and energy savings.

VRF systems and split-ductless systems

VRF systems are often compared to split-ductless systems because of the operational similarity of delivering cooled or heated air based on the space temperature requirements of a specific zone. A benefit of both system types is the reduced indoor and outdoor unit noise levels when compared to traditional HVAC systems. In addition, VRF systems and split-ductless systems are more energy efficient than traditional HVAC systems due to their zoning capabilities and compressor technology.. By providing desired cooling or heating within the zones that require it, instead of the entire building, including areas that are unoccupied, these systems avoid additional energy costs common with central forced-air systems.

The inverter-driven compressor technology of VRF and split-ductless systems works more efficiently than the compressors commonly found in conventional HVAC systems. The innovative inverter-driven compressor provides energy-saving benefits through the ability to modulate their speed to accommodate the cooling or heating load of the building. The compressor's constant modulation to maintain desired space temperature is much less energy-intensive than the traditional on/off modes of traditional HVAC systems.

Utilizing VRF to supplement existing HVAC systems and in renovation projects without existing HVAC.

In situations where an existing building has an over-taxed HVAC system—and, most likely, an older electrical system—VRF systems can add additional cooling and heating to areas with demand not currently being met. The VRF system can lighten the overall load of the HVAC system that is already in place without adding large, noisy outdoor units or additional ductwork.

One example of how a VRF system can help is in cases where a building with an existing HVAC system is being renovated and repurposed in a way that significantly changes the cooling and heating needs. For example, a factory or warehouse being repurposed as a multi-purpose commercial area may have an existing HVAC system that can handle some of the load, but not the specific needs of the occupants in the newly designed space. In this case, a builder can install modular VRF systems to address the needs of the new zones that require more controlled cooling and heating, rather than stretching the needs of an older system.

Renovation projects where the existing building never had an HVAC system—thus no ductwork—are another ideal application for VRF systems. Older and historic buildings are perfect examples of this situation: basements may be too small to safely (or even physically) house furnaces, and the roof may not be structurally sound enough to support heavy HVAC condensing units. Moreover, the space for adding ductwork within the building envelope may be non-existent. In such cases, a system of lightweight, compact outdoor condensing units and space-efficient indoor units can be installed as needed, all while preserving an architecturally sensitive building.

Two-pipe versus three-pipe systems

VRF zoning systems are typically found in a two-pipe or three-pipe configuration. In the two-pipe configuration, an indoor unit called the BC Controller utilizes liquid/gas separator technology to deliver simultaneous cooling and heating through two pipes directly to the space. There is no need for a third pipe, which is in place for the oil return cycle and commonly used by many VRF manufacturers, due to advances in technology made by the only two-pipe manufacturer in the US market.

Two-pipe VRF zoning systems have several benefits over three-pipe systems, primarily in terms of installation, lifetime maintenance, and energy recovery.

First, fewer pipes mean fewer connections and joints than with a three-pipe system. Each connection point comes with additional cost for material and labor, and each of those joints represents a potential failure or leak point. Fewer joints means easier servicing, leading to a lower lifecycle cost. As an example, the difference between a two-pipe VRF system that has eight indoor units and a three-pipe system of the same size would be 36 connection joints compared to 44: in this case, fewer is better.

Three-pipe systems also require regular oil recovery cycles, whereas two-pipe systems do not. The lower refrigerant volumes and velocities during mode change over minimize the need for oil recovery. As a result, there is no zone-temperature drift during recovery cycles, improving energy efficiency as well as control accuracy over the system.

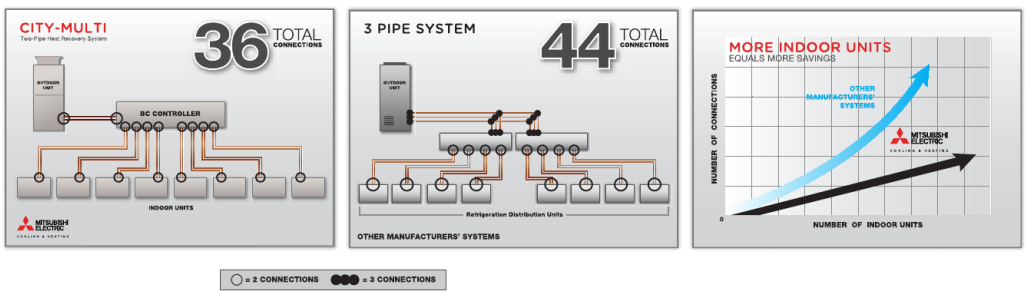
Finally, the two-pipe VRF zoning system has fewer electrical termination points than their three-pipe equivalents. As a result, the wiring process is much less complex, making it easier to diagnose problems, and lowers the time and material costs during installation.

TRADITIONAL HVAC SYSTEMS COMPARED TO VRF TECHNOLOGY

For the right building projects, VRF systems have significant advantages over traditional HVAC systems, specifically physical specifications, such as size, weight, piping, and connections, as well as general intrusion within the building in terms of noise. This section also discusses some of the basic environmental considerations such as LEED® credits and energy savings.

VRF systems compared with traditional HVAC systems: What are the differences?

Most architects and contractors are well aware of the size and energy usage characteristics of traditional HVAC systems, such as overall



Example of connections for two-pipe vs. three-pipe systems, and related savings. (Courtesy of Mitsubishi Electric.)

weight, unit and pipe size, installation options, and noise output levels. When compared with traditional HVAC systems, the VRF systems tend to win out in terms of installation, maintenance, energy efficiency—and thus, in the long term, lifecycle cost.

Weight: Standard manufacturer data cites VRF systems as being 31% lighter than water-cooled chillers. This lighter weight is good news for older buildings that may not be structurally robust enough to handle the weight of a traditional HVAC system, and which might have otherwise required additional structural support—an additional cost.

Unit and piping size: Traditional HVAC units are usually large and located with a mechanical room, and require ductwork within the building; consequently, the placement of these systems is often limited by space requirements. A VRF system, on the other hand, connects the external and internal units with smaller refrigerant pipes, which often means there's more useable space—usually from saved ceiling space—and this means more flexibility in ceiling height requirements.

Visit http://go.hw.net/AR1114Course2 to read more and complete the quiz for credit.

SPONSOR INFORMATION

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Mitsubishi Electric Cooling & Heating, a division of Mitsubishi Electric & Electronics USA, Inc., provides an award-winning line of variable refrigerant flow (VRF) zoning and mini/multi-split zoning cooling and heating systems for commercial and residential applications, along with technical support and training to contractors, engineers, architects and distributors. The latest innovations in comfort technology and energy efficient HVAC products are provided by Mitsubishi Electric Cooling & Heating.

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QUIZ

1. What kind of buildings can Variable Refrigerant Flow (VRF) systems be used in?
   a. Commercial, mixed used and multi-tenant buildings
   b. Historic preservations projects
   c. Multi-residence buildings
   d. All of the above

2. What happens to refrigerant when it is compressed?
   a. Nothing
   b. It gets smaller
   c. It gets warmer
   d. It gets colder

3. What is one challenge of traditional HVAC systems?
   a. They require expensive piping to transport refrigerants between the compressor and the air ducts
   b. Their compressors are so quiet that occupants don't know whether the system is on or off
   c. They require ductwork to transport conditioned air, so the temperature can be difficult to control throughout the building.
   d. They use individual evaporators which require frequent maintenance

4. What is *not* a benefit of Variable Refrigerant Flow (VRF) systems?
   a. They can deliver precise temperature control to specific building zones
   b. They can be individually controlled
   c. They are very noisy
   d. They are modular and easy to install

5. Why aren't Variable Refrigerant Flow (VRF) systems more commonly used in the United States?
   a. Building professionals know they are much more expensive than traditional HVAC systems
   b. They are highly energy inefficient compared to traditional HVAC systems
   c. VRF zoning systems are complicated and difficult to install
   d. VRF systems have only been available in the US for about ten years, and building professionals are only just beginning to learn about and appreciate the technology's precision, flexibility, and energy efficient benefits.

6. How are VRF systems and split-ductless systems similar?
   a. They are both noisy systems
   b. They both use inverter-driven compressors to slowly increase to the desired temperature and then modulate from that point
   c. They are both energy-intensive and expensive
   d. They both heat and cool the entire building

7. How can VRF help buildings with existing, over-taxed HVAC systems?
   a. They can piggy-back on the existing HVAC system to add additional thermal comfort
   b. They can provide modular, zone-specific temperature control via piping, rather than increasing the load on the existing HVAC and electrical system
   c. They can tie-in to the existing HVAC ductwork to deliver additional hot or cool air
   d. They can help heat the entire building all at once.

8. What is one benefit of a two-pipe over a three-pipe VRF system?
   a. Two-pipe systems have dedicated pipes for delivering hot gas for heating and cold liquid for cooling
   b. Two-pipe systems require regular oil recovery cycles, which means they get inspected more often
   c. The two-pipe-system has a fewer electrical termination points, and thus has a less complex wiring process, which means lower installation costs and time
   d. The two pipe system has more connection joints than a three-pipe system, and thus offers a system of redundancy

9. What are some differences between newer VRF systems and traditional HVAC systems?
   a. Newer systems are lighter, smaller, quieter, and more energy-efficient than traditional systems
   b. Newer systems are lighter, larger, and noisier than traditional systems
   c. Newer systems are harder to install and maintain, and they are more energy intensive
   d. Newer systems are bulky, energy-intensive, and less flexible than older systems.

10. What is one advantage of using a VRF systems in historic building preservation?
    a. The systems can plug in to the existing ductwork, and so installation time is quick
    b. The compressors can easily run off of the old electrical system, so there's no need to add additional energy sources
    c. The indoor units are small can be easily installed without much disruption, and they can be hidden to help maintain the architectural integrity of the space
    d. They evenly control the temperature of the entire building

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CENTER

The renovation of the Eiffel Tower's first floor includes a glass skywalk along the inside perimeter, a feature that has become a crowd favorite.

MICHEL DENANCÉ

HISTORIC RENOVATION

TOWERING EXPECTATIONS

TO RELIEVE THE LONG QUEUES TO THE EIFFEL TOWER'S PINNACLE, PARIS ARCHITECTURE STUDIO MOATTI-RIVIÈRE RENOVATED THE LANDMARK'S FIRST FLOOR TO ENCOURAGE VISITORS TO LINGER. WHAT FIRST FLOOR, YOU ASK?

The first-floor renovation includes the demolition and rebuilding of the Pavillon Ferrié (center) and a new exterior for the Pavillon 58 Tour Eiffel (right), whose interior was updated by French designer Patrick Jouin in 2009.

Text by **Andrew Ayers**
Photos by **Michel Denancé**

IN HIS CELEBRATED 1964 essay on the Eiffel Tower, the French philosopher and literary theorist Roland Barthes wrote that the 986-foot-tall landmark is "present to the entire world ... as a universal symbol of Paris ... the major sign of a people and of a place." Yet what people might not know is that this "empty monument," as Barthes called it, in fact hosts several ancillary structures.

Along with the panoramic restaurant on the second level are three substantial buildings and four elevator shelters on the 54,000-square-foot first level, set within the flare of the tower's piers. It is these that the City of Paris (the tower's owner) and the Sociéte d'Exploitation de la Tour Eiffel (SETE, its operator) now hope to bring to the public's attention thanks to a five-year, €30 million ($38 million) makeover by local architecture firm Moatti-Rivière.

This is the first significant renovation of the tower's lowest floor in more than 30 years. In 1981, when the structures were last replaced, the tower received around 3.4 million visitors a year. Today, that figure has doubled, to the point of saturation: A four-hour wait to ascend is common. Since elevator capacity cannot be augmented, the only way for SETE to increase profits is to encourage visitors to spend more time and dollars on the underfrequented first level.

Of the three 1980s structures, two have been demolished and replaced: the Pavillon Eiffel, which houses an event space, and the Pavillon Ferrié, which contains retail and cafeteria space. The third, the Pavillon 58 Tour Eiffel, which hosts a recently refurbished brasserie, has been renovated externally. The

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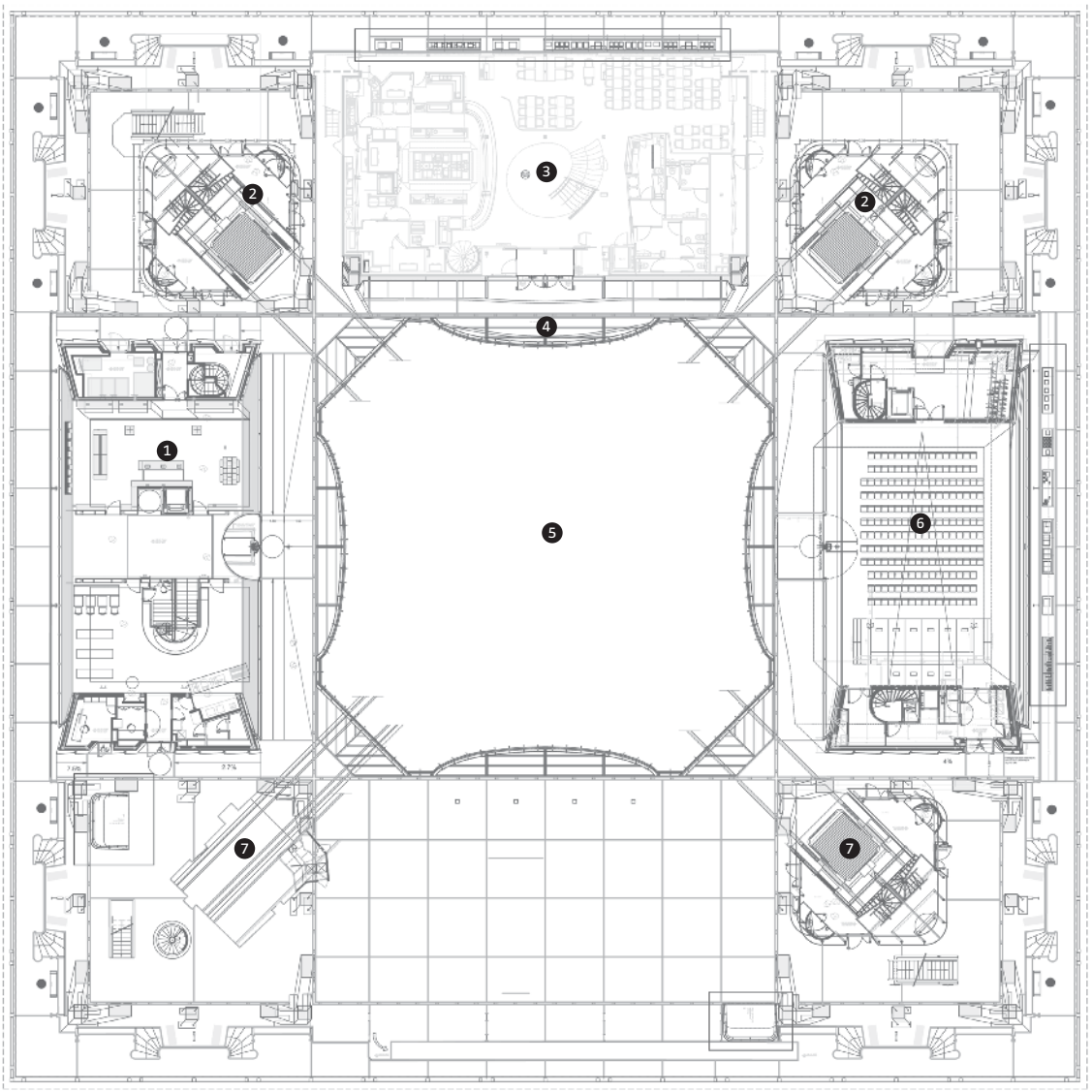
First-Floor Plan



north and west elevator shelters, where visitors change cabs, have also been rebuilt.

The RFP asked competing teams to address the issue of how they would actually build their schemes in the particular conditions of the Eiffel Tower, which SETE intended to keep open throughout the two-year construction period. While others turned to cumbersome cranes, Moatti-Rivière and contractor Bateg proposed an extremely elegant solution comprising four slender stanchions set within the first level's 85-foot-square central void, on which a platform could rise the 187 feet from grade.

Moatti-Rivière's most effective salvo capitalizes on precisely this void. The first level's floor plate features some rather baroque curves around its interior perimeter, which has been entirely rebuilt by the architects in glass. A transparent skywalk now projects up to 6 feet into the void, edged by inclined glass safety barriers. "I wanted to offer each visitor an aerial glissade, the possibility of experiencing the central void," principal Alain Moatti says. "It's as though you're on a volcano, at the edge of the crater, walking around the danger—but, of course, without falling in!"

Where the new pavilions and elevator shelters are concerned, Moatti and his team wanted to maximize transparency while taking formal cues from the tower itself. "The Eiffel Tower's strength and dynamism are embodied in its oblique piers," he says. Unlike their orthogonal predecessors, the new structures follow this obliquity, uniting his firm's interventions: "The diagonal of the pavilions and the safety barriers all push towards the central void."

