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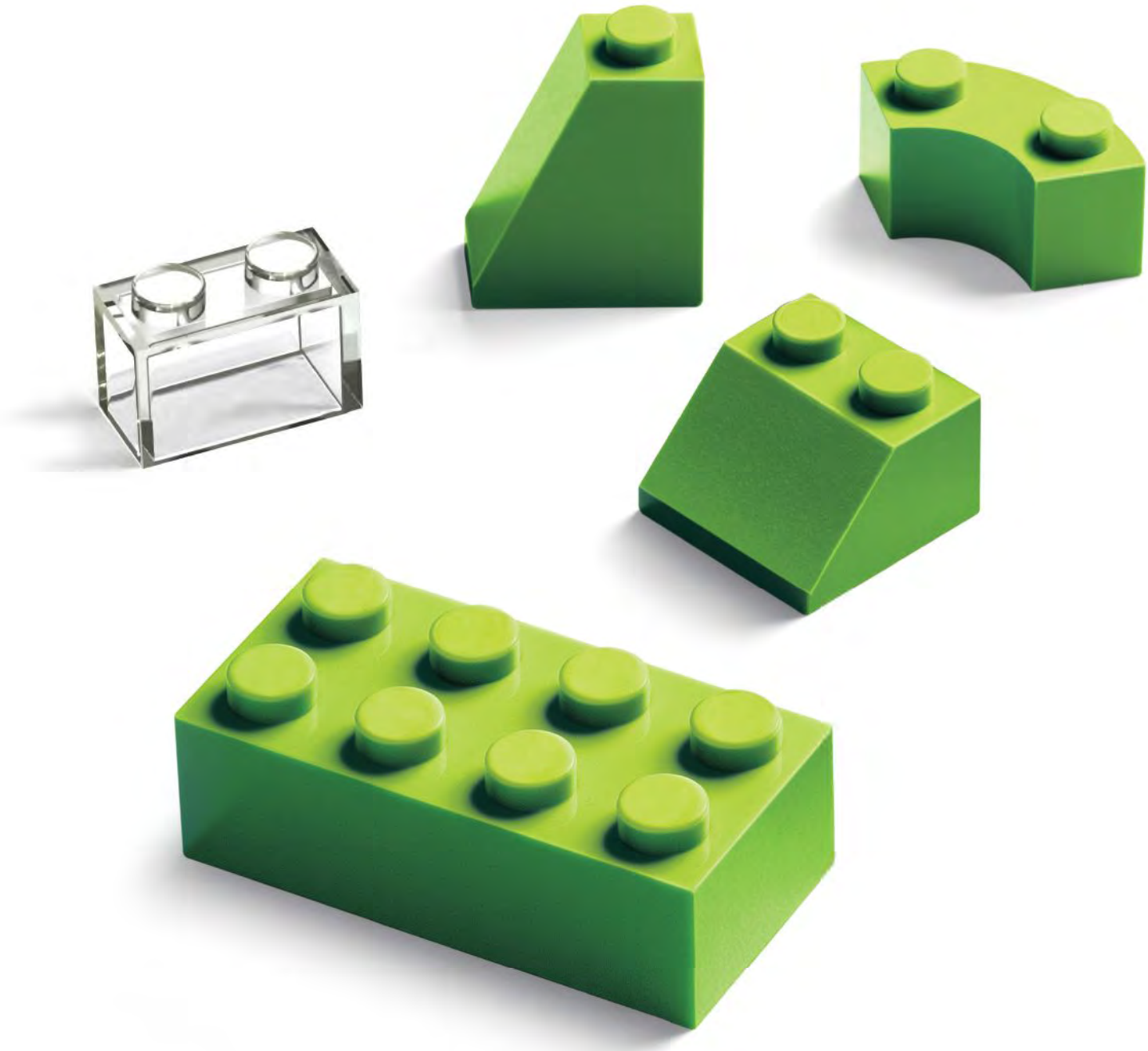

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Volume 105, number 10. October 2016.
On the cover: Shinsegae International in Seoul, South Korea, by Olson Kundig
photo by Kevin Scott

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1. Discuss innovations and futuristic objectives for using shade structures constructed with fabric in commercial architecture.
2. Explain how shade structures made of fabric can add both appealing design and functionality to building structures.
3. Define the benefits of shade structures for personal health and UV protection.
4. Discuss how the use of textiles in shade structures can positively impact thermal performance and energy efficiency.
5. List LEED credits to which awnings and solar shades can contribute directly.

Learn more about the future of shade by completing this continuing education course at sunbrella.com/fosceu

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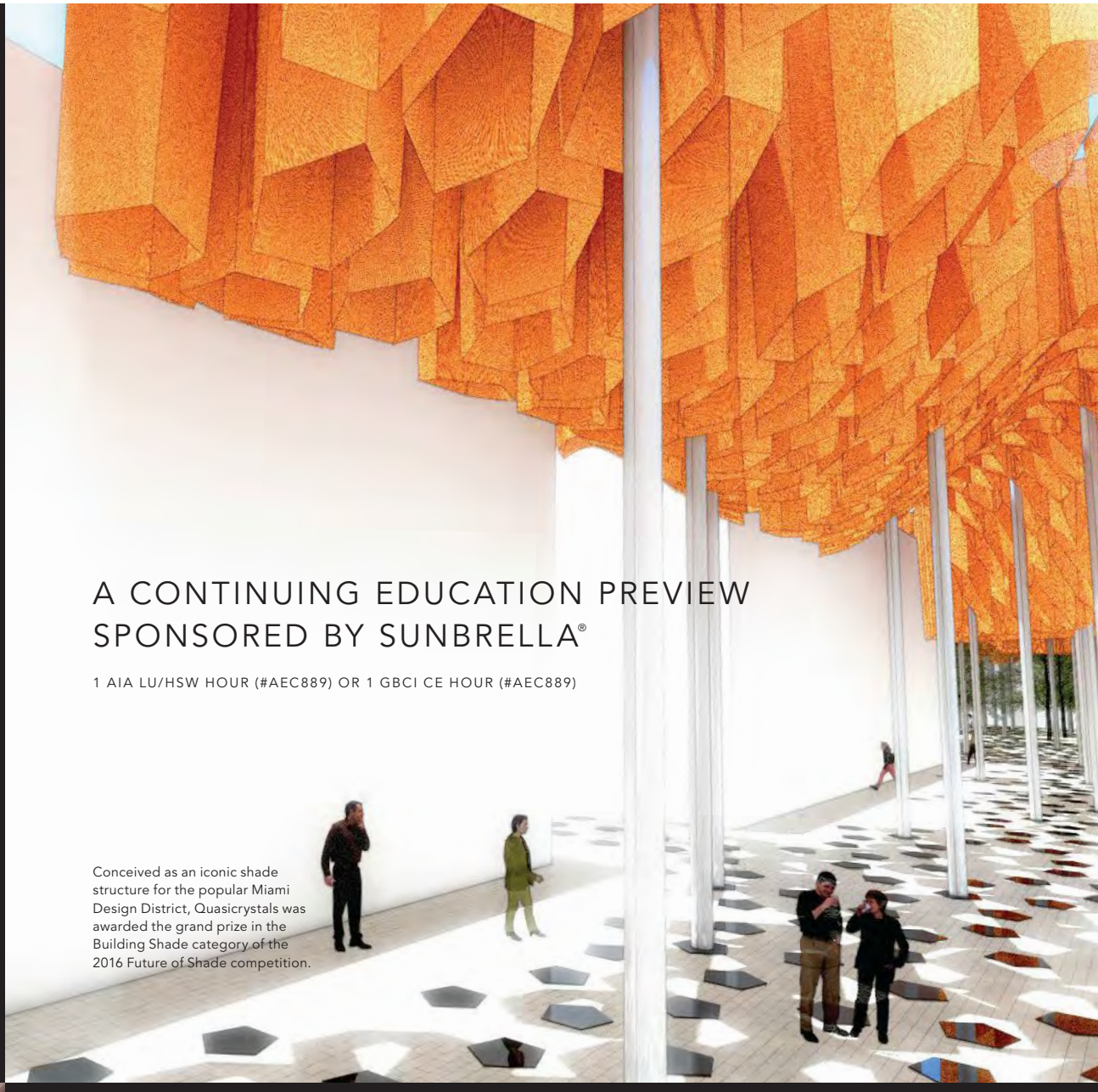

A CONTINUING EDUCATION PREVIEW SPONSORED BY SUNBRELLA®

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Conceived as an iconic shade structure for the popular Miami Design District, Quasicrystals was awarded the grand prize in the Building Shade category of the 2016 Future of Shade competition.

SHADE IS ARGUABLY ONE OF THE VITAL ELEMENTS IN MODERN LIFE, THOUGH NOT SOMETHING THAT TYPICALLY TAKES CENTER STAGE IN THE DESIGN DIALOGUE. UNTIL RECENTLY, FABRIC SHADE STRUCTURES WERE AN APPENDAGE TO A BUILDING, AN AFTERTHOUGHT, AN ACCESSORY.

A deployable school designed for refugee camps, REVOLVE, creates a free-flowing space that provides a balance between work and activity.

OF SHADE

FABRIC COMPONENTS IN SUSTAINABLE ARCHITECTURAL DESIGN

Increasingly, shade structures begin the design conversation. This is particularly so in commercial buildings, those in sunny climates, those which will inhabit a warming planet (this one), and by architects looking for new ways to create built environments in harmony with nature's forces. The future includes a conscious intention toward shade structures.

THE EVOLUTION OF SHADING FABRICS

In order to appreciate the future of shade and position oneself on the leading edge of this movement, it helps to review the past, the long history of using fabrics as architectural add-ons, and how the practice has evolved.

Prior to the 1960s, most awnings and shading fabrics were made of cotton canvas, which the sun broke down quickly. In 1961, the owners of one of the oldest, most respected fabric brands decided to change the nature of shading materials the company had been making since the 1880s. They replaced cotton with acrylic fibers and pre-extrusion pigments and offered an unheard-of warranty of five years. They were dubbed "performance fabrics."

In the 1970s, performance fabrics got the attention of boaters, and the outdoor furnishings industry exploded with these new, long-lasting yet pliable fabrics. In 1988, BMW became the first car brand to adopt this company's fabrics for its convertible models.

By the early 2000s, as the green building movement gained momentum with the U.S. Green Building Council's LEED rating program, more attention was paid to the sustainable nature of performance fabrics. As high-performing shade fabrics last longer, people use less fabric and thus generate less waste as compared to other fabrics that might fade, lose strength or give in to mildew and atmospheric chemicals. In fact, some fabrics can be recycled through manufacturer recycling programs, reducing impact on landfills.

SIGNAGE AND BRANDING WITH FABRICS

As the use of shading fabric continues its trajectory in modern architecture, its use as a business branding strategy spans the decades. Historically, a print canvas canopy over a cigar shop or beauty parlor signaled the establishment's presence to passersby. While that design practice continues today, modern corporate branding with fabric is often spectacular, with enormous printed banners moving in the breeze. They are a signal to passersby and even passing aircraft that business or cultural events are happening there. The colors of the shading fabric convey their own branding message, tying into the corporate, company, educational, or non-profit organization's identity.

EXPANDING SPACE

Shading strategies in corporate, cultural and residential settings create copious amounts of added space for meetings, gatherings, meals and leisure. While the cost of walls and a roof could be prohibitive, and most likely exceeding a particular lot's allowable square footage of structure, the addition of shaded "rooms" becomes a possible way to expand the amount of usable space. Fabric enclosures in commercial spaces such as restaurants can help boost profits by increasing the amount of outdoor seating available year round.

SHADE STRUCTURES FOR HEALTH AND UV PROTECTION

Protection from the sun has always been important to humanity, but never so much as it is in modern times, with holes in the ozone layer and the unprecedented speed at which our planet is warming. Whereas natural climate change occurs gradually, giving organisms the opportunity to evolve their own protections, the speed of this man-induced climate change requires man-made protections. Ideally, we don't want sunlight to be totally "on" or "off," and that is where UV-resistant shading fabric (as well as shade itself) comes into play.

Hanging Parasol Garden combines sun shading, illumination, water collection and climbing plants into one innovative shade system.

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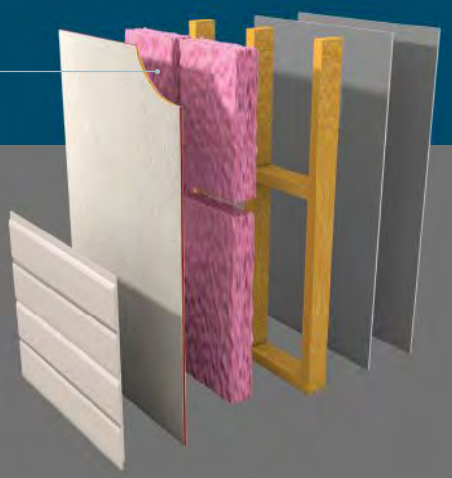

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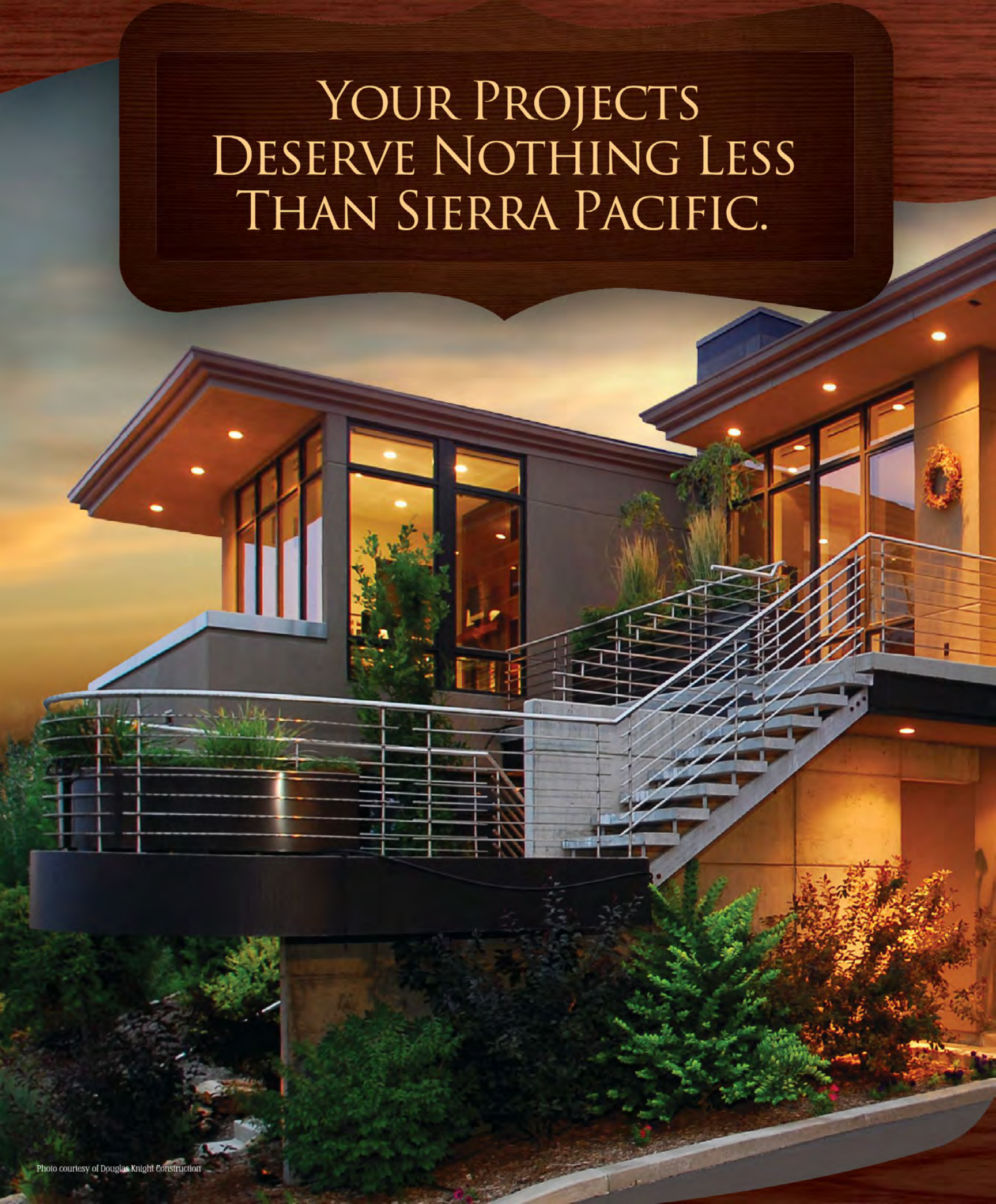

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GSA Commends Two Courthouses for Lifetime Achievement

Every two years since 1990, the U.S. General Services Administration's Design Awards have recognized outstanding federal buildings and their project teams. Eighteen projects were recognized with 20 awards and citations in the 2016 program, including two recipients of the new 10 Year Award, which this year honors buildings "substantially completed" in the decade of 1995 to 2005: the Lloyd D. George United States Courthouse (above) in Las Vegas, designed by Mehrdad Yazdani, ASSOC. AIA, of Cannon Dworsky (now CannonDesign), and the John Joseph Moakley United States Courthouse in Boston by Pei Cobb Freed & Partners. —SARA JOHNSON

> *Read about the other projects recognized in the 2016 GSA Design Awards at bit.ly/2016GSADesignAwards.*