Mirroring each other on the northeast and southwest sides of the void, the new Eiffel and Ferrié pavilions are in steel, with glazed curtainwall façades on their principal elevations. With its impressive view eastward toward central Paris, the Pavillon Eiffel has been treated as a single-volume event space which, thanks to its glazing, virtually disappears when seen

SUCCESS STORY:
THE HOTEL WILSHIRE, LOS ANGELES

In 2011, in the heart of Los Angeles' Miracle Mile, something truly amazing was born. Amidst the densely populated streets of Hollywood and Beverly Hills stood a relic. An old 1950s medical building destined to be turned into a pile of rubble. What happened next was nothing short of magical.

When real estate developers Michael Orwitz, Spence Mitchum and Justin Khorvash went looking for a location to create their Four Diamond boutique hotel, The Hotel Wilshire, even they couldn't have imagined the hidden gem they would find in this dilapidated six-story medical building. But, after assembling some of the best professionals in the hospitality business, it was clear that their endeavor was about to become a reality.

After finding a design team that shared their views on the importance of sustainability, they set their sights on making The Hotel Wilshire LEED Silver Certified. Which meant air quality, as well as occupant comfort, would be important factors.

Enter Mitsubishi Electric's VRF zoning systems. Mitchum had experience using the VRF zoning system with a previous boutique hotel. He knew the system's flexibility, performance and efficiency would play an important role in obtaining LEED certification for this 74-room boutique hotel.

The Mitsubishi Electric VRF zoning system proved to be a perfect fit. Twelve months after its opening, The Hotel Wilshire boasted a LEED Silver certification, 17 percent less energy use, and one of the best views in L.A. from its chic rooftop pool. Just the type of epic performance you'd expect from a star in the hospitality industry.

PROJECT SUMMARY

Dilapidated six-story building remodel:

- 55 Guest Rooms
- 19 Suites
- 1 Rooftop Penthouse Suite
- 1 Rooftop Pool Deck w/ 500 Sq Ft Patio

Equipment Installed:

- 4 PLFY Ceiling-recessed Indoor Units
- 47 PMFY Ceiling-recessed Cassette Indoor Units
- 39 PEFY Ceiling-concealed Indoor Units
- 7 PURY R2-Series Outdoor Units
- 7 Branch Circuit (BC) Controllers
- 90 PAC Simple MA Remote Controllers
- 2 AG-150A Centralized Controllers

Results:

- LEED Silver Certification. 17 percent less energy consumption. 19 percent cost savings. Four Diamond Ranking by AAA.

Get more details about The Hotel Wilshire and see how Mitsubishi Electric solved other HVAC design challenges at **MitsubishiPro.com.**

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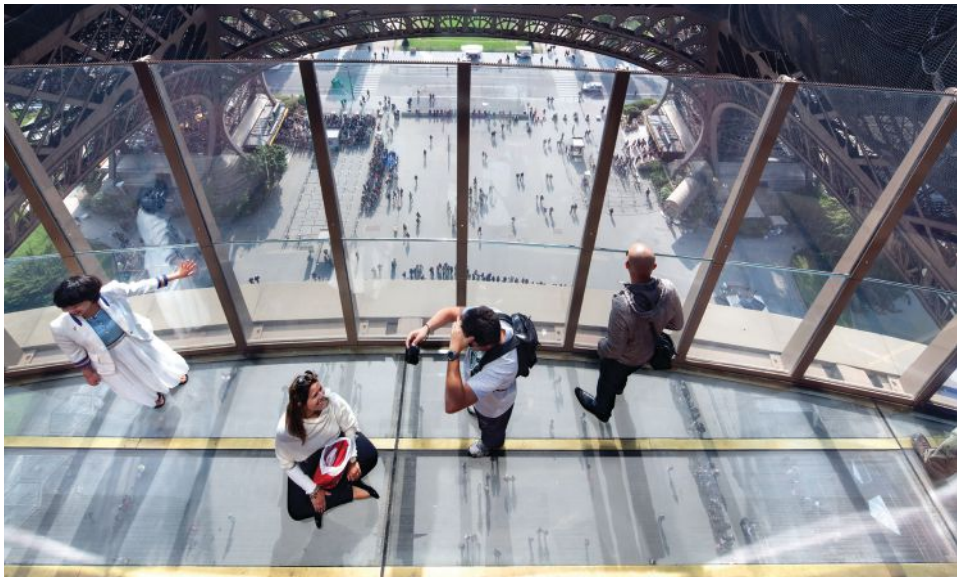
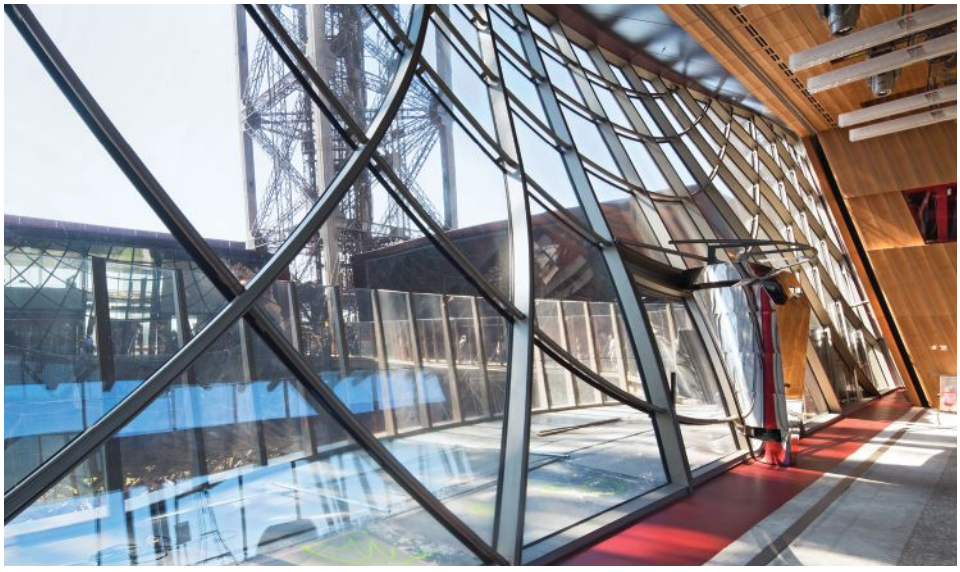




Top: Of all the first floor's new features, the glass skywalk on the interior perimeter seems to delight visitors the most.
Bottom: The pavilions' curtainwalls transition from curvilinear at the roofline to rectilinear at the floor.

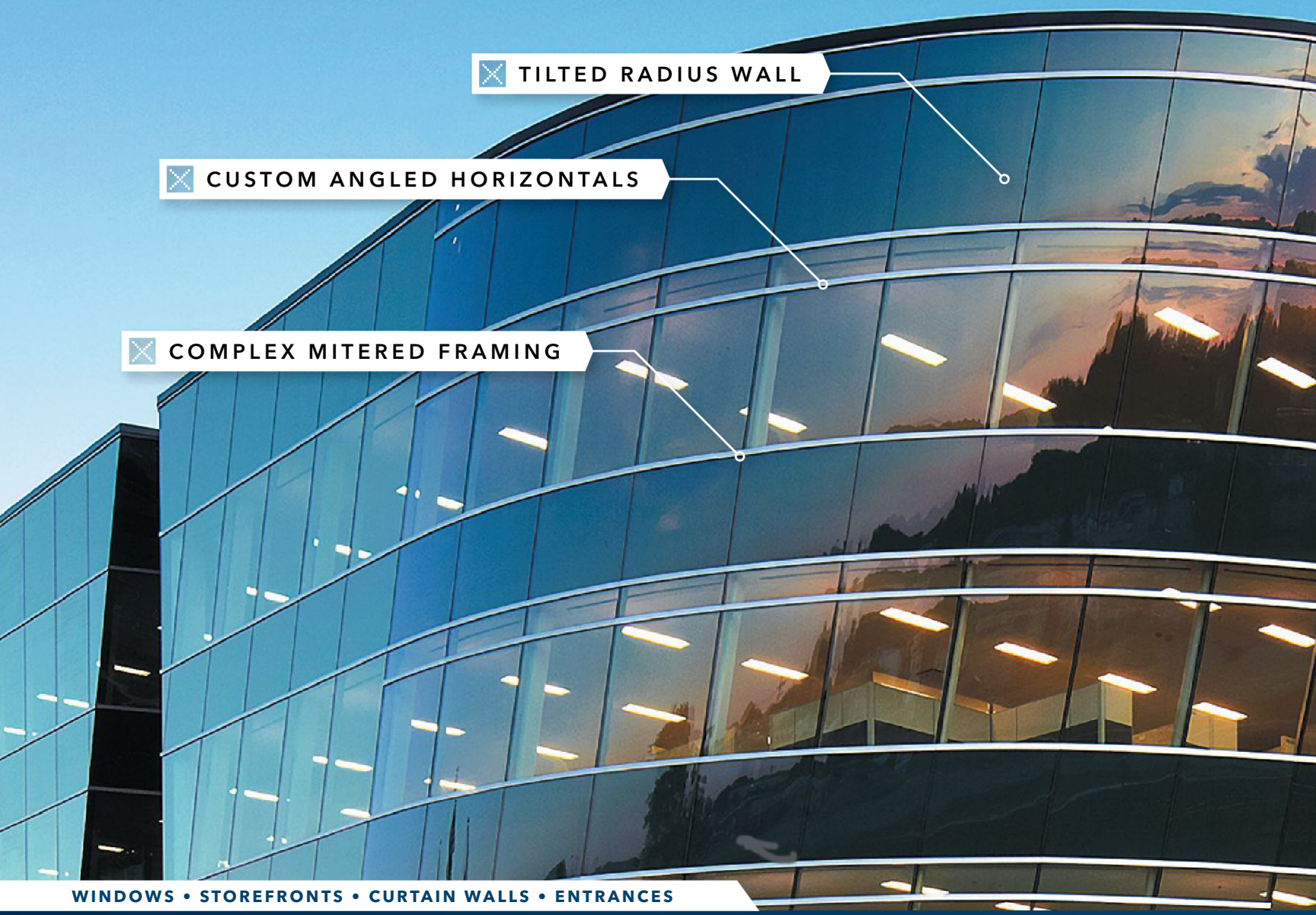
from across the void. Divided into two stories, the Pavillon Ferrié contains a shop, cafeteria, audiovisual space, and restrooms. Here it is the views out, not through, that count, with even the washbasins being set in front of dramatic vistas.

In addition to the obliquity, contextual complexity has been increased by having the roof of each pavilion follow the void-side curves of the first-level floor plate. Their floor plans, however, remain simple rectangles, resulting in splendidly convoluted façades that only our computer age could realize.

And only our era would impose the constraints under which Moatti-Rivière and Bateg had to work. The Eiffel Tower is protected as a historic monument, meaning no welding or drilling, so the team had to devise a system of clips to hold the new structures in place. (The glass floors were allowed only because the tower's original flooring had been replaced in a previous refurbishment.) The revamped elevator shelters, too, are squeezed into the tower's piers to within an inch of their lives, taking on splendidly constructivist forms that Moatti-Rivière clearly enjoyed playing with.

Indeed, building and engineering the new structures was quite a heroic enterprise. Torsion beams were needed to transfer dead and wind loads from the glazed façades to the tower's structure with minimal contact. To avoid any risk of destabilization, the new pavilions could not be heavier than their 330-ton predecessors,

YEAH, WE DO THAT.



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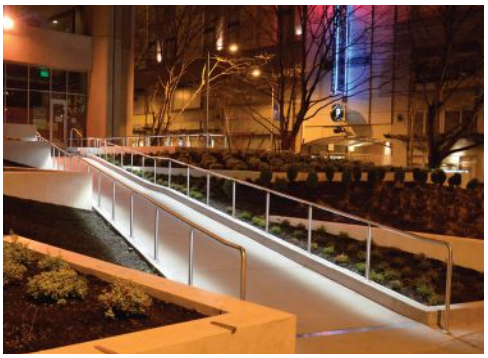
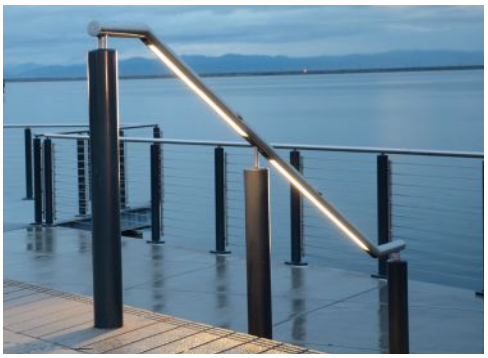


United Consulting
Big Four Bridge



The Eiffel Tower is painted in dull beige, but the new pavilion structures on its first floor are finished in striking-red automotive paint. When viewed from the street level, however, the glossy additions are more subtle, thanks to the glazed curtainwall façades on their principal elevations.

so the team used weighing machines to monitor material coming off and going on the tower during construction.

One of the riches of the project is the detailing—although, as the French saying goes, there are *détails qui tuent*. The tower is painted in dull, dark beige, but the new structures are flawlessly finished in striking-red automotive paint. The architects claim this was the tower's original color, since it sported a coat of minium anti-rust paint in 1889, but the result appears far too glossy and cherry. But then shininess and reflection, often to the point of tinselly glitz, are just as much a part of Moatti-Rivière's arsenal as self-effacement. This is particularly evident inside the Pavillon Ferrié, where highly reflective surfaces, including mirrored ceilings and glossy black walls sporting photos of historic Eiffel Tower tourist tat, abound. The elevator shelters too, so transparent from within, become Jeff Koons–esque shiny baubles when seen from without.

Elsewhere, the detailing is more subtle. Punched-metal benches echo the tower's latticework, information displays mimic Paris' riverside bookstalls, the Pavillon Eiffel's pulleys recall the tower's elevator wheels, and the custom Eiffel chairs elegantly evoke their reticulated muse. "Everything here was a prototype, everything was bespoke," Moatti says. "The Eiffel chairs were practically handmade, cast in aluminum in a mold that was built by hand."

But handsome details don't necessarily add up to more than the sum of their parts, and the renovation uneasily rides the line between the sober and the spectacular. "You first have to look at [the tower] closely and then forget it in order to design your project; otherwise, you'll be crushed by the weight of history," Moatti says. But one wonders if he wasn't nonetheless a little cowed by the responsibility—or by his client—for the project appears contradictory. What ought to be an ebullient funfair attraction is squeezed into a suave straitjacket of chic—this party guest desperately wants to be daring, yet dare not upstage its host.

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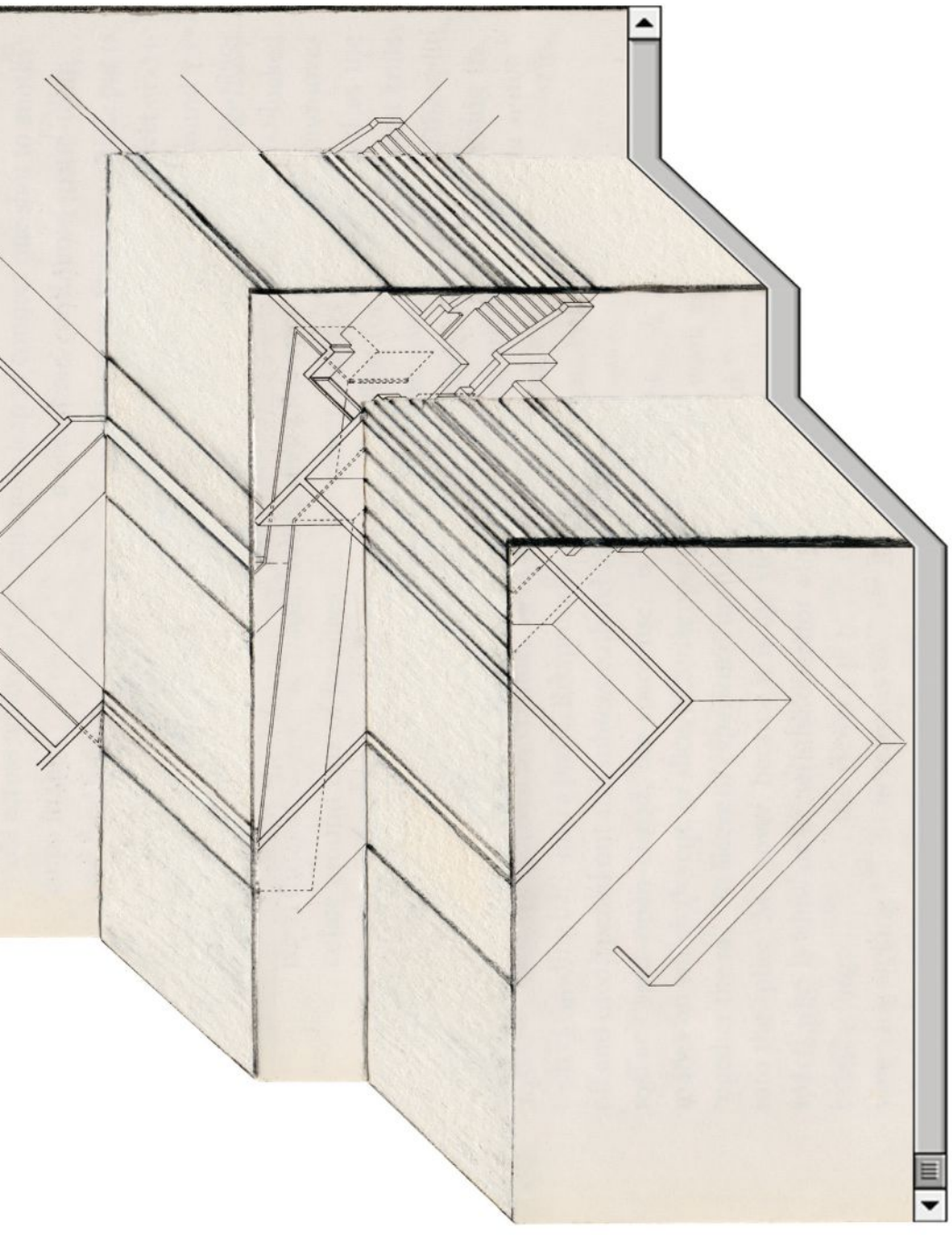
BEST PRACTICES

REVAMP YOUR WEBSITE

ARCHITECTS' SITES ALL TEND TO SUFFER FROM THE SAME SET OF PROBLEMS. HERE'S A GUIDE TO AVOIDING THOSE MISTAKES AND ENSURING THAT YOUR FIRM PUTS ITS BEST FACE FORWARD ONLINE.