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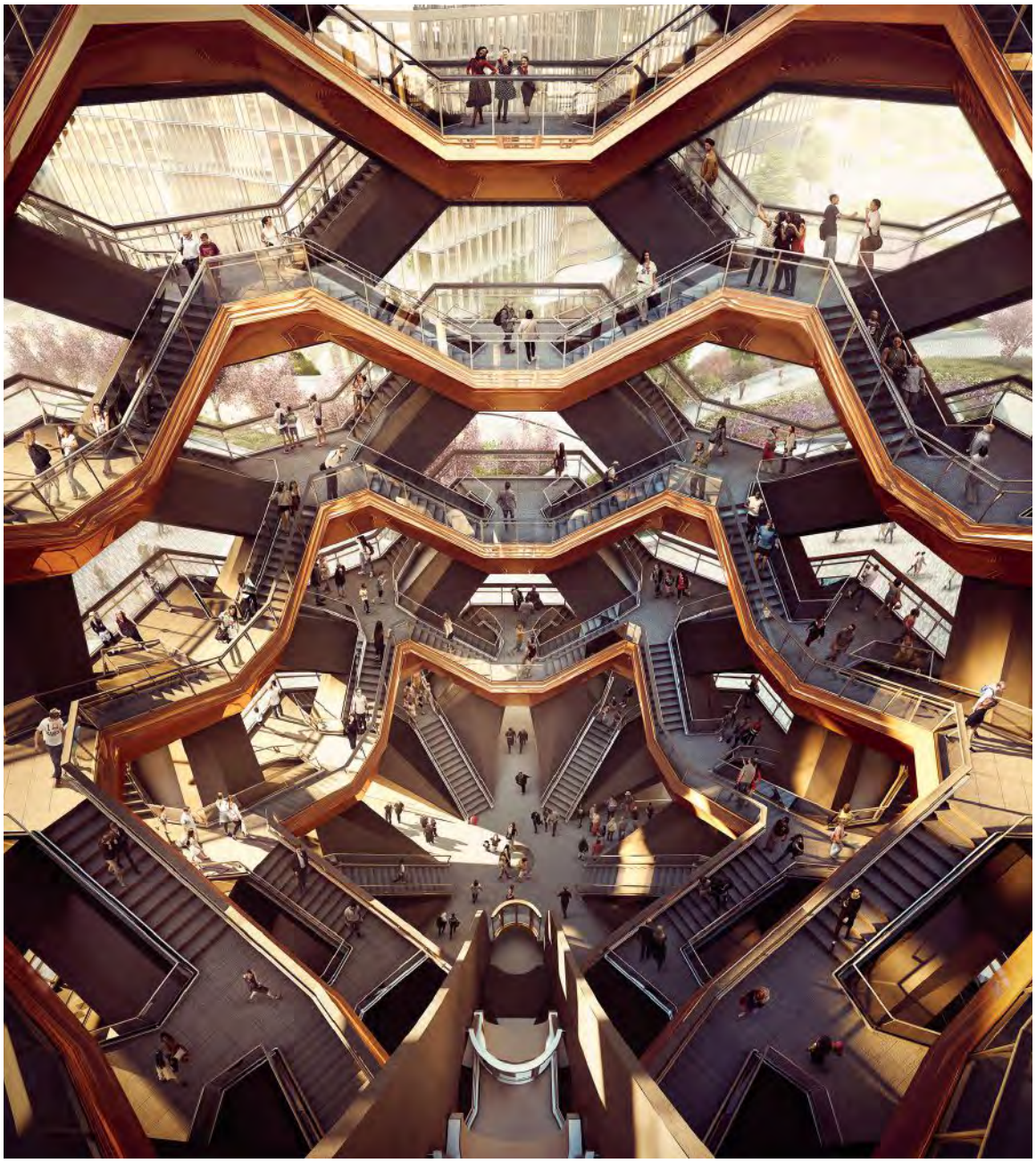

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An Escher-Like Creation for Hudson Yards

A bronzed-steel and concrete structure with proliferating staircases (154 in total) with stairs (2,500 of them) rising up from the ground to stacked viewing terraces (80 in all), the newly unveiled Vessel project by London architect Thomas Heatherwick is to be located at Hudson Yards, a mixed-use complex under construction in New York. The $150 million 15-story project will be erected as the centerpiece of a landscaped esplanade framed by a double phalanx of office and residential towers. Construction on the stairway is already underway in Italy, and the parts will be sent to New York for an anticipated opening in 2018. —JOSEPH GIOVANNINI

> *To learn more about the Vessel, visit bit.ly/HeatherwickVessel.*

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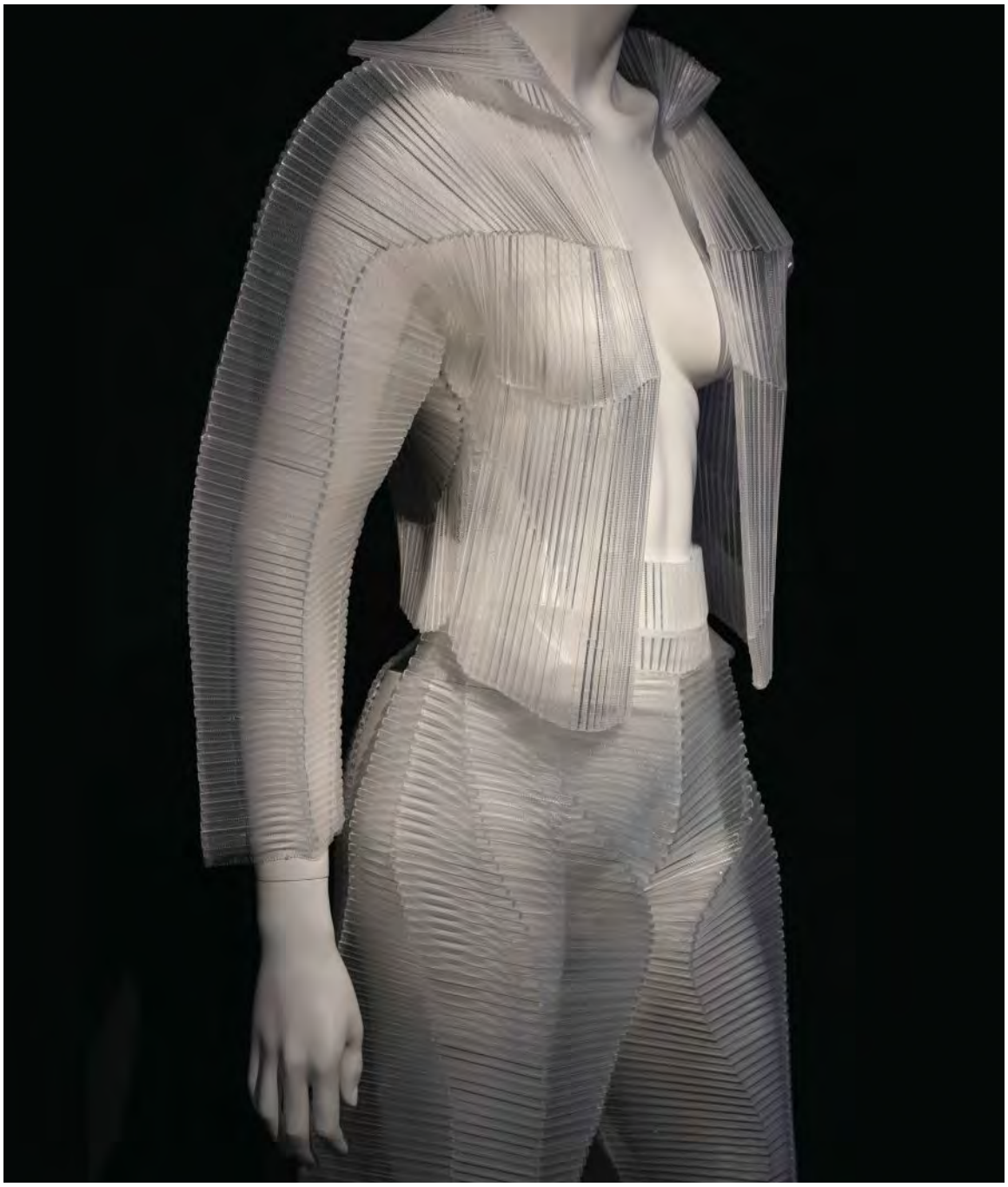

DAMIAN GRIFFITHS

Architecture for the Body

A new London gallery, Maison Mais Non, opened its inaugural show last month, which began as a project envisioned by the late Zaha Hadid and her firm partner Patrik Schumacher as a way to examine how designers and architects could utilize innovative technologies. Proposed as a collaborative workshop, "The Extraordinary Process" examines how fashion and architecture can benefit humans through new, experimental concepts and technologies, and features work such as a jacket and trousers by Krystyna Kozhoma and Zaha Hadid Design (above). The exhibition is open through Nov. 16. —SELIN ASHABOGLU

> *Read more about the exhibition at bit.ly/TheExtraordinaryProcess.*

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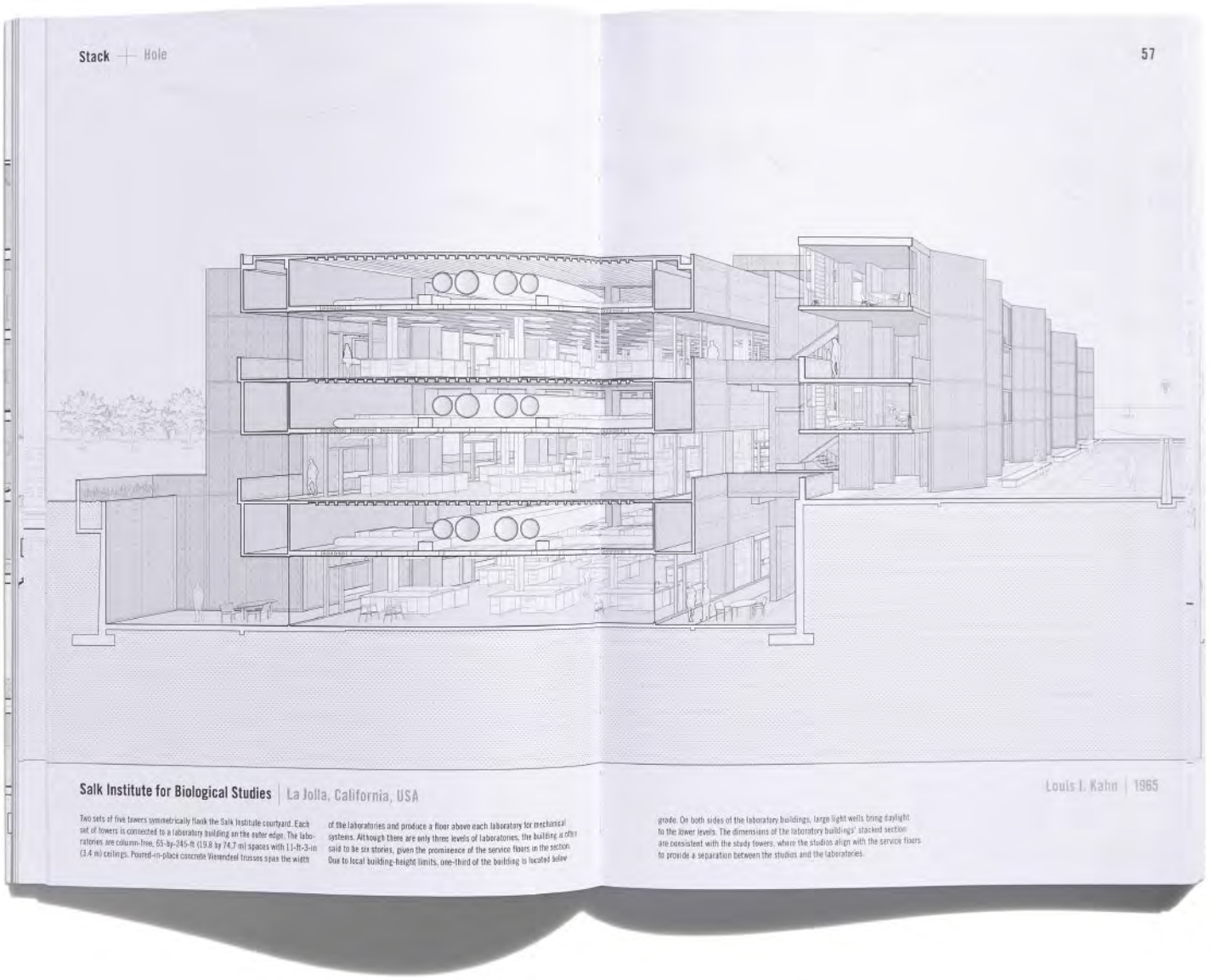

The Joy of the Section

A new book by the principals of New York's LTL Architects, *Manual of Section* (Princeton Architectural Press, 2016), is a paean to slicing through the building fabric. After an introduction and history, they dive into subjecting 63 buildings from the modern era to the pen's scalpel, opening up the objects of inspection with perspectives revealing the relations of space, structure, and form, in a sequence constructed as much by their choice of drawing location as it is by the actual buildings. As dessert, they offer some of their own designs, which hold up well after the servings of architectural derring-do that precede them. —AARON BETSKY

> *Read Betsky's complete review at bit.ly/BetskyManualofSection.*

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New Lab Opens in Brooklyn

An 84,000-square-foot technology and manufacturing facility, New Lab, opened in New York late last month. With room for more than 400 people and 50 companies, it is an amalgamation of many things: a co-working space for high-tech companies, fabrication and prototyping shops, and a gathering space to host workshops, seminars, and presentations for occupants as well as the public. Located in the Brooklyn Navy Yard, New Lab is one of four tenants in the 220,000-square-foot Green Manufacturing Center, which combines three former shipbuilding machine shops that had sat unused for decades. —WANDA LAU

> *To learn more about New Lab, visit bit.ly/NewLabOpens.*

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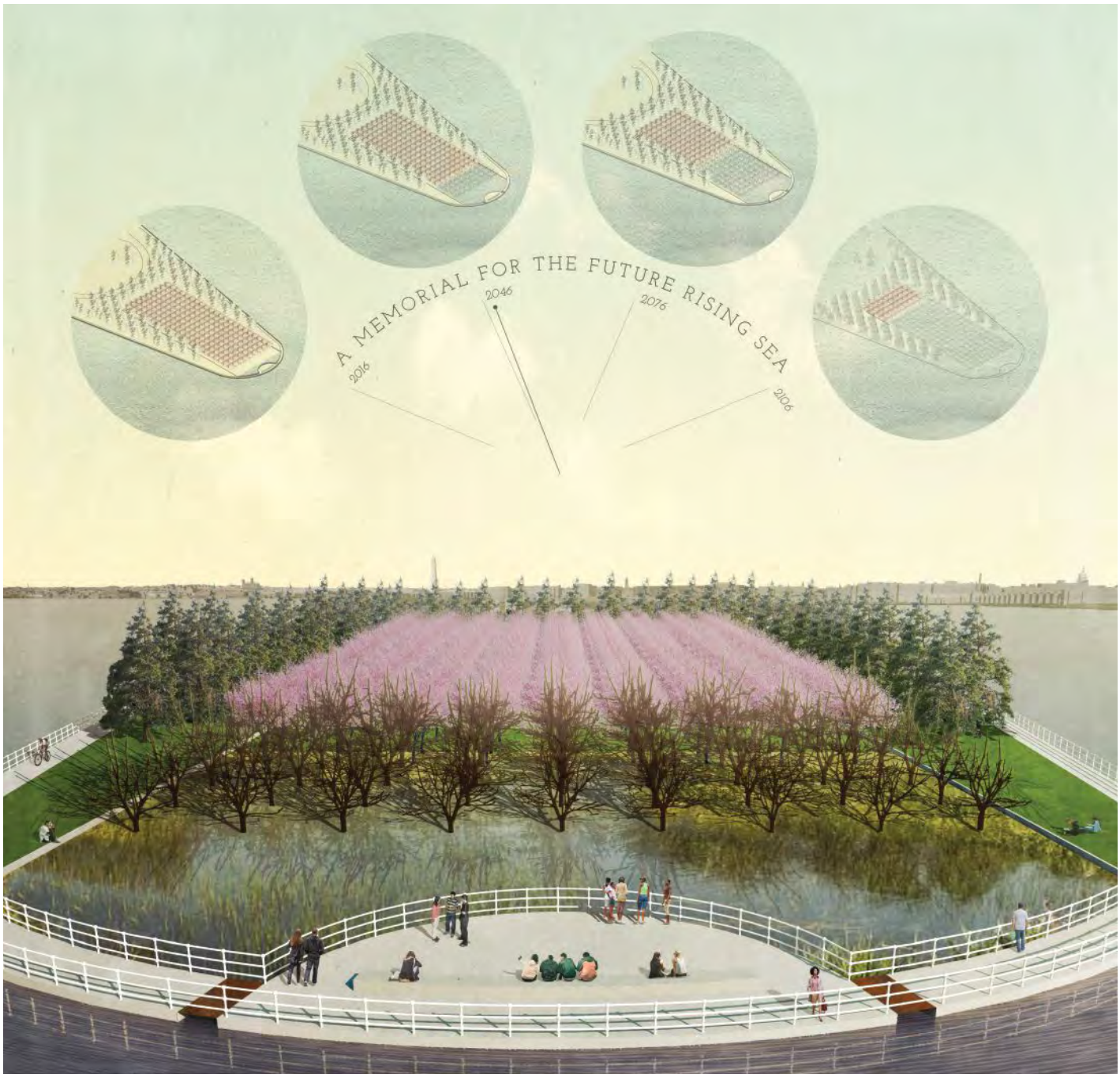

A Conceptual Memorial to an Inevitable Problem

Bay Area landscape architects Erik Jensen and Rebecca Sunter won the Memorials for the Future ideas competition—organized by the National Park Service, the National Capital Planning Commission, and the Van Alen Institute—for their concept, Climate Chronograph. The winning project represents the displacement of people due to climate change by planting a parcel of land in Washington, D.C.'s Hains Point with cherry trees that will perish as sea levels rise. An exhibition about the winner and finalists is on display at the John F. Kennedy Center for the Performing Arts through Oct. 20. —CHELSEA BLAHUT

> *Read more about the winning entry in the Memorials for the Future competition at bit.ly/ClimateChronograph.*

Sustainable Growth

The architects selected CF Architectural/Horizontal insulated metal panels in a variety of widths and colors to achieve a mosaic design on La Joya ISD's Child Nutrition Center and Police Station. Built to accommodate an increase in students, the structures incorporate sustainable design while the medley of colors emanates a youthful environment.

Visit **www.mbci.com/lajoya** for more information.

PROJECT: La Joya ISD Child Nutrition Center and Police Station

LOCATION: La Joya, Texas

ARCHITECT: Gignac & Associates

CONTRACTOR: Leyendecker Construction

PANEL PROFILE: CF Architectural/Horizontal (Brite Red / Snow White / Slate Gray)

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Best Practices: Engaging in Architect-Led Design/Build

TEXT BY NATE BERG

In the late 1980s, New York–based Peter Gluck and Partners Architects (now GLUCK+) landed a high-profile, high-stakes project: designing an addition to a 1955 Connecticut residence by Ludwig Mies van der Rohe. The project was "a great honor and responsibility," says principal Thomas Gluck.

It was also a lot of work. The firm didn't want any missteps so they watched the contractors closely during construction "without being compensated for it and without having the authority to direct the subcontractors," Gluck says. This experience led the firm to rethink how it handled its projects.

Understand the Delivery Method

For the past two decades, GLUCK+ has engaged in architect-led design/build (also called designer-led design/build), working as the single point of contact for the client, managing the project's design and construction, and subcontracting the construction to a general contractor, who in turn subcontracts to specific trades. Some firms may have an in-house construction arm that acts as the general contractor and construction manager, while others may hire a standalone general contractor to handle the construction.

> "There's definitely a greater opportunity to make more money."
>
> —Tom Vandeveer, AIA, senior vice president, HDR

Evaluate the Benefits

Change orders and cost overruns are uncommon in architect-led design/build projects, at least in Gluck's experience. Architects are more sensitive to cost, schedule, and material issues during design, and more attuned to addressing quality issues during construction. "The person who's designing [the project] is the person who is conveying it and working with the trades," he says.

Tom Vandeveer, AIA, senior vice president for global architecture firm HDR, says that financial case is clear for architect-led design/build delivery, which currently makes up about 10 percent of HDR's revenues. "There's definitely a greater opportunity to make more money," he says.

In a conventional design/bid/build model, an architect's total fee is between 6 and 8 percent of construction costs, which translates to about a 10 percent profit. Contractors pull in profits of around 15 percent. In architect-led design/build projects, those profits also go to the architect.