Text by **Amanda Kolson Hurley**
Illustration by **Joe Rudko**

SQUINTING TO READ tiny white words set on a black background? Not knowing whether to click or to scroll? Do these problems sound familiar? Your website is the face that most of the world will see—even more than your latest building or monograph—so get it right by following a few simple rules:

Don't Do Flash: It's easy to see the appeal of Flash animation as a dynamic splash page to introduce your practice. Resist the temptation. Your content will be invisible to search engines and impossible to view on mobile devices.

Think beyond the portfolio: Architects often create digital monographs—heroic project images front and center, with descriptions and design philosophy at the margins. But more firms are chafing at the restrictions of the "grand showcase," as NBBJ communications director Helen Dimoff, Assoc. AIA, calls it. Seattle-based NBBJ redesigned its site in 2013. "When we looked at the industry's way of communicating through company websites, it was all the same," Dimoff said of the competitor audit the firm conducted. NBBJ reviewed numerous concepts with interactive design studio Method before taking the site in an editorial direction. Today NBBJ's homepage will point you to a blog post or an interview with its architects.

Find the right balance between text and images: NBBJ's headlines are the giveaway—the site relies on text, from an "ideas" channel to a design blog spinoff, nbbX. On pages where images have pride of place, users don't have to click through for accompanying text. "We didn't want to hide the narrative," Dimoff says. The photos are enlivened by people using the spaces that NBBJ designed. Method principal David Lipkin advises against stark building-as-object shots: "Warm it up, don't make it so cold. Not everything has to be cold and modern."

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HELEN DIMOFF, ASSOC. AIA
COMMUNICATIONS DIRECTOR, NBBJ

WIL CARSON
CREATIVE DIRECTOR, 180WEST

A text-rich site is not for all, of course. For Julie Eizenberg, AIA, principal of Santa Monica, Calif.–based Koning Eizenberg Architecture, less text is better, and the act of distilling it can lead productive discussions. "The language [on the site] is deliberately straightforward," she says. "We wanted to use it as an opportunity to think about what the hell we were doing" as a firm.

The firm's site follows the latest trends in Web design: images in horizontal ribbons and parallax scrolling, which creates the impression of a background and faster-moving foreground. Stacked full-width images feel less busy than smaller tiles, while foregrounding the text ensures it won't get lost. "There's a certain playfulness, flexibility, and populism within the firm itself," which carries over to the site, says Wil Carson, creative director of graphic design studio 180West that designed the Koning Eizenberg site.

Responsive design is important, but not necessary: Responsive design optimizes viewing on mobile devices, tablets, and desktops. It's important: Mobile devices now account for more than 20 percent of all Web browsing. But going fully responsive is expensive and unnecessary for most architects. "A lot of the mobile use of a corporate website is someone going to a job interview or meeting [and finding] the address or phone number," says Method's client services lead Carolyn Weiss. Essential information should be prominent and viewable on a phone.

Have fun: For a profession that prides itself on creativity, architects are stuck in groupthink when it comes to websites. But one Parisian firm truly sets the bar for originality: The site of Freaks Freearchitects opens with a clip of the Power Rangers with partners' names added in. It probably goes against all advice a Web designer would give (it uses Flash, for one thing)—but it's great. Firm partner Guillaume Aubry says a cheeky site filters all but potential collaborators. "We maybe get less phone calls than others, but those phone calls more often end up with a real exciting project. Our ratio is quite good."

PETER ARKLE


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NEXT PROGRESSIVES

BLENDING DISCIPLINES

A HEALTHY DOSE OF CROSS-POLLINATION BETWEEN INDUSTRIAL DESIGN AND ARCHITECTURE ALLOWS KANSAS CITY–BASED KEM STUDIO TO FOCUS ON THE DETAILS.

KEM Studio co-founders (from left to right) Jonathon Kemnitzer, Brad Satterwhite, and Jon Taylor in their Kansas City, Mo., office.

Introduction by **Alex Hoyt**
Photo by **Chris Mullins**

NEARING ITS 10TH ANNIVERSARY, Kansas City, Mo.–based KEM Studio has created a signature fusion of architectural and industrial design, with a portfolio that includes children's microscopes; kayaking helmets; a Kickstarter-funded, Eames-inspired frame that turns a skateboard into a bench; a playground of trapezoidal bridges fashioned from salvaged decking; a modern renovation of a '60s duplex that is on the National Register of Historic Places; and a taxicab-dispatch-turned-startup-office. How are all of these connected? Founding principal Brad Satterwhite, Assoc. AIA, explains the core values that he and his fellow founders—architect Jon Taylor, AIA, and industrial designer Jonathon Kemnitzer—use to develop their disparate projects: A holistic approach to design, an immense amount of research, and a tireless pursuit of the "big idea."

Beginnings: We started out in 2004, each coming from separate firms. Kemnitzer was working with his father, and Taylor and I were

An interior hallway of the State Farm Dallas HUB / CityLine Project in Richardson, Texas. The 1.5 million square foot project includes residential, retail and hospitality components, and is scheduled to be finished in May 2015.

UPSCALE DESIGN

"We chose VT Architectural Wood Doors mainly for their aesthetic. The warm wood veneer adds to the interior environment. The wood veneer species chosen for the State Farm project very much involved the owner, tenant, and interior designer."

Liz Wilson, Registered Interior Designer
Associate
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working at local firms. Jon was also the chairman of the AIA Young Architects Forum, bringing in lecturers for a series called "Design is Design," which aimed to increase the dialogue about design in Kansas City. We're unique in that we brought together educated architects and industrial designers into one firm where we work across disciplines. We approach every project not as industrial designers or architects, but simply as designers.

Due diligence: All of our work is heavily influenced by our research process. At the outset of each project, we establish what we call the "big idea" for the job. We're focusing on the context, the constraints, the user, the manufacturing, and the way these pieces will fit together. It's all about establishing a mentality for innovative design before a single line is drawn. We come to understand our clients' life- and work-styles. We're user- and human-focused, and we merge the qualitative and quantitative. Otherwise, you get into preconceptions that constrain the design.

Incorporating the visual arts: One of our clients, a Kansas City dentist, inherited an office that didn't represent him at all. He has a modern approach to life and an appreciation for the arts. Redesigning his office, now KC Dental Works, was an opportunity to share that with his clientele. We also wanted to change the experience of a dentist's office—we wanted it to be spa-like, a place you want to return to.

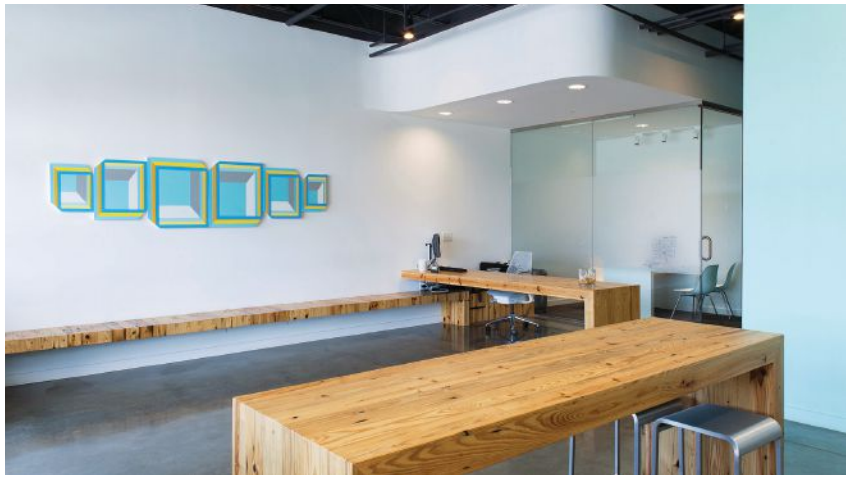
For an art installation, we suggested several artists whose sensibility and approach we thought would be a good fit. He chose local painter Archie Scott Gobber, who created an installation of abstract pieces that forms a smile, and which plays off of our design's scale and color palette.

For the office's benches, reception desk, and shelves, we brought in a local sculptor, Peter Warren. We had designed elements of the interior, but we hadn't yet done the fine details—how a top meets a side, how the joints come together. He saw the real possibilities of the material, and we had a lot of trust and respect for his sensibilities.

Finally, to redesign his brand, our client brought in a local graphic design firm, Design Ranch. We were able to work together on everything from the color scheme, to the graphics, to the branding, so it was all part of a holistic message.

Synergy: We're highly collaborative in our critical thinking. Working in these different scales—architects working on industrial design and vice versa—makes us better at our respective disciplines. We do commercial furniture, and we're working on a project with Herman Miller to make landscape forms. As industrial designers, we have more of an appreciation for the space that our pieces go in, because we're designing that, too. On the other hand, when we're designing a house, we have a greater appreciation for the interaction between a space and its consumer products. On some industrial design projects we're dealing in 1/16-inch radii, and we've learned that those details are just as important as, say, a handrail connection on an architecture project. It's broadened our sense of architectural scale, and it's made us better designers.

MIKE SINCLAIR



Opposite: The Madison Residence, in Kansas City's Westside, won a 2013 AIA|KC Honor Award.
This page: The Académie Lafayette Playground (top) was designed to be built on a limited budget and by volunteers; custom furnishing and artwork define the renovated offices of KC Dental Works (left); KEM Studio enhanced the existing Town of Kansas Bridge with benches and bike racks (below left); and Skate Bench No. 1 blends midcentury minimalism and street culture (below right).

TOP AND MIDDLE: AHRAM PARK; BOTTOM LEFT: MIKE SINCLAIR; BOTTOM RIGHT: RON BERG

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Text by **Ali Morris**
Photos by **April Greer**

1. SPIRIT LEVELS, TREVOR DUNCAN

For: Engineers and contractors Picked by: Fauzia Khanani, principal, Fōz Design These pocket-sized levels by British designer Trevor Duncan are "a good reminder that functional things can also be beautiful," Khanani says. Machined into smooth barrel and bull's-eye shapes, the aluminum, brass, and Corian levels have a reassuring heftiness. *Prices start at $175; toolsforeverydaylife.com*

2. DESIGN THINKING, PETER G. ROWE

For: Clients Picked by: Aaron Wong, AIA, principal, IA Interior Architects "It would be interesting if we could open our brains for [our clients] to gain a better understanding of how we architects think," Wong says. Hand out this acclaimed 1991 book by the Harvard University Graduate School of Design professor that explores how creatives solve problems. "I do hope that [the recipient] will give me a book on how clients think," Wong adds. *$32 (paperback); mitpress.mit.edu*

3. SOLID TYPEFACE ALPHABET STAMPS, FLORES TANIS SUPPLIES

For: Clients Picked by: Griz Dwight, AIA, principal and owner, Grizform Design Architects
Take monogrammed gifting to a new level with this set of ¼"-square alphabet stamps that can personalize leather-bound sketchbooks, wallets, briefcases, and more. "The only bit of warning with these is to keep them away from kids or they will write their names at their seats in the breakfast table," Dwight says. "Seriously, they will." *$20; etsy.com*

4. MUG, BDDW

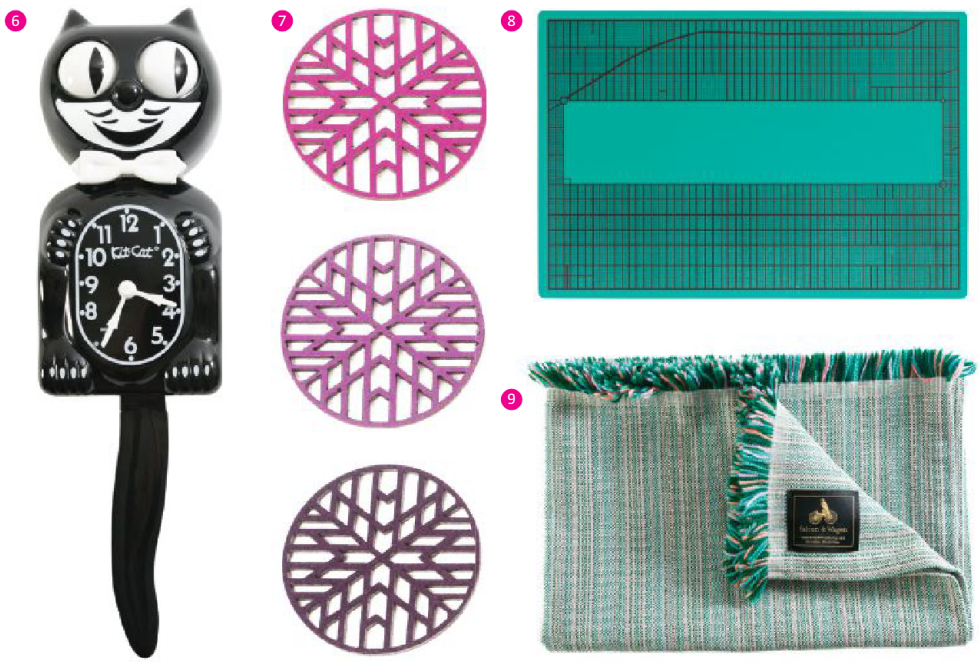
For: Design supervisors Picked by: Brady Wilcox, chief creative officer, the New Traditionalists
The early editions of these handcrafted and hand-drawn mugs are made from a limited supply of clay extracted from a 20'-deep hole beneath the Philadelphia workshop of American furniture company BDDW. "Making sure your boss is happy with his morning cup of joe ensures the odds will fall in your favor daily," Wilcox says. *Prices start at $80; bddw.com*

5. MAGNETIC WOOD BLOCKS, TEGU

For: Engineers and contractors Picked by: Griz Dwight
Hidden magnets inside these wood blocks allow for gravity-defying constructions. "Guaranteed hours of fun building for your contractor," Dwight says. "Wait, I take that back. They should have hours of fun building our projects." *$35 for a 14-piece set; tegu.com*

6. KIT-CAT CLOCK, EARL ARNAULT

For: Design supervisors Picked by: Fauzia Khanani
Americana-loving managers who "are always tight for time" will love this design classic, Khanani says. Dreamt up by Earl Arnault during the Great Depression, the U.S.-made, debonair, and comical Kit-Cat remains a hit more than 80 years later. *$50; momastore.org*



7. LASERCUT COASTERS, MOLLY M DESIGNS

For: Design colleagues Picked by: Fauzia Khanani

San Francisco designer Molly McGrath decided to create a line of lasercut homewares after laser-cutting building models at work. The geometric felt-and-leather coasters provide "a splash of color and an inspiring pattern to a space," Khanani says. *$45 (set of 4); mollymdesigns.com*

8. THE ORIGINAL GRID, NEIL CONLEY

For: Architectural interns Picked by: Fauzia Khanani

With a standard cutting grid on one side and a section of the iconic Manhattan city grid on the other, the self-healing mat by U.K.-based designer Neil Conley is a functional and fun reminder that the grid shapes our everyday lives, Khanani says. *$150; neilconley.co.uk*

9. HEIRLOOM BLANKET, FALCON & WAGEN

For: Interior designers Picked by: Fauzia Khanani

Score points with your recipients with this luxurious wool and cotton throw that adds "a little coziness to their pad or comes in handy on a fall picnic," Khanani says. Made in North Carolina, the blanket features the classic herringbone pattern in four colorways. *$450; falconandwagen.squarespace.com*

See more gift ideas for more project team members at *architectmagazine.com.*

TOUR CARPE DIEM

ROBERT A.M. STERN ARCHITECTS CREATES A LIGHT-FOOTED TOWER IN LA DÉFENSE, ONE OF THE MOST MALIGNED MODERNIST ENCLAVES IN PARIS.