But, Vandeveer says, "the real motivator is more in being able to participate and, to some degree, control the design decisions that might otherwise be subordinated to a contractor," he says. Gluck agrees: "We can make sure all the subs on the site really focus on [the details]. We believe that it produces a much better piece of architecture."

Take the First Step

Firms may hesitate to lead a design/build effort because of liability issues related to construction accidents or failures. But, says Mark Friedlander, a partner who specializes in construction and design law in the Chicago office of Schiff Hardin, the risks are not much greater than what a typical architecture firm may expect to shoulder.

Construction problems typically would be covered by the general contractor's general liability policy. "If something is built wrong, the architect accepts full responsibility for it to the owner, but then passes down the liability or the responsibility for fixing it to the general contractor, who probably in turn passes it down to a subcontractor," Friedlander says. However, firms should set up a separate corporate entity to handle construction to insulate the architecture side of the firm if catastrophe does occur and the construction side has to dissolve.

Because the architect and the general contractor are working more closely together, Friedlander says the potential for problems is greatly reduced. "I structure my [clients'] designer-led design/build projects so that the architect and the contractor share savings and losses on a 50/50 ratio—which means that they know they're financially in bed together."

> *To read more about the architect-led design/build delivery method, visit bit.ly/ARLedDBld.*

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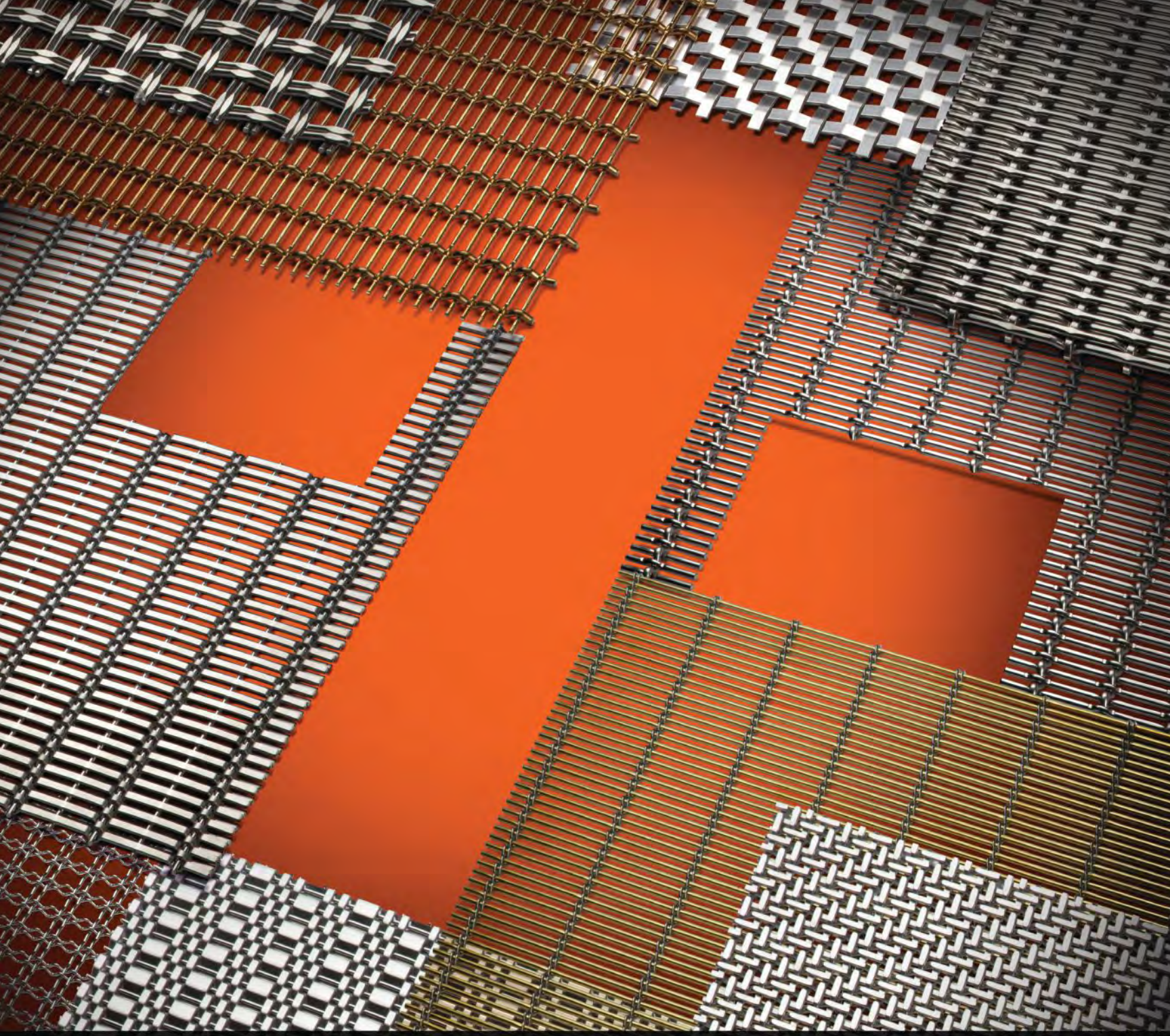

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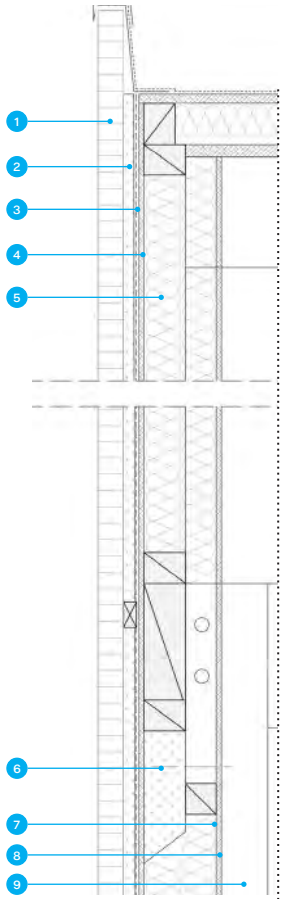
Detail: The Circular Pavilion

TEXT BY TIMOTHY A. SCHULER

The Circular Pavilion is anything but round, with the exception of its nearly 180 doorknobs. The skin of the 750-square-foot polygonal café and event space in Paris comprises a bevy of reclaimed doors, salvaged from a public housing project in the city's 19th *arrondissement*, to the northeast. Designed by local firm Encore Heureux and erected in front of City Hall, the temporary structure is named for the aspirational circularity of the life cycles of its building components.



1. Solid oak door, 38mm
2. 25mm × 50mm wood slat (60mm o.c.)
3. Waterproofing membrane
4. 9mm OSB sheathing
5. 70mm mineral wool insulation
6. Spruce frame
7. Vapor barrier
8. Reclaimed wood panel, painted
9. 100mm × 240mm Douglas fir post

Reclaimed materials make up 80 percent of the open, stick-framed pavilion with a sawtooth roofline and 20-foot-high ceilings. The firm enlisted municipal personnel into realizing the pavilion; for instance, maintenance workers and garbage collectors helped divert wooden chairs from the city's curbside furniture pickup service. "When we started, we had no idea what kind of material we would have," says partner Nicola Delon. Insulation came from a supermarket renovation. Baseboards were surplus from Rudy Ricciotti's MuCEM building, in Marseille. Light fixtures were exhumed from a warehouse owned by Evesa, the company in charge of lighting Paris.

And then there's the envelope of doors. In May 2015, Encore Heureux got a call from the city: It was removing 400 wooden doors from a 1936 housing project. Delon immediately went to see the doors. "They're perfect," he said.

His team devised a herringbone pattern, with each door angled 45 degrees. They also redesigned the building from their initial tent-like concept to have a trapezoidal floor plan.

Soon the pavilion will be deconstructed and moved to its new home on the Petite Ceinture, a former railway that encircles the city. Delon hopes it has left an impression on the city and people involved. "When you find ways to not waste, you find positive energy," he says. "Two centuries ago, we'd go to the forest. Now, we go to the city. It's a change in paradigm."

CYRILLE WEINER

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Next Progressives: Studio MK27

EDITED BY DEANE MADSEN

Location:
São Paulo, Brazil

Year founded:
In the early 1980s; the firm became Studio MK27 in 2001.

Leadership:
Marcio Kogan, HON. FAIA

Education:
B.Arch., FAU-Mackenzie
Master of Education, Society, and Culture, Escola da Cidade

Experience:
I was a film director until my first long feature in 1988, which bankrupted me. Then I had to content myself with being an architect.

Total staff:
20 architects and four other staff

Mission:
A microscopic collaboration for a better world.

Favorite project:
Like many architects would respond, the last finished one. I'm partial to Jungle House, in Guarujá, Brazil.

Second favorite project:
I have a very tender feeling for the Redux House, Micasa Vol B, and Studio SC, all in the state of São Paulo. Redux House has an interesting synthesis of materials and volumes; we made a movie there (*This Was Not My Dream*, 2014), and I had a lot of fun. Micasa Vol B was an advance in the studio's language—without any finishings, embracing the imprecisions of the process. Studio SC was a space designed closely with the client with a great amount of freedom, and a unique program that joined art and gastronomy, two things that I love.

Historic design hero:
I was in love with utopian architecture: American hippie Modernism, Archigram, Superstudio … Those were right up my alley. In reality they still are. I also admire the Japanese metabolists. I recently visited the Nakagin Capsule Tower in Tokyo, which is amazing!

After I graduated, I began to deeply admire Brazilian Modernism. It was difficult for me to understand how Brazil, a country that was completely isolated from the world at that moment, could produce such spectacular and iconic architecture, from the end of the 1930s until the beginning of the '60s, when the city of Brasília was inaugurated. I can't forget to mention Mies van der Rohe.