Text by **Aaron Betsky**
Photos by **Peter Aaron/OTTO**

YOU DON'T EXPECT an architect to compare a 38-story office building he co-designed to Marcel Duchamp's 1912 *Nude Descending a Staircase (No. 2)*, the painting that caused such a scandal when it brought cubism to America in the 1913 Armory Exhibition. That is especially true if the architect is an American, the tower is in Paris, and he is a partner at New York–based Robert A.M. Stern Associates (RAMSA), the firm most of us associate with polite and expensive Neo-Classicism. Yet RAMSA partner Kevin Smith, AIA, who—together with fellow partner Meghan McDermott, AIA—designed the recently opened 489,700-square-foot Tour Carpe Diem, insists that this is "a cubist building—and a bit of an anthropomorphic one."

The tower, a speculative development for insurance company Aviva in Paris's La Défense district, is modernist in its skin and bones, as well as in its site and siting. The latter is the main reason for the building's slickness and vivaciousness: It is located in the area that the French have built up, since the 1960s, into the largest office complex in Europe (comprising almost 60 million square feet). Dozens of isolated office towers stand on a large plinth (or *dalle*), known as "the Pear" because of its shape, which sits at the end of the same axis as the Arc de Triomphe and the Louvre. The plinth, in high modernist fashion, contains all of the services that get people in and out by car or train, not to mention mechanical and trash services. In recent years, the Établissement Public pour l'Aménagement de la Région de la Défense (EPAD), the agency that runs the district, has tried

Previous Spread: The Tour Carpe Diem's defining feature is its pleated glass curtainwall, which was realized using a system from Yuanada Europe. **This image:** Conference rooms, enclosed in glazing from Polypane Glasindustrie, flank the rooftop garden and can be rented out for meetings. **Opposite:** The tower has two entries, one at grade (pictured), and one on the plinth that defines the ground plane of the development at La Défense.

to humanize this pedestrian environment and lunchtime eating and shopping area by renovating the few housing blocks in the area, but it remains a fortress of big business.

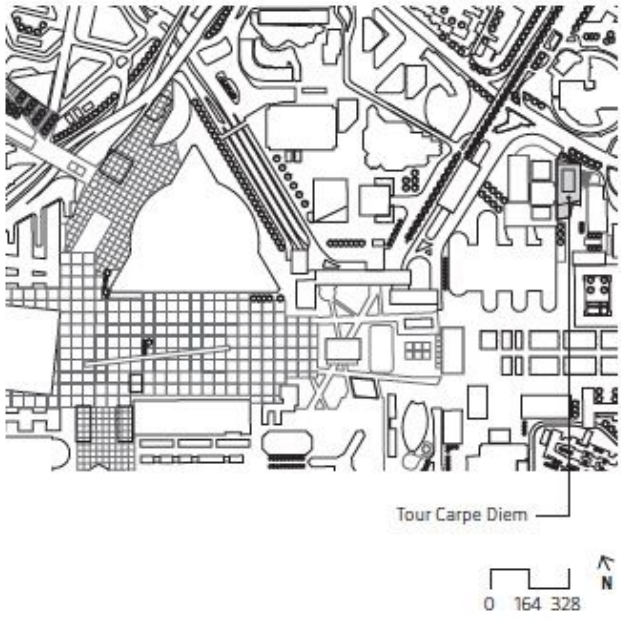
Carpe Diem is, in fact, the first building to break out of the Pear's confines by adding a stair connecting the plinth to the adjacent neighborhood, Courbevoie. "Everything comes from that diagonal connecting the *dalle* to the neighborhood for the first time," Smith says. "The diagonal offsets of the north and south façades, and the public interiors make visible that cut."

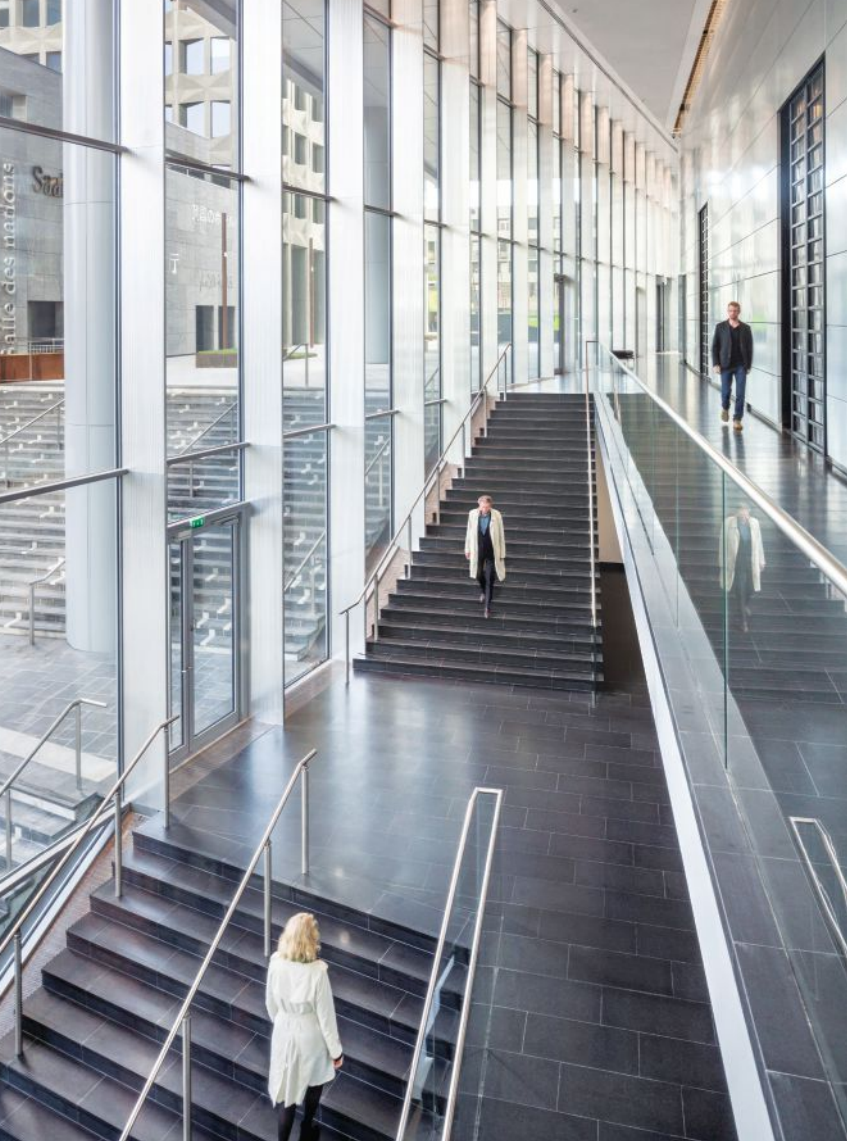
The zigzags of the short façades are what define the Carpe Diem. Smith and McDermott designed them both to break down the building's mass, and to provide the structure with an identity. They also ensure "that the tower always looks different, depending from where you see it, and what the light is like," McDermott says. "We wanted it to come alive in this otherwise rather dead setting, even in gray weather."

The architects, who developed the design for a competition in 2008, responded both to the specific and the general context. "As Americans coming to Paris," Smith says, "we picked up not just on the art that helped change our culture, but also on the diagonals hidden in French architecture: the struts in the Eiffel Tower and inside the Statue of Liberty, Eugène Viollet-le-Duc's constructions, and even the boulevards crossing Paris."

This responsiveness to both the specific and the general site continued in the designers' choice of glass. "We wanted something that was more blue-silver than bronze or green, so that it would dissolve into the sky from some angles, while being transparent from others," McDermott says. They

Site Plan





gave the folded, short sides shadow boxes for the moldings to emphasize the building's mass, while making the long sides sleek and transparent to maximize views and lighten the building's mass.

Within this acrobatic mass, Carpe Diem's public spaces open up its narrow site at ground level, while expanding the views at the top. "We really wanted to emphasize and strengthen the new connection," Smith says, pointing to the broad stairs that run up to the *dalle* both inside and outside the building. The opening in the plinth "was a request from Courbevoie and EPAD," says Joelle Chauvin, the managing director of Aviva Investors Real Estate France, and the project's client. "But what was wonderful was the way Stern responded, with this grand staircase both inside and out, that really made a wonderful sense of drama and ease out of the connection—it is superb."

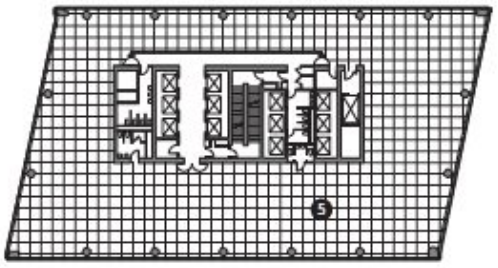
The tower has two front doors, one at the street and one on the plinth. In addition to the employee cafeteria on the ground floor and a full restaurant on the second floor for the 3,000 employees who will work in the building (a number that was mandated by French law), the developer also asked for an "oasis" within the "stone world of La Défense." They wanted "something more ancient and still within the mineral and modern world of La Défense," Smith says. Smith's and McDermott's response, in collaboration with landscape architect Ronan Gallais of Mutabilis, was a sunken winter garden, complete with a green wall, filled with both real vines and bronze ones created by the artist Stéphanie Buttier. "The winter garden was my idea," Chauvin says. "It is a bit of theater. Now, it is also a place for relaxation." An adjacent spa facility increases the possibilities to retreat in this cavern rescued from the tangle of service tunnels and mechanical equipment stowed in the plinth all around it.

The public space reappears at the tower's top. Carpe Diem's roof is a garden where employees can take in the air and the views over Paris while remaining sheltered behind the glass façade that continues up past them. Equally lavishly planted, this space is the active and outward-looking counterpart to the base's junglelike garden. Here, adjacent meeting rooms that resident firms can book are the alternative to the base's place of isolation and relaxation.

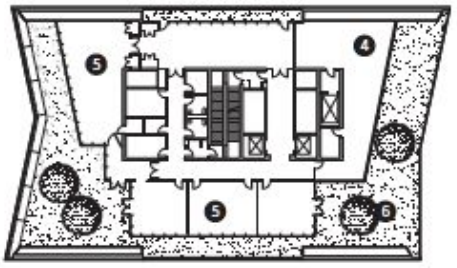
In-between all these generous spaces, 14,000-square-foot floors stack up. They are relatively small, at least by American standards, but the eccentric loading of the core to the west allows for large expanses on the building's more light-filled eastern side, while the western side accommodates private offices along a fire corridor. As the facets only occur on the two narrow sides that are visible from the surroundings, creating dramatic corner conditions, the long faces remain more workmanlike and efficient. The floors also have 9-foot clear ceiling heights and no interior columns (a rarity in French office buildings), in order to allow for the most flexible use.

For all of its fracturing of the glass office tower and addition of places of circulation, or just hanging out, in a manner that ameliorates the sameness inherent in the modern office tower, Carpe Diem's most remarkable achievement remains invisible. A combination of factors—the

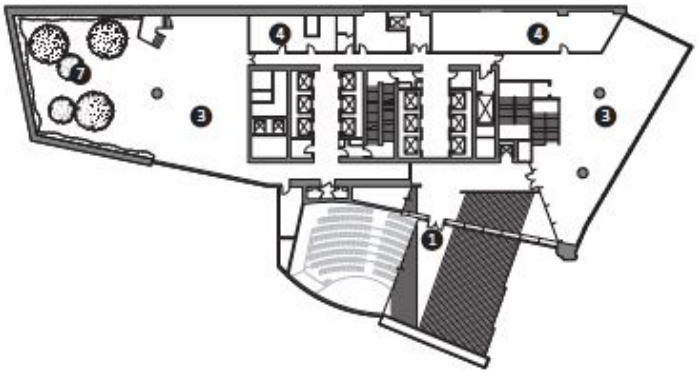
Seventh-Floor Plan



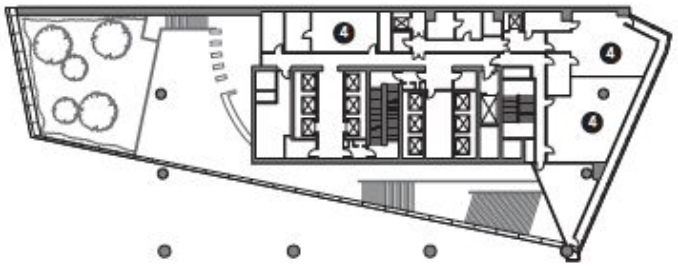
35th-Floor Plan



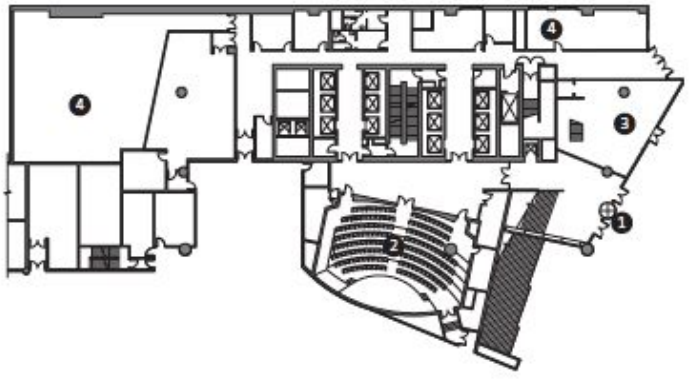
First-Floor Plan



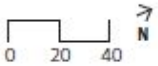
Second-Floor Plan



Ground-Floor Plan



1. Entrance
2. Auditorium
3. Retail
4. Service spaces
5. Office
6. Terrace
7. Winter garden



Opposite left: A grand staircase connects the ground floor and first floor inside the tower, and the street level to a plaza outside. **Opposite right:** A sunken winter garden at the base of the tower was developed in concert with landscape architect Ronan Gallais and garden designer Christian Fournet.

glass façade's angles and its surface performance, the building's orientation, computer-assisted shading and energy distribution, on-site ice storage, recycling of rainwater collected from the roof garden, chilled beams in the office floors, use of La Défense's central steam heat for standard energy loads (letting internal heating and cooling manage peaks), low general lighting combined with high-performance task lights, bicycle parking, and, last not but not least, geothermal wells—means that this building achieved both LEED Platinum status and its French equivalents, the designations of a *Bâtiment de basse consommation* (Building with low usage) and *Très haute performance énergétique* (Very high energy performance). "If it wasn't for some peculiarities in the local code," Smith says, "we could have made this a net-zero energy building."

In its appearance, in the way it opens up its public spaces at every level, and in the way it works, Tour Carpe Diem is a model of a light-footed office building. "The way Kevin and Meghan developed the design was very chic and free," Chauvin says, "but also new and energetic." Against the closed boxes that surround it, but also in contrast to RAMSA's more closed constructions, this is a structure that continues the modernist dream that architecture should reflect, refract, and open up the world around it, using the latest technology to make us both more comfortable and more at home in a world many see as alien. In one of the world's most maligned bastions of modernism, this denuding of the modernist traditions is ascending, rather than descending, towards a vision that is, in however incremental a way, more pleasant and hopeful than the one that came before.

Opposite: The elevator banks feature decorative metal doors that open out on circulation spaces lined in panels from Rheinzink. **Above:** Office spaces are configured to fit each tenant, and are lit here with recessed lighting from Philips.

FACULTY OF ARCHITECTURE, BUILDING AND PLANNING

FOR THE UNIVERSITY OF MELBOURNE'S DESIGN SCHOOL IN AUSTRALIA, NADAAA AND JOHN WARDLE ARCHITECTS HAVE CREATED A NEW BUILDING THAT WEARS PEDAGOGY ON ITS WELL-APPOINTED SLEEVE.

Previous Spread: The new architecture school building fronts a quad at the University of Melbourne; a façade clad in Bianco Precast concrete panels overlooks an adjacent greenspace. **This image:** A historic masonry façade, gifted to the school in 1932, is still under the green scaffolding in the distance as the installation completes. The pre-weathered zinc panels from VMZinc and the metal rainscreens and louvers from Fabmetal that clad this portion of the new building will provide a material contrast.

Text by **Ian Volner**
Photos by **Peter Bennetts**

IN THE EARLY 19TH CENTURY, when the architect Félix Duban undertook to transform Paris's hallowed École des Beaux-Arts, his signal maneuver was to place a late-medieval archway in the forecourt of the design academy's classical piazza. But the Arc de Gaillon wasn't just decoration: It was a radical teaching tool, one that demonstrated through its hybrid Gothic–Renaissance style how structure and form could evolve over time, and that there was more to architecture than Greco-Roman antiquity.

Nearly 200 years later and some 10,000 miles away, two very different firms—Boston's NADAAA and local firm John Wardle Architects (JWA)—have just finished a new architecture school, the University of Melbourne School of Design's Faculty of Architecture, Building and Planning building. Located in Australia's sunny second city, it's a building that doesn't appear, at first, to incite much intellectual curiosity: Clad on three sides in perforated aluminum sunshades, with a blank south front, it seems just another architectural curio on a campus already littered with evidence of every design trend of the last century-and-change.

But on closer inspection, this is a building whose didactic ambitions make Duban's look like a remedial course. Tom Kvan is the dean of the Faculty of Architecture, Building and Planning, and he describes the four big-ticket items that comprised the original brief: "The building had to be an investigation into the future of studio; into the future of academic work; it needed to be a living building; and it had to be a pedagogical building—one that teaches us and that we learn from constantly," he says. On all points, but most especially on the last, the Wardle–NADAAA team have carried the day with a solution that almost overflows with ideas—a place the School of Design's more than 3,000 students will not only learn in but learn from.

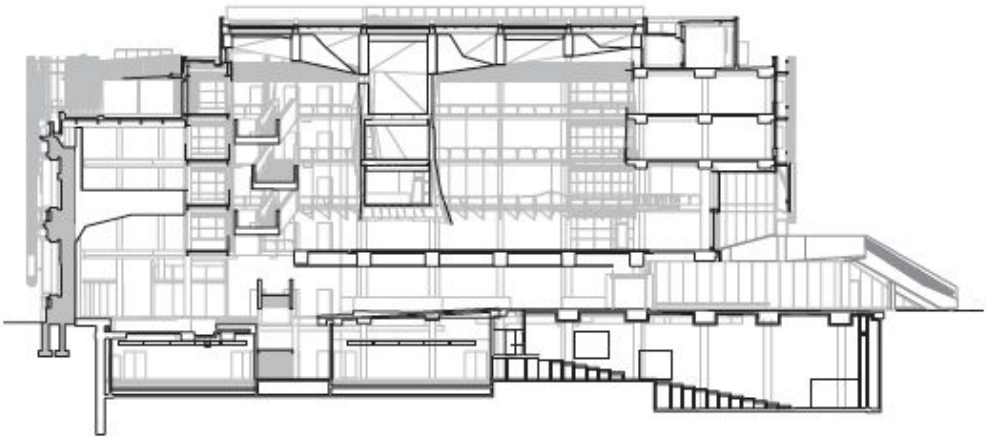
The collaboration came about rather serendipitously. "We were contacted first by John about three days before the competition deadline," recalls Nader Tehrani, the now-outgoing head of the architecture program at MIT and the founding principal of NADAAA. Tehrani had recently visited Melbourne, but "we hadn't known it," says John Wardle, principal of Collingwood, Australia–based John Wardle Architects, who'd been out of town at the time. As luck would have it, Tehrani had seen a Wardle project during his stay, and was sufficiently impressed to join forces almost instantly. "Nader said yes within about 20 seconds of me asking," Wardle says, and in short order the team found out that their proposal had made it past the first round of the design competition, which included more than 130 applicants.

Significant changes had to be made to their winning design to fit a tight university budget, but the core conceit of the design remains largely unchanged. "The building as a type is very simple," Tehrani says. "It's an atrium building, a donut." It's a donut with a difference, however, as this one is lofted up a story: The first-floor entry level is a continuation of the campus, with fabrication workshops, the library, and exhibition spaces arrayed around a central concourse; only on ascending the stairs does the visitor find the atrium, with four stories of galleries ringed around an open lounge space topped by a dramatic coffered wood ceiling.

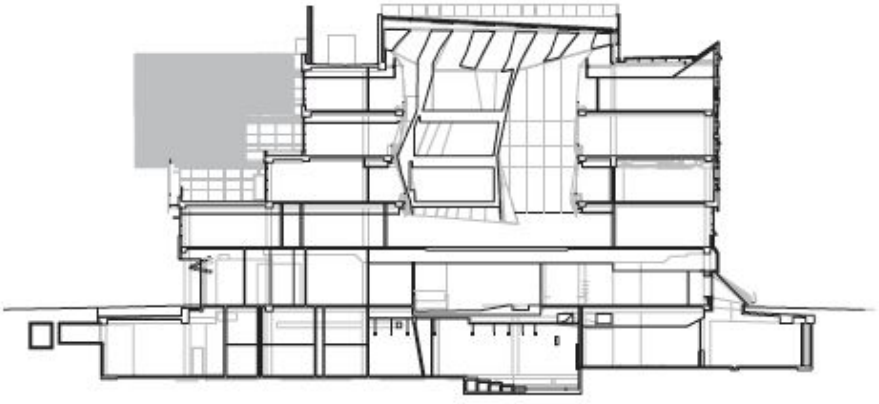
The list of design details, and of the programmatic significance of each, is fairly astonishing, a result of a Skype-based collaboration that Wardle describes as "a conversation that constantly generated ideas." The undersides of several staircases, for example, are unfinished, exposing

The steel-and-concrete-framed building is designed to showcase a variety of architectural systems to the students inside, who are learning the craft of architecture. Thus the structure of such elements as this cantilevered stack of workspaces on the northeastern edge of the building is left exposed. The metals fins and louvers shade the glass-enclosed volume of the building.

Section A–A₁



Section B–B₁



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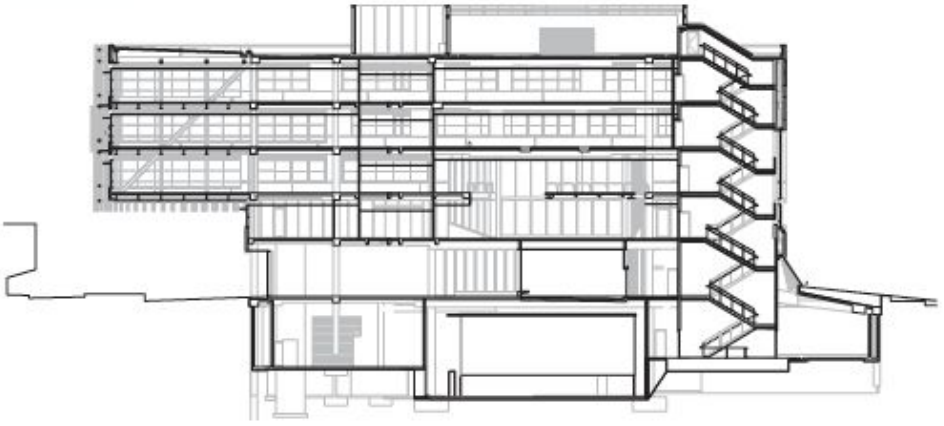
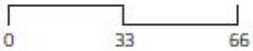
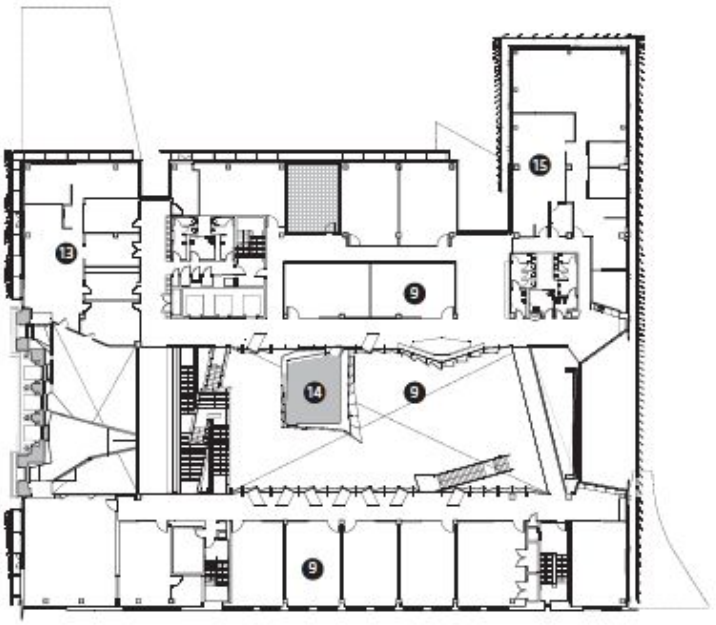
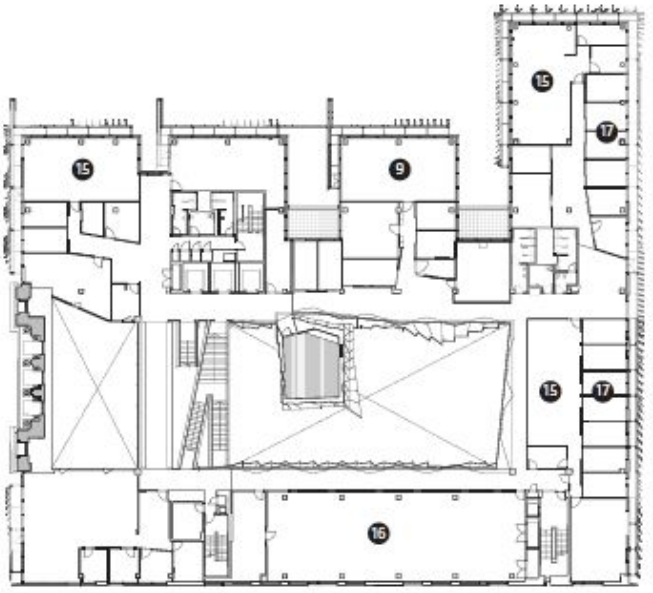




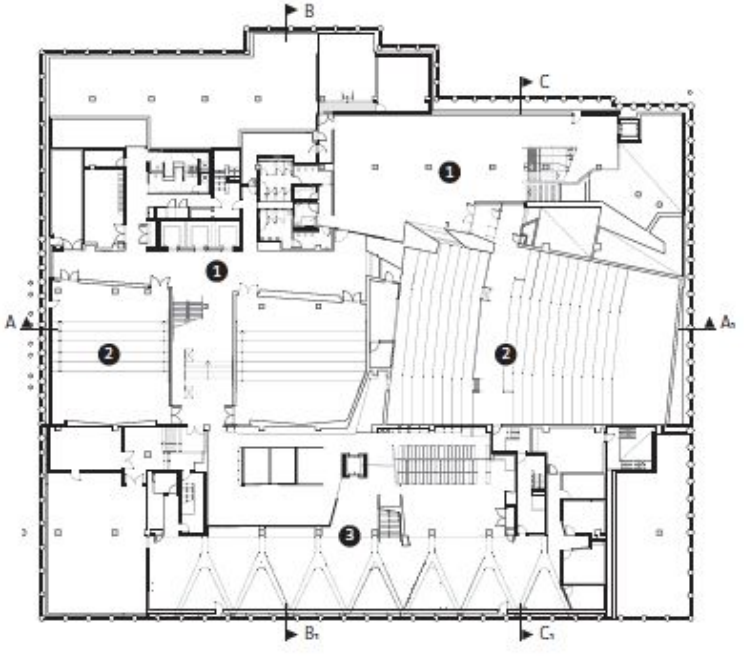
Third-Floor Plan



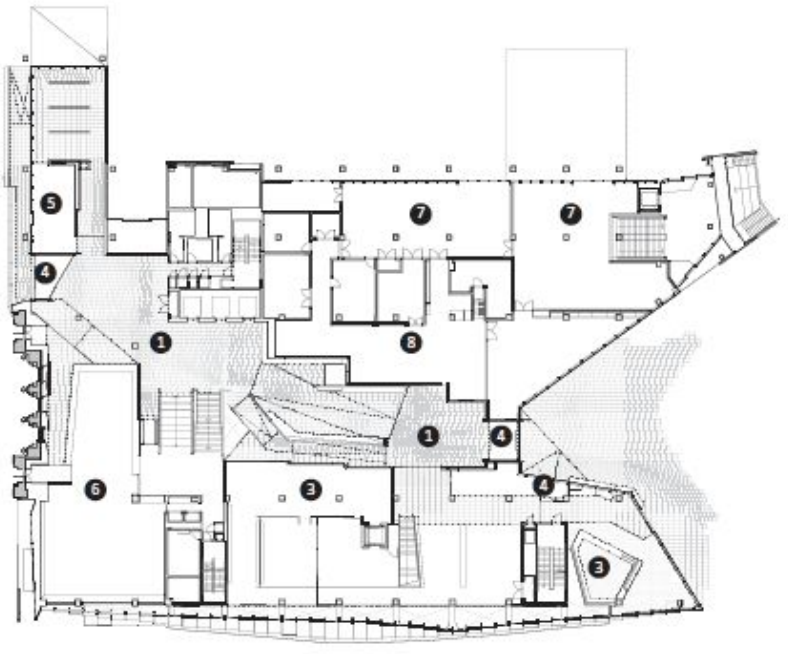
Fourth-Floor Plan



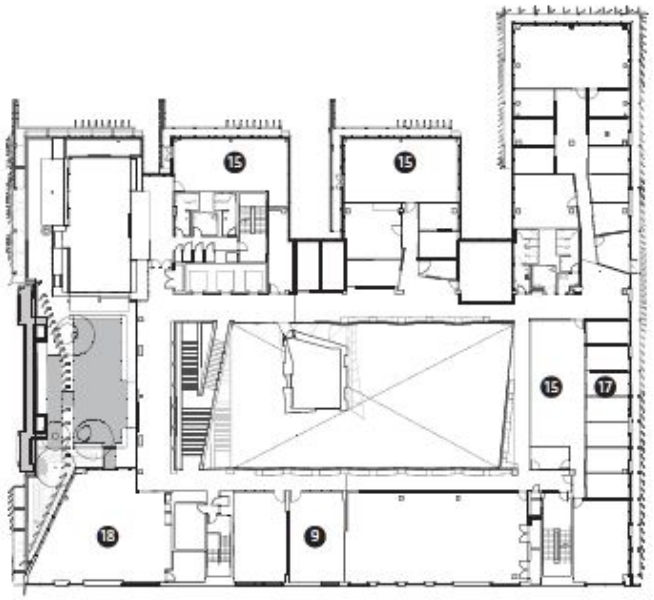
Basement-Level Plan



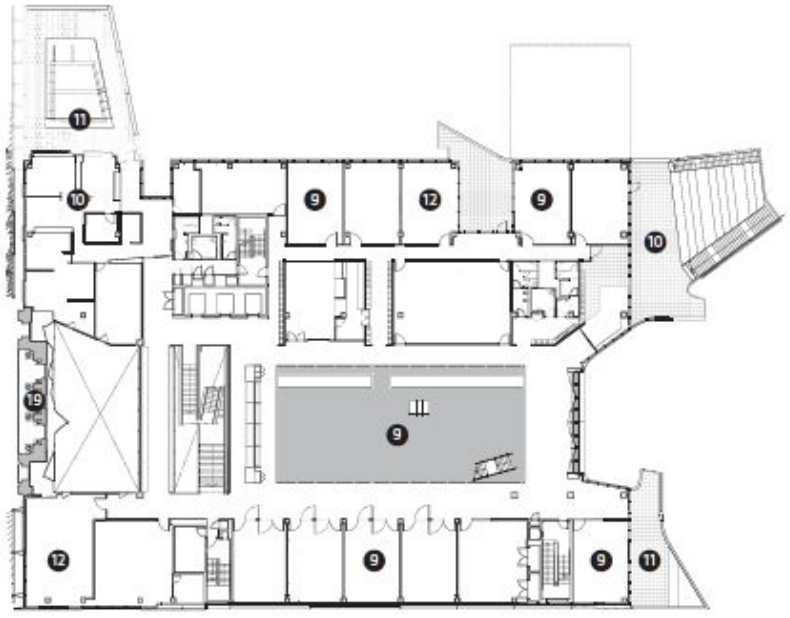
Ground-Floor Plan



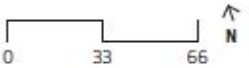
Fifth-Floor Plan



Second-Floor Plan



1. Foyer
2. Theater
3. Library
4. Entrance
5. Café
6. Exhibition
7. Workshop
8. Model-making room
9. Design studio
10. Office
11. Terrace
12. CAD Studio
13. I.T. department
14. Suspended studio
15. Open work area
16. Study space
17. Enclosed work area
18. Lounge
19. Historic Façade