Modern-day design heroes:
I like the current Japanese architecture and numerous incredible architects like Toyo Ito, HON. FAIA, Kazuyo Sejima, Ryue Nishizawa, Sou Fujimoto, Takaharu Tezuka, Kengo Kuma, HON. FAIA, among others. I believe that they are inspired by Brazilian modernist architecture. And I also have great admiration for Herzog & de Meuron, Rem Koolhaas, HON. FAIA,


Marcio Kogan

and Richard Rogers, HON. FAIA. Realistically, I could mention 100 more.

Special item in your studio space:
The studio has thousands of objects filling up every empty corner. We have a collection of sketches and drawings that go from Le Corbusier to Oscar Niemeyer.

Design tool of choice:
A block of 100 sheets of tracing paper and a Staedtler .05mm pen.

Skills to master:
I still am left with the sensation that I need to learn everything.

Morning person or night owl:
I am a night person, but I have to wake up early every day for meetings, which turns me into a (yawning) day person.

Social media platform of choice:
I really like to read.

ROMULO FIALDINI

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Next Progressives:
Studio MK27

1,3: NELSON KON; 2: FERNANDO GUERRA

1,3. Cobogó House, built in São Paulo in 2011, features a lattice-like enclosure upon its roof. Comprised of tessellated 8-inch-square modules of white cast stone by Austrian-born artist Erwin Hauer, the screen fills the interior with dappled light. 2. Studio MK27 completed Redux House—a residence riffing on the Miesian archetype, in an environmental preserve in Bragança Paulista, north of São Paulo—in 2013. 4. The board-formed, reinforced concrete and operable wooden scrims of Vertical Itaim, a 10-unit apartment building in São Paulo completed in 2014, references the work of an acclaimed local architect, the late Lina Bo Bardi. 5. With the 2009 Paraty House, Studio MK27 designed two reinforced concrete boxes that cantilever from a hillside in the namesake beach town. Floor-to-ceiling sliding glass doors in the lower volume open the living room and kitchen to ocean views, while eucalyptus panels provide privacy and shade for sleeping quarters in the upper volume.

4: PEDRO VANNUCCHI ; 5: NELSON KON

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Technology: Innovations for a Worldwide Workflow

TEXT BY MICHAEL KILKELLY

Designed by global firm CannonDesign and Montreal firm NEUF Architect(e)s, the $1.5 billion, 3.6 million-square-foot University of Montreal Health Centre (CHUM, for Centre Hospitalier de l'Université de Montréal) is currently the largest healthcare project under construction in North America. Executing this massive private-public partnership, whose first phase wraps up next month, required CannonDesign to redefine its approach to BIM, project workflow and delivery, and staffing. Following are six lessons the firm shared.

1. Get Everyone on the Same Page
Nearly 180 architects across 15 offices worldwide have worked on CHUM. The team set strict protocols on everything from email correspondence to building reference details in the Autodesk Revit model. "It wasn't going to be enough to just design the building," says Christie Cavataio, CannonDesign senior vice president and CHUM senior project manager. "We needed to design the workflow as well."

2. Leverage your IT Infrastructure
CannonDesign leased space from a data center to host project data, run project software to minimize latency, and to avoid complicated file transfers (it purchased its own servers and workstations). As a result, its IT department could complete updates to software and hardware at one location. And as teams in North America were ending their workday, teams on the other side of the globe would be starting their day and could use the same hardware and software licenses.

3. Treat BIM as a Centralized Database
Healthcare projects deal in repetition, with corridors of identical rooms. The design team leveraged CodeBook, a database application in which users can identify "exemplar" rooms, such as CHUM's 442 exam rooms, 39 operating rooms, and 772 single-bed patient rooms, whose equipment and requirements can be batch applied to all corresponding rooms.

4. Use the Right Tool at the Right Time
The project team used PDFs for internal communications, editing shared documents with Bluebeam Studio. To illustrate design and coordination issues, the team used Autodesk Navisworks, which allowed them to walk user groups virtually through the center in first-person perspective to show that patient sight lines would be maintained.

5. Keep on Training
Consistent training is essential for maintaining the integrity of project protocols, Cavataio says. Designers—and even project managers—joining the team completed a full week of training and job shadowing before they were allowed to touch the Revit model.

6. Don't Forget Face Time
While technology was essential for the different offices and firms to communicate, it doesn't supplant face time. CannonDesign regularly rotated staff members from the 14 remote locations through its Montreal office and scheduled in-person training sessions. "Don't discount the value of technology," says vice president Matthew Forman, AIA, "but nothing beats a face-to-face conversation."

University of Montreal Health Centre, also known as CHUM

CANNONDESIGN + NEUF ARCHITECT(E)S

> *For more information about the strategies CannonDesign and NEUF Architect(e)s employed on this project, visit bit.ly/ARCannonCHUM.*

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Maxine Ward, AIA LEED AP Associate
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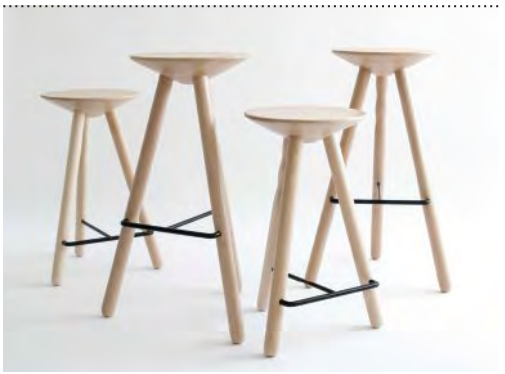
TEXT BY SELIN ASHABOGLU

Barstool 7, Stillfried Wien
At 43" tall, this solid wood barstool by Croatian studio Grupa is treated with natural oil and wax, and uses vinyl-based glue. Available in six finishes, including maple, cherry, and walnut. *stillfried.com*

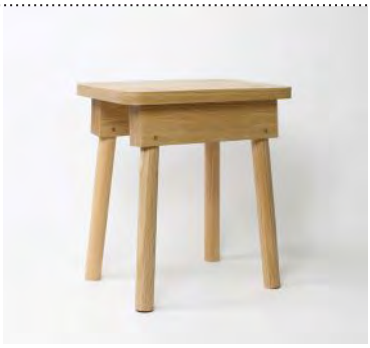
Drift Tall Stool, Council
By San Francisco–based studio Branch for Council, this minimalist stool comes in natural ash and four painted finishes (blue, shown) with a steel or brass footstool. *councildesign.com*



Luco, Martin Azua
Spanish designer Martin Azúa made this turned-wood beech stool using CNC technology. For high-traffic applications, Luco comes in three heights: 17.7", 23.6", and 29.5". *martinazua.com*

Rustic Stool, Mark Laban
After entering the wrong settings on a CNC-milling machine, British designer Mark Laban leveraged the glitch to form Rustic. The solid maple stool is 17" tall, 13" wide, and 30" long. *marklaban.com*

Squaretown Stool, Hollis+Morris
Two skewed pyramids morph into each other's apexes in these stools by Toronto-based studio Hollis+Morris. Available in walnut and oak with natural, white, and black (shown) finishes. *hollismorris.com*



Brace Stool, Dino Sanchez
A solid oak body and legs firmly plant this elementary school–inspired stool on the ground. Designed by New York–based studio Dino Sanchez, Brace is 17.5" tall, 16" wide, and 11" deep. *dinosanchez.com*

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Q+A: Daniel Wiens, Journeyman International

TEXT BY WANDA LAU

At the behest of his parents "to go to college and do something," Daniel Wiens enrolled in California Polytechnic State University's construction management program after working for a contractor in Bend, Ore. For his undergraduate thesis, he designed and built a dental clinic in Independence, Belize, through Global Outreach Mission. This "phenomenal" experience, he says, fulfilled his degree requirements and gave a charitable organization free labor.

And so the model for Journeyman International (JI) was born. In the following interview, Wiens, who founded JI in 2009 and serves as president, talks with ARCHITECT about what makes his nonprofit organization such a distinctive humanitarian design entity.

What makes JI's model unique?
Our niche was to tap into the academic world and students studying architecture, engineering, or construction with thesis projects. Some of those students are now in industry and licensed, forming an alumni network. Our student program is almost more of a training program to inspire young people. If their thesis project gets designed and built, it's the cherry on top.

Who reviews the designs?
We have several layers of quality control before projects are built. A student designer will have their professor as well as the JI team, which also reviews projects. We also pair every designer—whether they're a student or not—with a mentor, typically a licensed professional near them who they can meet with weekly or so. Then we partner with an organization in the project's country that knows the materials available and what's culturally appropriate. On top of that, we run all of our drawings and designs through a local architect and engineer.

How does a student get involved?
We don't accept all students; they have to apply, and submit résumés and portfolios. Our criteria for selecting designers is two-fold: One, we want highly talented people; and two, [they must have] a genuine heartfelt passion for humanitarian work.

I ask students to talk to their professor and their department head. Basically, a JI project has to fit into an existing curriculum. If it doesn't match and it's not a good fit, then we just don't do it. We also collaborate with AIA Students to run a design competition we call the "Humanitarian Design-A-Thon."

If firms want to get their staff involved in directly doing projects, we welcome that. We also worked with AIA San Francisco and NCARB to create the JI Emerging Professionals program, which lets designers earn IDP [now AXP] credit for volunteering with JI projects.

How is JI, a 501(c)(3), funded?
The primary funding source is through corporate sponsors. We go to AEC companies, show them what we do, and request that they sponsor the design development of a specific project. Oftentimes that company becomes the mentor for that project.