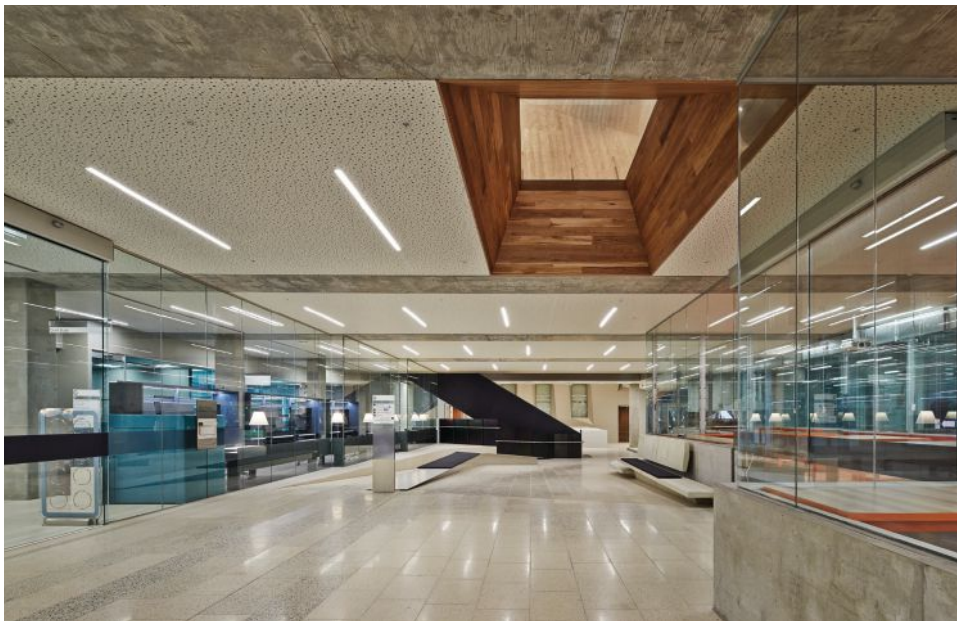


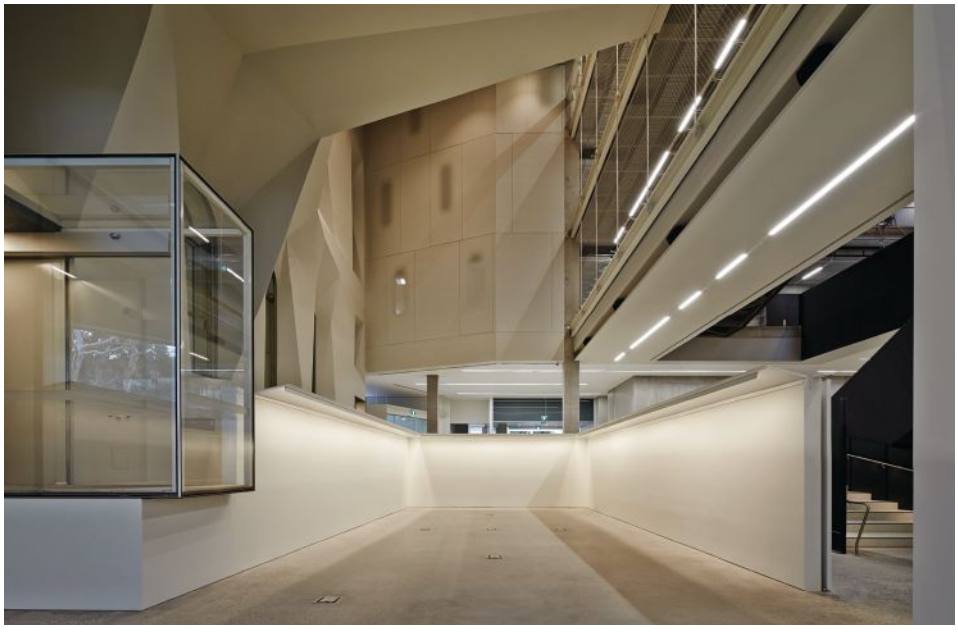
the steel to "reveal how the stair is constructed," as dean Kvan puts it. In the entryway concourse, there's a small glass portal in the ceiling so that non-architecture students passing from east to west can get a glimpse into the light-filled atrium above, a little teaser to encourage them to head upstairs and see what the designers are up to. From the metal protective mesh surrounding the galleries to the worktables embedded partially in it to help hold the screen in tension; from the swiveling panel walls of the atrium-level studios to the glass windows near the basement auditoriums that give students a glimpse into the boiler rooms—almost nothing in the building is without some educational import concerning materials, building science, and the art of architecture.

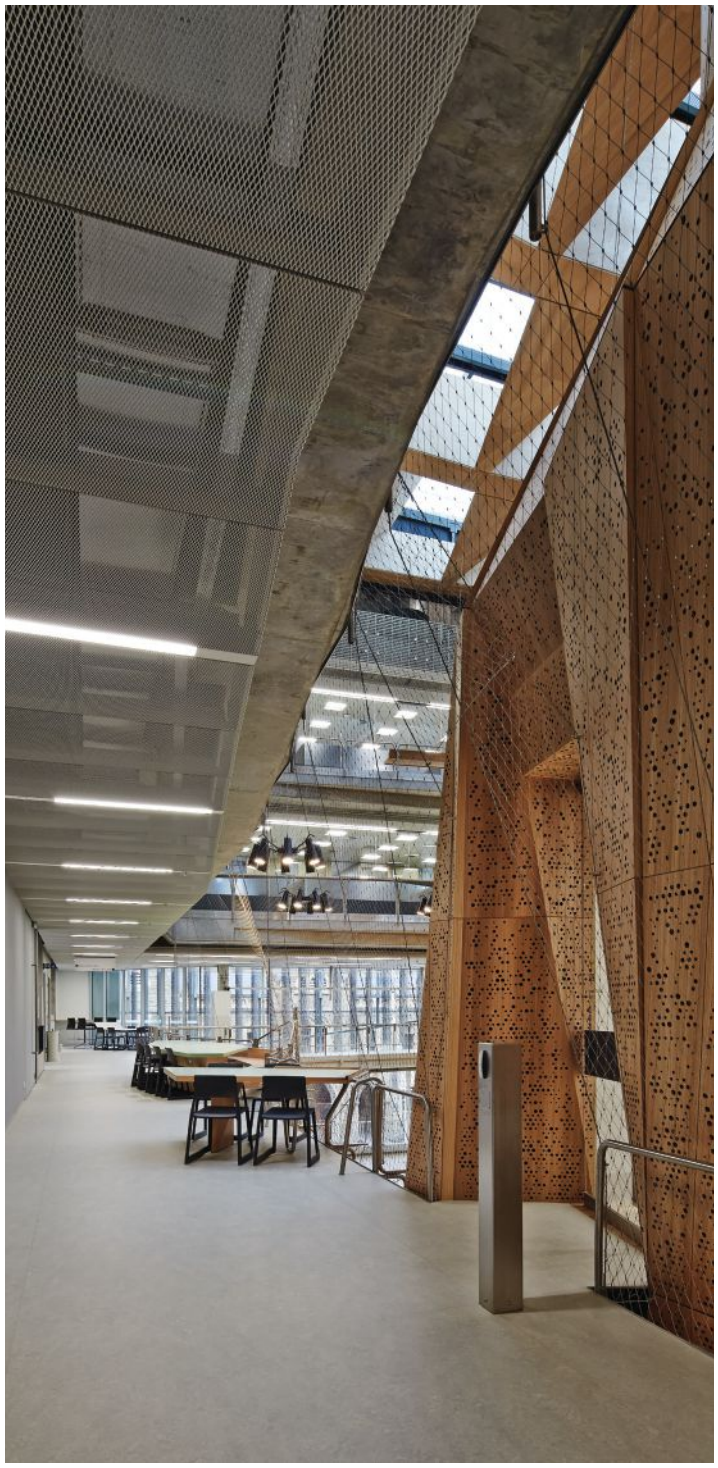
All of these little Arc de Gaillon moments inside are set off by one big one on the exterior. What had been the decorative façade of the Joseph Reed–designed Bank of New South Wales, completed in 1859 and gifted to the school after the original building's demolition in 1932, has been tacked onto a portion of the new architecture building just as it had been to the school's now-demolished previous structure. This extraordinary set piece and beloved campus fixture (which is secreted under green scaffolding, and will be until its installation on the new structure is completed in December) is given an appealing bit of deference by the brash metal building that surrounds it, with the irregular zinc louvers billowing around it slightly—"like a curtain," says JWA principal Stefan Mee—a lesson in how even the past can find a place in the architecture of the future.

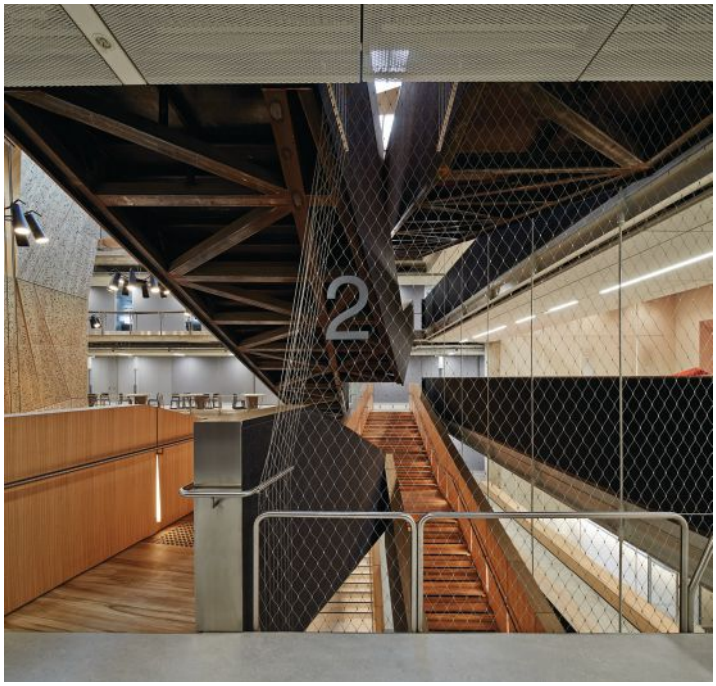
So profuse, in fact, is the structure's built-in curriculum that it leaves one a little in doubt as to how much its already-harried students will be able to absorb. "The more we got into it, the more scripting we felt was required," Wardle says, and the result is a building with a very thick plot indeed. What is likely to become its most recognizable feature, the striking Suspended Studio that dangles like a wooden lightning bolt in the atrium, is also a sort of metonym, a symbol of the whole—a place where the building, and the students in it, seem to be flying beyond the limits of the possible. That, claims Tehrani, is the whole point, a mark of how much the necessity of dynamism and adaptability has become the hallmark of architectural education since the days of the Beaux-Arts. "We're still always working with an understanding that the building has to be timeless," he says. "But architecture is changing radically."

Opposite: Concrete trusses support the roof of the library, which extends under a lawn on the structure's south side. **This page top:** Acoustic ceiling panels help to dampen sound in the stone, glass, and metal-lined foyer. A wood-lined coffer from Timberbuilt gives a glimpse of the main design studio above. **Middle:** On the basement level, acoustic wallcovering helps control sound in the area outside the main auditorium, seen through the blue glass. Concrete and ductwork are left exposed throughout the structure. **Bottom:** To finish the exposed concrete to pristine smoothness, the architects turned to products like Renderoc.









Opposite: The atrium features a faceted wooden structure called the Suspended Studio. **Above left:** Around the entrances to the Suspended Studio on the upper levels are open work areas where students can collaborate. **Top right:** The underside of the switch-back stair is left exposed so that students can understand its steel structure. **Bottom right:** Each level on the stair is noted by a floor number attached to the metal mesh that lines the walls of the atrium.

JESUIT HIGH SCHOOL CHAPEL

HODGETTS + FUNG PRINCIPALS HSINMING FUNG AND CRAIG HODGETTS BRING A HANDS-ON APPROACH TO THE DESIGN OF A CHAPEL ON A CATHOLIC HIGH SCHOOL CAMPUS IN CARMICHAEL, CALIF.

Interview by **Deane Madsen**
Photos by **Joe Fletcher**

I understand this project lasted seven years. Why so long?
Hsinming Fung, AIA: There were a couple of factors that delayed the process: One was the acquisition of the land for the project. The second one had to do with the design of a chapel that would have a cross on the roof, which created some outcry from some neighbors from the surrounding area. The project went into hiatus while we had to fight for it and go to community meetings, so it went on hold for a couple of years.
Craig Hodgetts, FAIA: Of course, when you're working with eternity and religion, what's seven years?

How did you start to shape the design and form of the building?
Fung: When we began to develop the design of the project, we presented several ideas to our client, the Rev. Greg Bonfiglio, who was then the president of the high school. One of the things that was challenging for us—but something that Craig and I always get really excited about—was that there was a tension between the volume or the envelope of the building, the mass of the building, and what was going on internally. We developed this very embracing, curved wall. But Father Bonfiglio moved to another parish, and our second client, the Rev. David Suwalsky, had very different ideas, such as how things should be more simple. Coming from St. Louis, he was very taken by the Pulitzer Arts Foundation by Tadao Ando, Hon. FAIA, which he used as an example to explain his understanding of the liturgy.
Hodgetts: It was really interesting, given the tension between the neighbors, which was very self-serving and pragmatic, and the spiritual demands on the other side. It was quite remarkable to have such a bipolar setting for the design because we were constantly pulled back and forth between higher-level and really base-level concerns. For us, it was very stimulating. We weren't frustrated by it not being a straightforward design process. Every little bit added richness to the final solution.

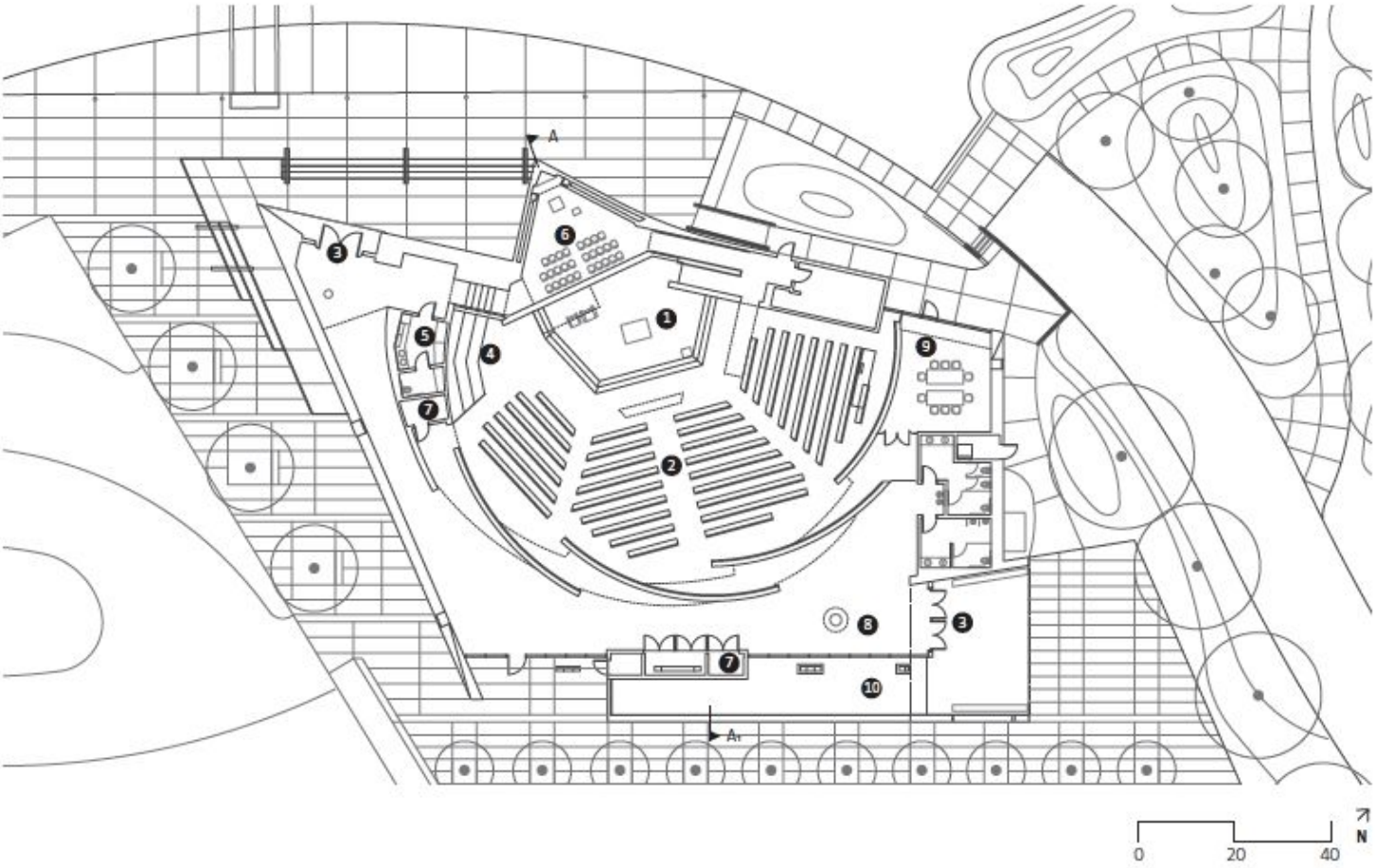
How did the design develop as you addressed these varying concerns?
Hodgetts: The footprint was pretty much cast in stone because of the environmental impact review process and the pragmatic issues that the neighbors brought up. But at the same time, there was a profound liturgical change between Father Bonfiglio and Father Suwalsky. So going from a rather cluttered (in a positive way) medieval scape within the building—which was inspired by Father Bonfiglio's desires—to the very clean minimalist interior that Father Suwalsky was envisioning was a wrenching experience that stretched us from a design point of view. Ultimately, we welcomed the change of agenda toward something with more architectural potential, rather than a narrative experience.

How did you site the building within the context of the school campus?
Fung: The building originated from the consideration of this chapel as part of a grouping of cultural facilities for the campus, including a performance center just opposite. It's an end point for the campus, so it addresses two different approaches: one is the formal approach from the street and the other is from the school, for students coming toward the chapel.