I'm the only JI employee, so I collect a salary from our sponsors. That helps support my time in putting together project logistics, provide money for travel, and things like site surveying or soil testing for a project. The money also goes toward general business expenses and helping students travel.

What are JI's greatest needs?
We're actively seeking new projects, as well as people who want to volunteer their work, time, and energy—and then also sponsors. Many firms love doing humanitarian work, but coordinating the logistics can be time-consuming. My company makes that easy for them, so that the firms can just get to work. The pitfall for me is finding enough projects. There's a lot of people willing to volunteer, which is a nice problem to have.

Journeyman International, by the Numbers

72	17	35	200+	6	350+
projects designed or in design	projects built or in progress	countries in which JI has worked	professional or student volunteers	Participating universities	locals hired to construct projects

> *To read the full interview with Daniel Wiens, visit bit.ly/ARJourneyman.*

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AIA Architect

AIAVoices

PHOTOGRAPHY: FRANCESCO SAPIENZA

The Production of Life

Traversing the intersection of real and cinematic.

Charles Renfro, AIA, constructs experiences. He is a partner at New York City–based Diller Scofidio + Renfro, a firm that has integrated the arts and architecture like few others. That intersection between tangible and cinematic is on display in *Diller Scofidio + Renfro: Reimagining Lincoln Center and the High Line,* a film about two of the firm's more prominent urban projects that premiered at the Architecture & Design Film Festival in 2012 (directed by Muffie Dunn and Tom Piper). Here, Renfro makes a case for architecture and film's inextricability.

As told to Steve Cimino

Because the High Line is a linear park, there's a prescribed path that a person would take through it that is similar to how a camera might experience it; there's a direction, and a narrative unfolds. The space itself becomes a kind of character, a protagonist or antagonist in the production of life, thereby turning an everyday experience into a kind of filmic experience. Generally speaking, there's no set way to experience a project or a building, but if the work is good you will get people to think and feel something new. That's really what we're after.

We began our careers as architects working in the art world. Often that led us to performance, theater, dance, and filmmaking—areas where we could control a point of view and deliver a predictable way.

It's how we became interested in interrogating the culture of the everyday. We've also tried to interrogate the art forms themselves: the art of cinema and the space of the theater with its fourth wall. We're interested in poking holes in typologies to let new experiences emerge. And we've tried to take some of those theatrical approaches into our architectural work over the past 15 years.

Film is interesting [but] a documentary film about architecture can never convey the actual experience of being there. And, any film with an edit has a point of view. It can't simply be an index of a place. Yet a film does explain something better than a still can. A still, by nature, removes so much visual information that it cannot fully explain a place, not to mention time. Film can start to overcome that.

Architecture and film are both art forms that are acquired or apprehended through time and space. In architecture, your body is moving through the space; movement and direction and time add up to make a kind of cinema. In film, the camera is moving. More than any other art form, the connections are direct. AIA

For more on the 2016 Architecture & Design Film Festival, visit *adfilmfest.com.*

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AIANow

By Steve Cimino
Art Direction by Jelena Schulz

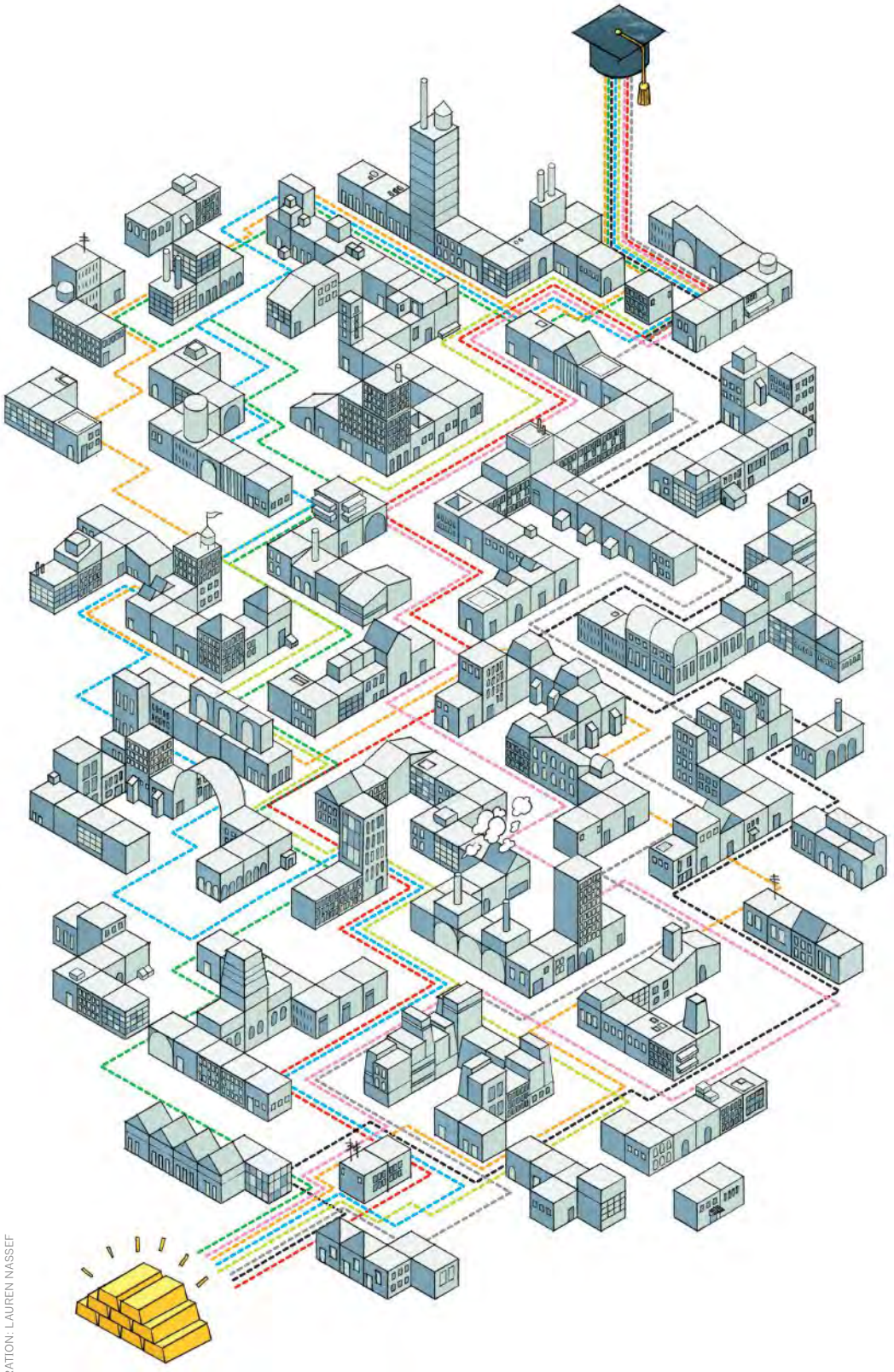


ILLUSTRATION: LAUREN NASSEF

Choose Your Own Adventure

As part of its new StudyArchitecture.com initiative, the Association of Collegiate Schools of Architecture (ACSA) has outlined eight career paths for architects who have obtained their degrees—a far cry from the former binary choices of "architecture" and "other." Here, we examine what each of these eight paths has to offer an emerging professional about to take his or her next step.

ARCHITECTURE: The traditional option, although becoming a licensed architect allows for various areas of expertise, such as project management or building codes.

DESIGN: Take the more visual elements of your architectural training and employ them at an advertising agency or urban planning firm.

COMMUNICATIONS: Architects have to collaborate and communicate in order to succeed; those skills are always a major plus in both public relations and human resources.

COMMUNITY BUILDING: It's difficult to be a working architect today if you aren't plugged into your community. Management and design positions in community initiatives abound.

TEACHING: Bring the lessons imparted upon you to the next generation; an architect's communication and project management skills translate well to the educational world.

MAKING: Use your design abilities in a hands-on fashion; construction and carpentry are a bit more physical but rooted in the same methodologies.

MARKETING: A variety of clients, detail-oriented work, and visionary thinking that leads to beautiful design? Marketing is basically architecture with more writing.

POST-PROFESSIONAL STUDIES: Why start a job when there's more to learn? Head back to school, either for architecture or a related field of study, and narrow down your future path even further.

To learn more about the ACSA's new initiative, visit *studyarchitecture.com*.

AIAFeature

Design's Vanguard Moved to France

Two architects write design/build's next chapter abroad after making an indelible mark on their students and colleagues in the U.S.

By J. Michael Welton

PHOTOGRAPHY: DAVID CARLIER

Architects and educators Marie and Keith Zawistowski have been instrumental in supporting France's new legislation to make design/build a legal delivery method. They have also broken ground on a design/build workshop in Villefontaine, outside Lyon, where they will blend practice, research, and teaching to train a new generation of architects.

The Zawistowskis learned lessons about creative problem-solving on a budget at Auburn University's Rural Studio in 2001 and 2002, which has led the couple to a highly coveted French architecture prizes—and the opportunity to reintroduce design/build to a new generation of French architects.

From 2008 to 2015 they developed those lessons for Designing Practice, a class they co-taught as the first professors of practice at Virginia Tech's School of Architecture + Design, which garnered a National Council of Architectural Registration Boards prize for curricular rigor and application. While distinct, Designing Practice was aligned with another course they taught: a design/build lab for third-year architecture students.

"Rather than teaching students how practice works, we taught them that their future is a design challenge like any other—that they should be as creative about their approach to practice as they are about the buildings they design," Keith says.

Scott Poole, FAIA, former director of architecture and design at Virginia Tech, likens the pair to the fervent young founders of Modernism in the 1920s. "They're unusual in the sense that they operate at a high level in how they negotiate difficulties and get the public excited about their work," says Poole, currently dean of the College of Architecture + Design at the University of Tennessee. "They are high-level professionals at a very young age."