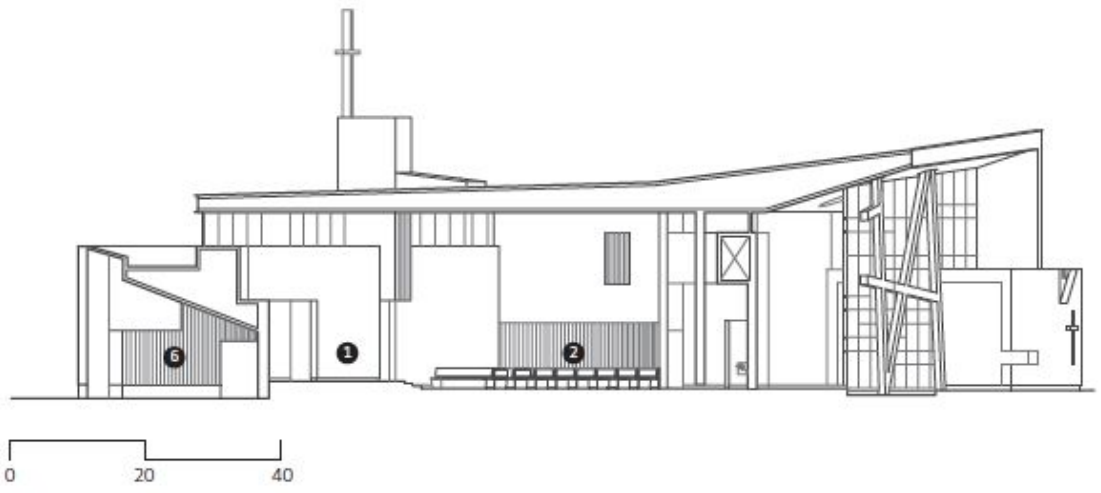
Previous spread: Hodgetts + Fung lifted the roof above clerestory windows along the north elevation to allow diffuse light into the chapel. **Opposite:** On the chapel's west elevation, the architects carved pocket windows through the otherwise solid mass of the wall. **This page:** The east entrance brings visitors past a reflecting pool, which allows further play with light through custom window systems from All Weather Architectural Aluminum and Oldcastle BuildingEnvelope.

This page: The angles of the façade, colored with Vanceva films from Eastman (see Curtainwall Light Box Detail, p. 110), distort around the sanctuary's curvilinear walls.

Site Plan



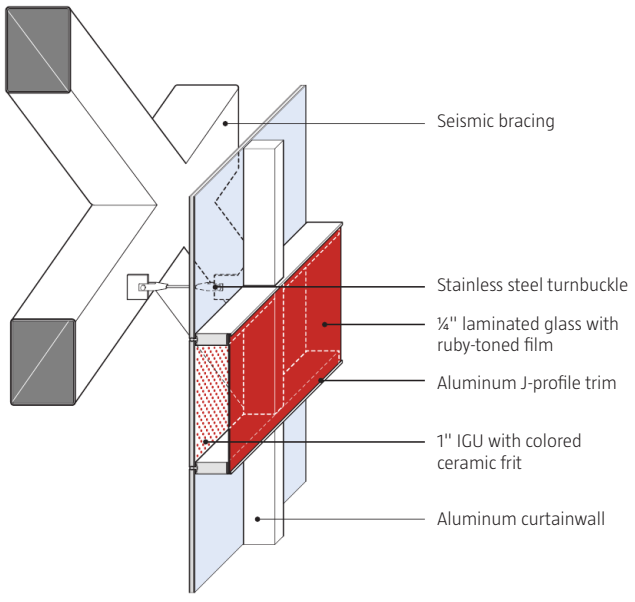
Section A–A1



1. Altar
2. Sanctuary
3. Entrance
4. Choir
5. Sacristy
6. Lady Chapel
7. Storage
8. Baptismal font
9. Conference room
10. Reflecting pool

This page: The main sanctuary features a custom altar and pews, also designed by Hodgetts + Fung, as part of the firm's holistic approach. Ash wood slats act as both acoustic baffles and HVAC grilles.

Curtainwall Light Box Detail



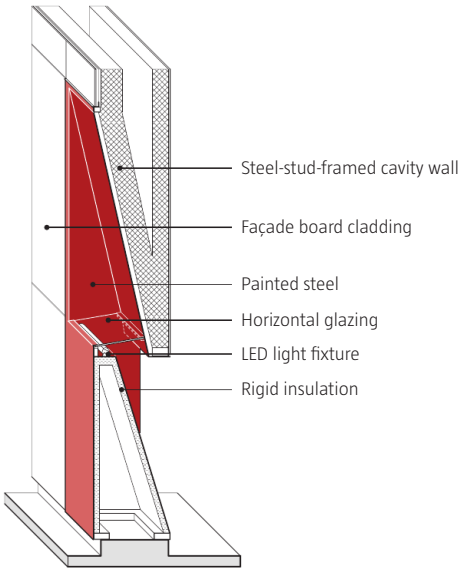
You've talked about the integral role that light plays in this project. How did you emphasize that and find ways to bring it in?
Fung: One of the things that we were very interested in is that the building has multiple identities, and each side of the building, and the apertures on each, are very different. Outside of the sanctuary, it's very bright. But in the sanctuary, we were very interested in calibrating how light would come in and down onto the altar—whether it was through a skylight or pocket window, allowing a stream of light to come in as an accent, as opposed to washing the space. The light, and how we introduce it, brings movement and adds cadence to the experience of entering the chapel.

What techniques did you use to develop the quality of light?
Hodgetts: We built a huge model, about 6 or 7 feet long, and we were at it with mat knives and masking tape, changing the shape and configuration of the apertures and their orientation. We took the model out to our office parking lot to check out what was happening with the light. It was very much an analog trial-and-error process.
Fung: It was important for us to give the glass a thickness. We wanted it to have a three-dimensional feel, so we created a light box which has a frit pattern on one side, and colored glass on the other. We gave the stain and frit pattern color, and also painted the inside of the box. We started putting swatches of different colors on the inside of the model, to make sure that we had the right combination of color and reflectivity. We did that study this summer with our interns. They realized it was just not one quick decision of assigning a color, but that it involved understanding it, and looking at it under real conditions. It's so fundamentally important to teach that kind of intensive nature of study as part of the design process.

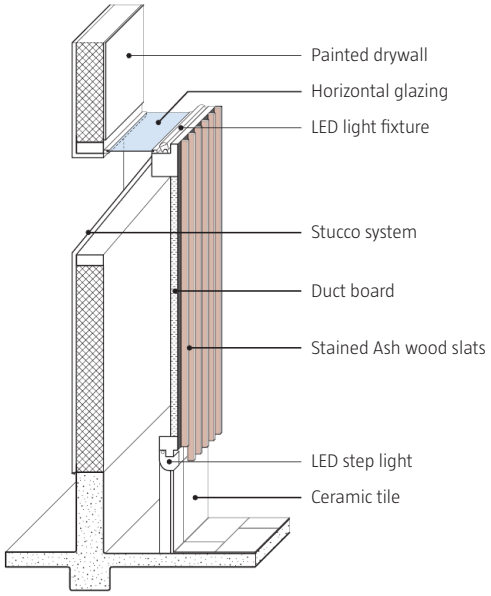
How did you arrive at the decision to express the structure so visibly, especially on the south façade?
Fung: We wanted to support the glass, and we also needed to have seismic bracing for the building. It was important for us to express the building on that side, so we braced it with a pattern that reflected what Father Bonfiglio called a "crown of thorns;" that came out of earlier sketches where we were studying a different version of the project.
Hodgetts: Also, we had concerns with keeping the roof as a shelter element and not having columns—and certainly not seismic bracing—in the interior of the building. The idea of putting [the bracing] out on that far plane was the only one which our engineer could make work seismically because of our other concerns about keeping the envelope clear. So we utilized the engineering aspect of it and we transformed it into something that has a kind of subtle overtone of Catholic liturgy and those sort of tangled branches that you see so often in religious paintings. But it very much evolved as we worked.

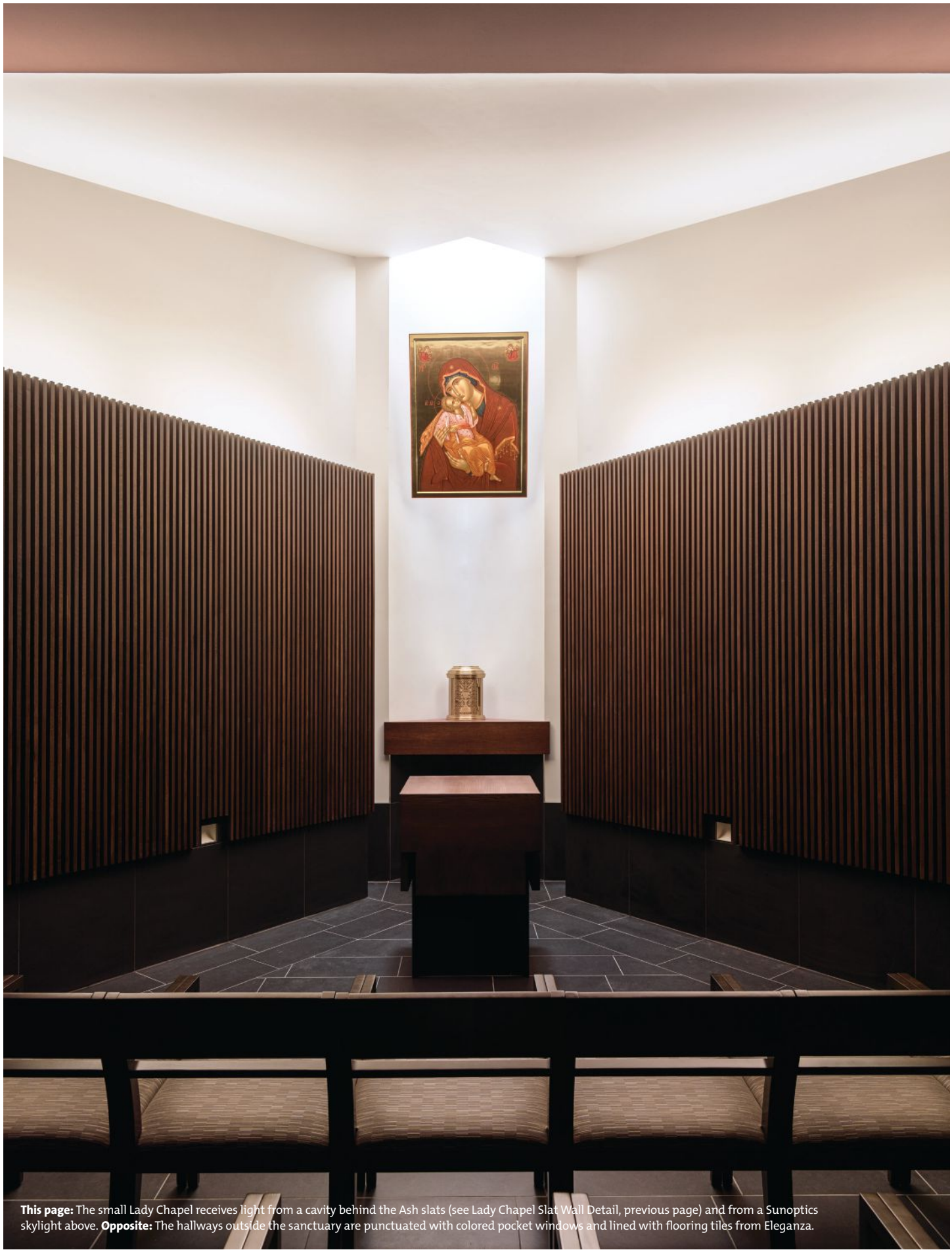
Your analog approach to research had a positive outcome on the design of this building. How does that hands-on mentality influence your work?
Hodgetts: There are certain things about the tactile nature of a building that we still feel are best approached physically, rather than digitally. The thing that you can do, let's say with our big model, is make very minor and subtle changes, perhaps adding a half an inch to a window slot, which profoundly affect the light. You wouldn't have that happening in a 3D-printed model. And so if you want to make an architecture in which things are palpable and tactile, the analog approach seems to be an inevitable step. You can't avoid it—or you avoid it at your peril.

Pocket Window Detail



Lady Chapel Slat Wall Detail





This page: The small Lady Chapel receives light from a cavity behind the Ash slats (see Lady Chapel Slat Wall Detail, previous page) and from a Sunoptics skylight above. ***Opposite:*** The hallways outside the sanctuary are punctuated with colored pocket windows and lined with flooring tiles from Eleganza.

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TULA HOUSE

VANCOUVER-BASED PATKAU ARCHITECTS BRINGS STEEL, CONCRETE, AND RIGOROUS LINES TO A WINDSWEPT CLIFFSIDE SITE ON QUADRA ISLAND IN BRITISH COLUMBIA.

Text by **Katie Gerfen**
Photos by **James Dow/Patkau Architects**

WHEN ERIC PETERSON and Christina Munck invited Vancouver, B.C.–based Patkau Architects to help them place their new home on a cliff-side site on nearby Quadra Island, the team, as the designers of the new structure, didn't cut themselves any slack. Accessed via a road that wends through a forest of fir and maple trees, and atop an uneven, moss-covered basalt outcropping 44 feet above a windswept beach, the site boasts a view across the water to mainland British Columbia. "That single panoramic expanse and view is one of the things you notice most immediately about the site," says David Shone, a principal at Patkau and the project architect for the Tula House.

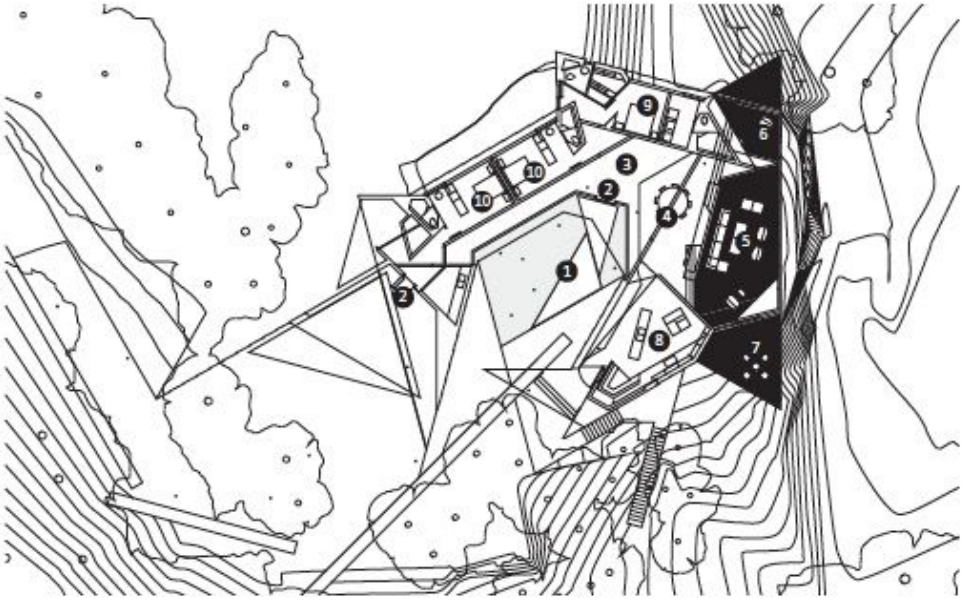
In order to take full advantage of the view, the architects chose to position the house at the edge of, and cantilevering out from, the bluff. But they didn't want to give the game away too quickly: A glass-lined entrance courtyard is enveloped by the C-shaped, 4,500-square-foot structure, and offers only glimpses of the view beyond. From the carport, visitors are funneled down a long concrete-lined corridor, and it is only upon reaching the living area that the expansive view is revealed, through a long ribbon of glazing that lines the oceanfront side. The view is unobstructed by columns or thick mullions—the result of the floor and ceiling planes being independently cantilevered. A cast-concrete floor, intended to read as an extension of the rock face, transitions to wood to denote the point at which visitors leave terra firma and walk onto the cantilever.

But while it is certainly the most dramatic, the ocean vista is not the only view in the home. "It's actually a very complex site," Shone says, noting that the firm referred to it as a "five-site house." The glazed courtyard captures views of the surrounding forest, low windows in the master bedroom frame a mossy rock wall, a glazed panel in the cantilevered floor section looks down over the driftwood-strewn beach, and thin skylights in the linear wood-batten ceiling showcase the tree canopy and sky beyond.

Achieving the level of design rigor and structural bravura showcased in elements such as floating concrete walls was not easy to achieve on the remote site, and a building boom in Vancouver kept most of the construction crews that Patkau would normally use busy on the mainland. The architects turned to a local construction crew that had, until this project, never worked with exposed architectural concrete. "They developed techniques onsite and rigged up interesting scaffolds and carts to roll up the large pieces of glass," Shone says. Any doubts were quickly erased as the project developed, and the level of intended detail was reached. "In hindsight, they really were the right people to build the project," Shone says. "They are very good craftsmen."

Previous page: The expansive glazed façade overlooking the Pacific Ocean incorporates thick tempered glass, reinforced by structural glass fins at the mullions to withstand larger-than-normal wind loads. **Opposite:** An entry courtyard is framed by the overhanging steel structure of the vegetated roof, which is cantilevered independently from the floor slab to allow for uninterrupted glazing. **Right:** The stained wooden battens of the ceiling plane in the dining room are interrupted by a slender skylight that bisects the space. Acoustic batting above the battens modulates sound so that the interior can be used for large events.

Floor Plan



1. Entry courtyard
2. Entrance
3. Foyer
4. Dining room
5. Living room
6. Office
7. Terrace
8. Kitchen
9. Master bedroom
10. Guest bedroom

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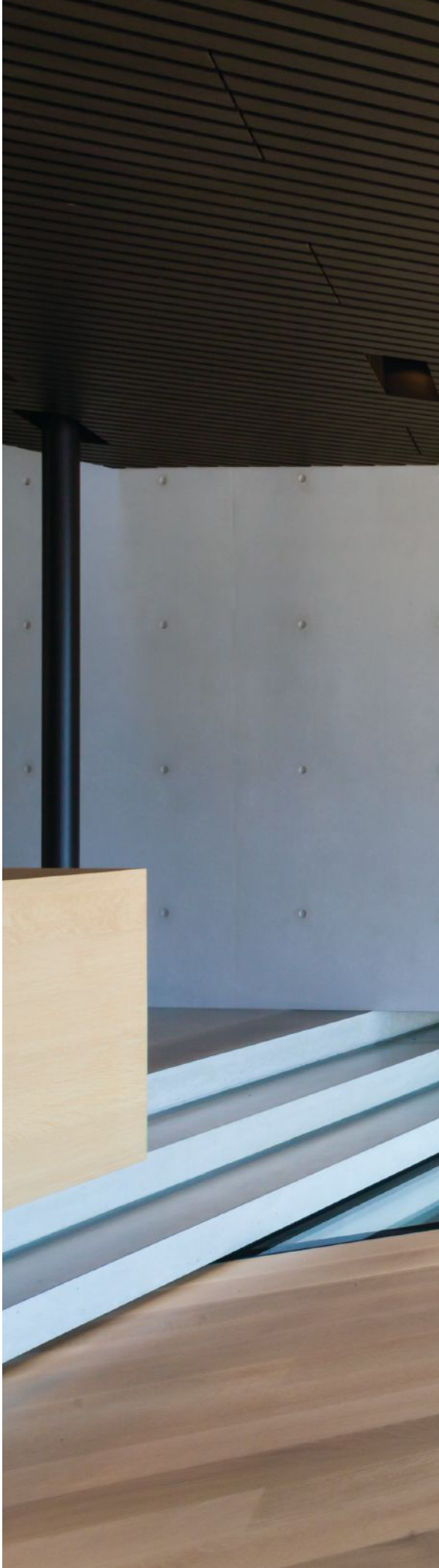

Above: A green wall lines the kitchen, which features finished concrete floors. A glass-enclosed breakfast nook overlooks the surrounding forest.
Opposite: A floating concrete wall separates the living room from the office beyond; the wooden floor denotes the beginning of the cantilevered section of the house, and is differentiated from the cast-concrete slab of the rest of the house. A triangle of glass in the floor allows for views of the beach below.

Tour Carpe Diem, page 84

Project Tour Carpe Diem, La Défense, Courbevoie, France
Client Aviva France
Architect Robert A.M. Stern Architects, New York—Robert A.M. Stern, FAIA (senior partner); Meghan L. McDermott, AIA, Kevin M. Smith, AIA (project partners); Renaud Magnaval (project manager); Frederic J. Berthelot (project associate); Rebecca Atkin, Anya Grant, Milton Hernandez, Trevor Laubenstein, Douglas Neri, Kaveri Singh, Charles Yoo, Young Jin Yoon (project assistants)
Associate Architect SRA-Architectes—Hervé Metge (partner); Laurence Gorgiard, Pierre Michel Desgrange
Interior Designer Jean Jegou Architecture Intérieure
Mechanical/Electrical Engineer SNC-Lavalin
Structural Engineer Terrell
General Contractor Spie Batignolles; SBX
Landscape Architect Mutabilis—Ronan Gallais
Lighting Designer Philippe Almon
Sustainability Consultants Cabinet Hubert Pénicaud; Atelier Ten
Curtainwall Consultant Emmer Pfenninger Partner
Surveyor Cabinet Daniel Legrand
Size 489,700 square feet

Faculty of Architecture, Building and Planning, page 92

Project Faculty of Architecture, Building and Planning, University of Melbourne, Melbourne, Australia
Client University of Melbourne
Architect John Wardle Architects and NADAAA in collaboration
Collaborating Architect John Wardle Architects, Collingwood Victoria, Melbourne, Australia—John Wardle, Stefan Mee (principals-in-charge); Meaghan Dwyer (senior associate); Stephen Georgalas (project manager); Bill Krotiris, Andy Wong, Jasmin Williamson, Adam Kolsrud, Alex Peck, Barry Hayes, Jeff Arnold, Amanda Moore, James Loder, Danny Truong, Stuart Mann, Meron Tierney, Kenneth Wong, Sharon Crabb, Yohan Abhayaratne, Rebecca Wilkie, Ben Sheridan, Giorgio Marfella, Kirrilly Wilson, Elisabetta Zanella, Adrian Bonaventura, Genevieve Griffiths, Michael Barraclough, Matthew Browne, Maria Bauer, Anja Grant (team)
Collaborating Architect NADAAA, Boston—Nader Tehrani (principal-in-charge); John Chow (project manager); Arthur Chang (design coordinator); Katie Faulkner, AIA, James Juricevich, Parke MacDowell, Marta Guerra Pastrián, Tim Wong, AIA, Ryan Murphy, Ellee Lee, Kevin Lee, Rich Lee (team)
M/E Engineer/Project Manager/Security Aurecon Group
Structural/Civil Engineer Irwinconsult
Landscape Architect Oculus
Lighting Designer Electrolight
Geotechnical Engineer Douglas Partners
General Contractor Brookfield Multiplex
Quantity Surveyor Rider Levett Bucknall
Building Services/Sustainability Consultant Umow Lai
Heritage Architects RBA Architects + Conservation Consultants
Size 15,772 square meters (169,768 square feet)

Jesuit High School Chapel, page 104

Project Jesuit High School Chapel, Carmichael, Calif.
Client Jesuit High School—Rev. David Suwalsky
Architect Hodgetts + Fung, Los Angeles—Craig Hodgetts, FAIA (principal architect, creative director); Hsinming Fung, AIA (principal-in-charge); Amber Langlois (project architect); Mariam Mojdehi (project architect); Darin Vieira, Assoc. AIA (project architect)
Mechanical Engineer Capital Engineers Consulting
Structural Engineer Thornton Tomasetti
Electrical Engineer CRO Engineering Group
Civil Engineer Warren Consulting Engineers
Geotechnical Engineer Wallace-Kuhl & Associates
Construction Manager Vanir Construction Management
General Contractor Swinerton Builders
Landscape Architect Yamasaki Landscape Architects
Architectural Liturgical Consultant Gilbert Sunghera
Size 10,478 square feet
Cost $5.5 million

Tula House, page 115

Project Tula House, Quadra Island, British Columbia
Client Eric Peterson and Christina Munck
Architect Patkau Architects, Vancouver, British Columbia—John Patkau, AIA, Patricia Patkau, Hon. FAIA, David Shone, Mike Green, Dimitri Koubatis, Greg Boothroyd, James Eidse, Marc Holland, Tony Mah, Henry Murdock, Ben Raimes, Thomas Schroeder, Craig Simms, Tony Wai
Structural Engineer Peterson Galloway
Mechanical Engineer Hirschfield Williams Timmins
Contractor J Toelle Construction
Size 4,500 square feet

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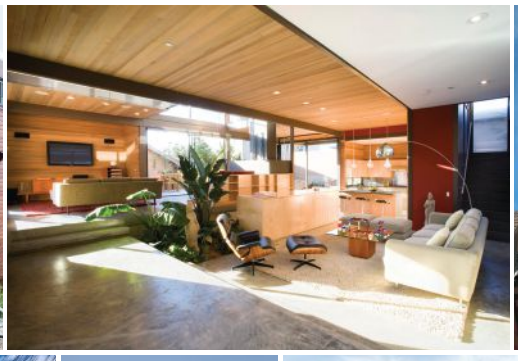

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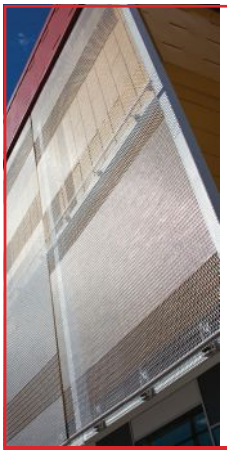

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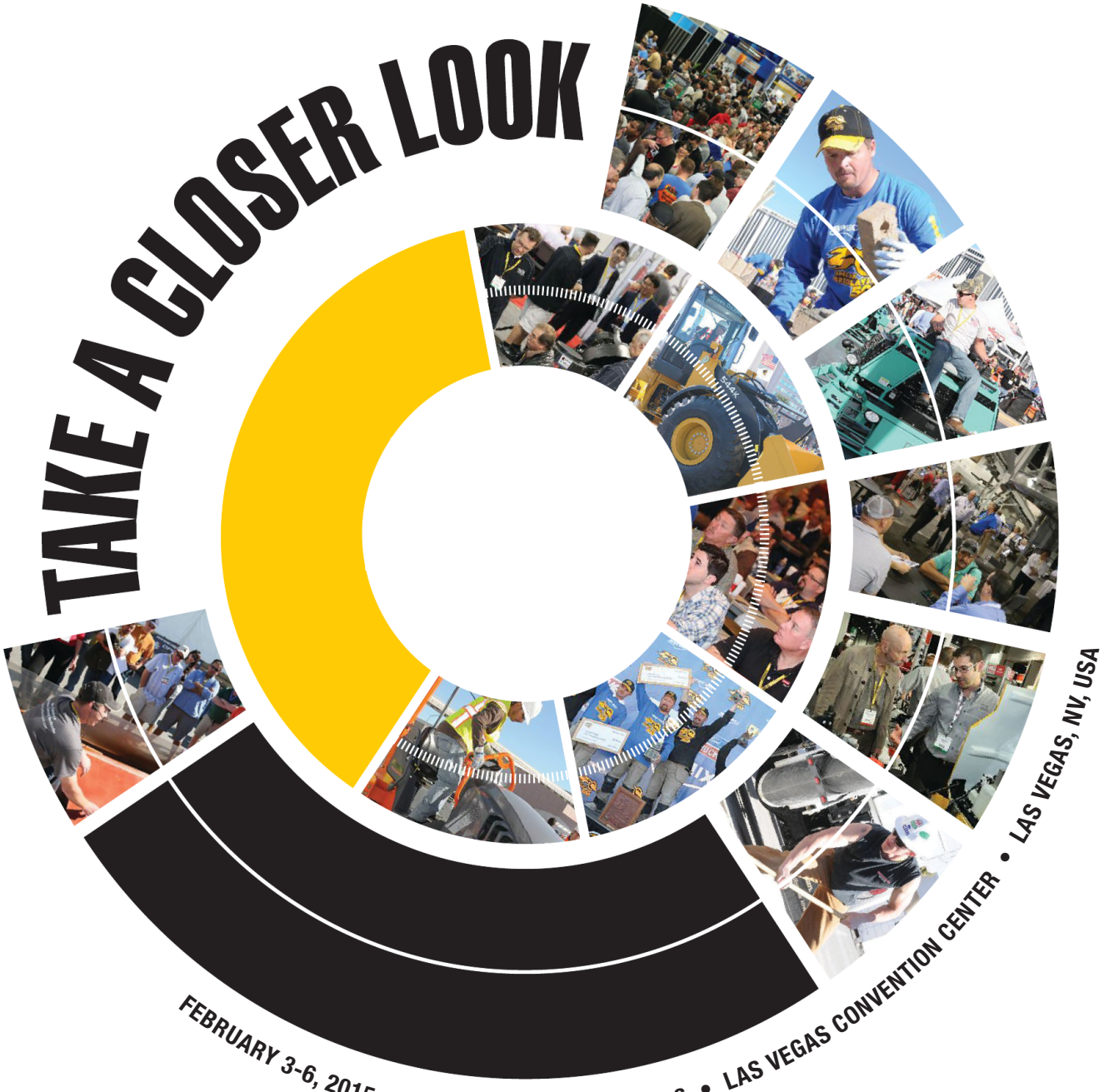

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Text by **John Morris Dixon, FAIA**

IN 1970, PAOLO SOLERI began construction at Arcosanti, his visionary community in the Arizona desert. By 1979, several modest structures had been erected along the edge of the mesa site, and Soleri was ready to undertake the more ambitious East Crescent, a mixed-use complex aimed at creating a lively and social community for residents.

The East Crescent Complex was designed to house 60 people in multilevel units arrayed in a half circle. Its central amphitheater was meant to double as a playground and marketplace. The vocabulary of curvilinear concrete forms characteristic of earlier Arcosanti structures gave way in the upper stories to lighter construction. Projecting concrete arms were designed to anchor a cable-supported canopy over the amphitheater. The complex was to be heated by warm air rising from a then-unbuilt greenhouse—which was intended to provide site-grown food—on the slope below.

Arcosanti's minimal use of resources won the approval of the 1979 P/A jurors, who were concerned with energy strategies and had found too few entries that "made the energy considerations into something architectural." Their enthusiasm for this project was tempered by "planning and formal systems" that they considered "unsophisticated."

Since construction of the East Crescent began in 1980, thousands of participants in Soleri's learn-and-build workshops have aided its realization. Yet today, even as Arcosanti's activities continue after its leader's 2013 death, the complex remains only 75 percent complete.

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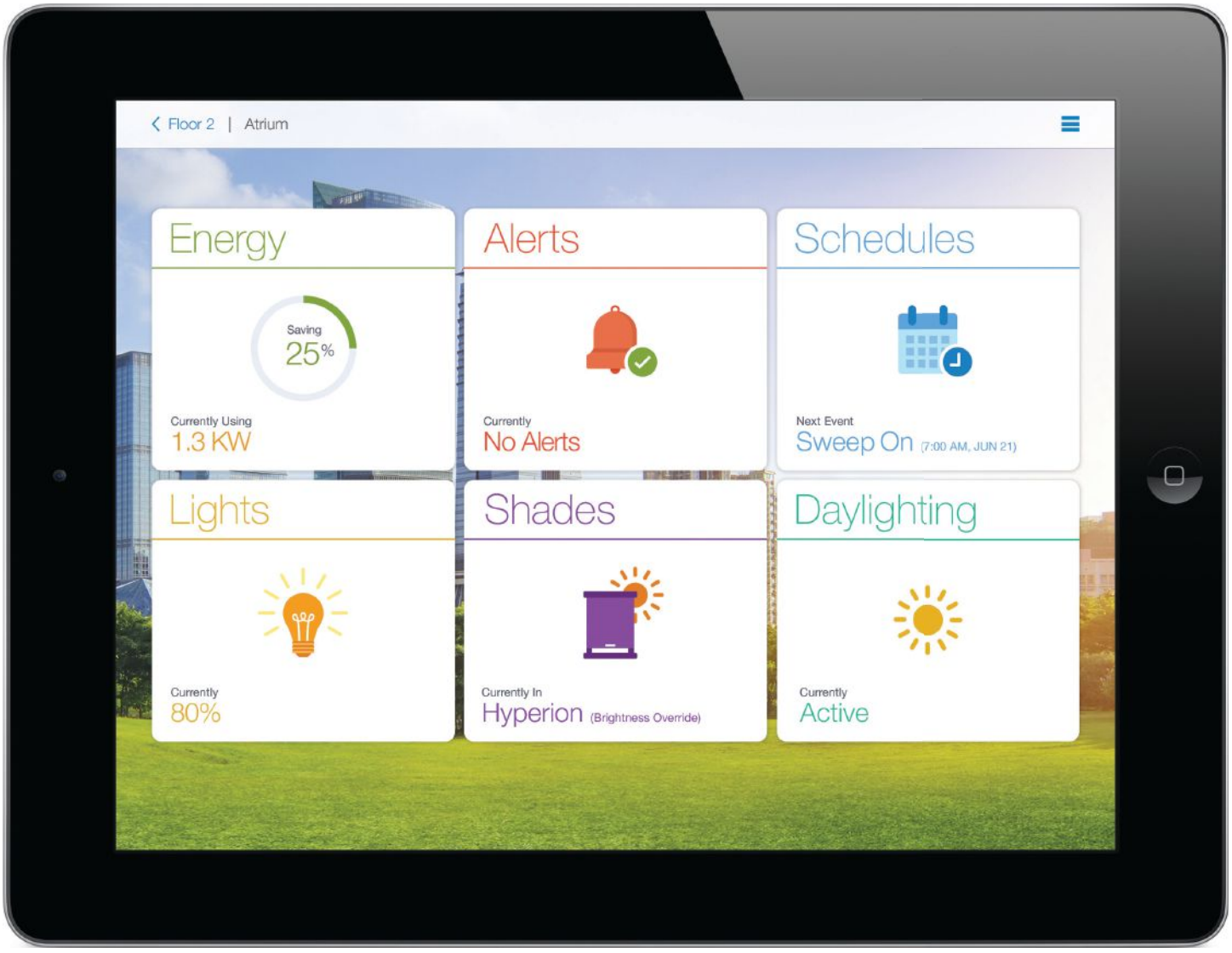

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