The Lucy House

These two thirtysomethings met at Rural Studio as part of a team of six students working on a project that became known as the Lucy House, for the woman who would live in the home they designed and built. "Lucy had been living in a shack, a house with no running water," Keith says. "There were two things she asked for: a place to pray and a storm shelter."

She got them both—no problem. The team poured a concrete basement for a shelter and designed her bedroom as a chapel, with a skylight for its only window. They created walls made of stacked carpet tiles salvaged from office buildings and donated by Interface Americas, the world's largest modular carpet manufacturer.

"It was life-changing; it transformed her life, and it transformed our life, too," says Marie, a native of Paris who studied at the Ecole Nationale Supérieure d'Architecture Paris-Malaquais before crossing the ocean to experience Rural Studio. "As architects, it was incredibly empowering. We made a positive impact on the world around us."

Theory into Practice at Virginia Tech

After graduation, the pair followed up with more residential design/build projects out of the practice they called onSITE, including a rammed-earth house in New Mexico; a farmhouse in Covington, Va.; and an addition to a cabin in Stuart, Va. Their strategy was to take on one project at a time, and ended up having a three-year waiting list. "Clients that are willing to wait are good clients," says Marie. "They're patient."

From onSITE, they created a design/build teaching initiative to engage students at Virginia Tech in nonprofit community-service projects. They called it design/buildLAB, and blend creative problem-solving, fundraising, design, and hands-on construction. In essence, they urged students to create the conditions where architecture can succeed, and with them they've established a legacy of civic architecture in southwest Virginia.

"They brought an educational dimension that subsequently generated a 'service to Appalachia' component," says Jack Davis, FAIA, Virginia Tech's Reynolds Metals Professor of Architecture and dean of the College of Architecture and Urban Studies. "Their greatest impact was making a connection through design education to a community in need."

For Virginia Tech students, the pair were also the source of an infectious entrepreneurial spirit. "It was like, 'Take this project and own it from concept to realization,'" says Virginia Tech graduate Brent Sikora (class of 2014), now working at HKS Architects in Richmond, Va. "They bring a passion to what they're doing, and it rubs off on all the students."

The pair takes an artisan's approach to their teaching. "We like to work with our hands," Marie says. "We know it's important for them to see the process. As a consequence of the way they draw, they will be better architects."

AIAFeature

CONTINUED

Students in design/buildLAB managed a budget while learning to value local resources, context, craftsmen, and precedents. They were taught to consult with community leaders and prioritize projects—and line up for funding from grants or sponsors.

They did that first in Covington, where they designed and built a new permanent farmer's market downtown. A year later students created an amphitheater in Clifton Forge, Va., following up with a bridge that serves as connective tissue between two sections of downtown. Both projects spurred revitalization, and two more classes designed and built a Little League fieldhouse and community ballpark.

"They were enormous ambassadors for the value of architecture and architects," Keith says. "Consensus and momentum were extremely important; they organized the community around them, and then gave hope to that community."

Two Prizes in Paris

The couple's work did not go unnoticed, especially in Paris. By April 2014 onSITE had won the prestigious AJAP, or French Young Architects' Prize. In November 2014 the firm won the Prix Françoise Abella from the French Académie des Beaux-Arts. Members of the juries for both prizes cited onSITE's "achievements in practice and in teaching."

The irony is that their design/build work in the United States had triumphed in a country where it was against the law. "We talked to representatives from the minister of culture, and said that we're doing it in the U.S. because it's illegal in France," Keith says, "But its roots are in France, from the origins of the profession through the time of Garnier."

"They bring a passion to what they're doing, and it rubs off on all the students."
—Brent Sikora

TOP: After leaving Virginia Tech, the Zawistowskis moved to Soleymieu, a the late-medieval era stone village outside of Lyon, to raise their family.
ABOVE: At Les Grande Ateliers in Villefontaine his fall, the Zawistowskis begin teaching design/build to architecture students from Lyon and Grenoble.

That's Charles Garnier, who designed and built the Paris Opera, or Palais Garnier, from 1861 to 1875. That lavish Beaux-Arts structure served as a model for 19th-century design/build. Garnier actually built a temporary office on site so he could collaborate with artisans as they executed his design.

It was a practice that would not last in France. In 1895 the Code Guadet, the first French code of ethics for architects, declared the architecture profession a servant of the public interest, incompatible with that of a contractor, a servant of commercial interest, and in 1940 that code was written into law. But by 2014 an economic crisis, along with a diminishing role for architects, were calling the law into question. Attitudes were beginning to shift. "Public commissions had long been the lifeblood of French architecture, but the money for large social projects has dried up," Keith says. "Adapting to this new reality has literally become a matter of survival for the profession."

When the Zawistowskis won their prizes, architecture in France was on the cusp of change—and the couple would be influential in helping to guide that change. "The question was, 'How do we make sure that the law allows young architects to shape the future of their own profession?'" he says.

One answer was the French minister of culture's creation of a "National Strategy for Architecture," a series of cultural and political initiatives for legal changes that favor architects and architecture. The first phase was the creation of three committees with names derived from action verbs: Innovate, Sensitize, and Develop. Each was co-chaired by a late-career winner of the French Grand Prize in architecture and an early-career winner of the Young Architects Prize. "There was one person who'd been around a long time, and one with an ideology of how architecture could be," Marie says.

She represented onSITE on the Innovate committee. "Our work here was definitely an important reference," she says. "It showed the value of what we were proposing." Out of that committee came measures designed to pave the way for initiatives similar to their Designing Practice course and design/buildLAB.

In fall of 2015, the pair left Virginia Tech and headed for Paris to help shape laws and policy, and to initiate design/build in teaching and practice. They visited with friends, colleagues, school directors, and faculty, exhibiting their work and giving lectures, seeking to identify an entry point for design/build in the public architecture school.

ABOVE: The Zawistowskis and Michel-André Durand, the director of Les Grands Ateliers, discuss a prospective collaboration between students and artisans. BELOW: Marie and Keith with Romain Anger, the scientific director of Amaco, a material research institute within Les Grands Ateliers.

One result of the three committees' work was that the French legislature revisited its architecture laws and revised them. It inserted a new clause that allows for exemptions that enable demonstration projects that might include the concept of design/build. That legislation passed this July.

Creating Dream Jobs

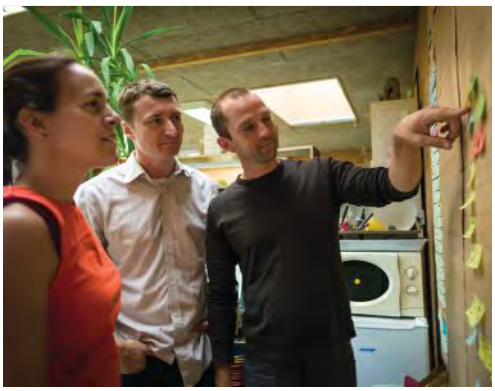
One of the couple's favorite teaching points for students is that their dream job doesn't exist: They have to create it. In France they've taken their own advice, moving both themselves and onSITE to the little stone village of Soleymieu near Lyon and Les Grands Ateliers (The Big Workshops), a resource that Patrice Doat, a giant in French architectural education, was instrumental in creating. They've worked with that resource, one shared by all French public architecture schools, to identify partners and raise funds to create teaching positions for themselves. "The schools of Lyon and Grenoble are each contributing half of one of our salaries," Marie says. "The regional government is contributing the other halves."

So this fall they'll be teaching a group of about 40 first-year master students from Lyon and Grenoble at Les Grands Ateliers. That first group of design/buildLAB students in France will be assigned a one-of-a-kind exercise in creative problem-solving. "They'll design and build the Co-Creation Lab, which will serve as the base of future public interest design/build student projects," Keith says.

The 5,000-square-foot structure—with lab space, research offices, and an auditorium—will be sited next to the existing 15,000-square-foot Grands Ateliers, a building prefabrication space large enough to accommodate the fuselage of a commercial aircraft. If their impact at Virginia Tech and Appalachia is any indicator, the French architecture students soon will be engaged in groundbreaking architectural experiences. The Covington farmers market earned a 2011 Design Excellence Award from AIA Virginia, and it was not just a one-off community success. It was followed by four more student-led projects in Clifton Forge.

"That whole community of Clifton Forge now values modern architecture in a way some cities don't, because they saw the value Keith and Marie brought to their community, with the amphitheater, the bridge, and the ballfield," says the University of Tennessee's Poole.

Et voilà! The pair recently incorporated onSITE for practice in France, which means that now, to paraphrase F. Scott Fitzgerald, anything can happen—anything at all. AIA



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Six Design Decisions Your Clients Will Thank You For

People spend 90 percent of their time indoors, and much of that time is spent at the office: an average of 47 hours per week. From lighting, to acoustics, to how much time we spend sitting, employees' workplace experiences can impact their mental and physical well-being, even after they leave the office.

The good news is design decisions can increase health and happiness at work, and mitigate negative consequences of environmental stressors. According to Stanford University researchers, the effects of workplace stress are comparable to those of secondhand smoke. Long workdays and short deadlines contribute to long-term increased risk of cardiovascular disease, along with depression, anxiety, and short-term losses in productivity at work and at home.

Potential design clients are taking note. Nearly half of U.S. companies are investing in workplace interventions to mitigate stress and improve well-being, including redesigning where we work. The WELL Building Standard and other emerging evidence-based tools and standards help architects design spaces that reduce stress and enhance physical and mental well-being. On the next page, you'll find three common workplace stressors and six evidence-based strategies that can help clients promote health and reduce costs.

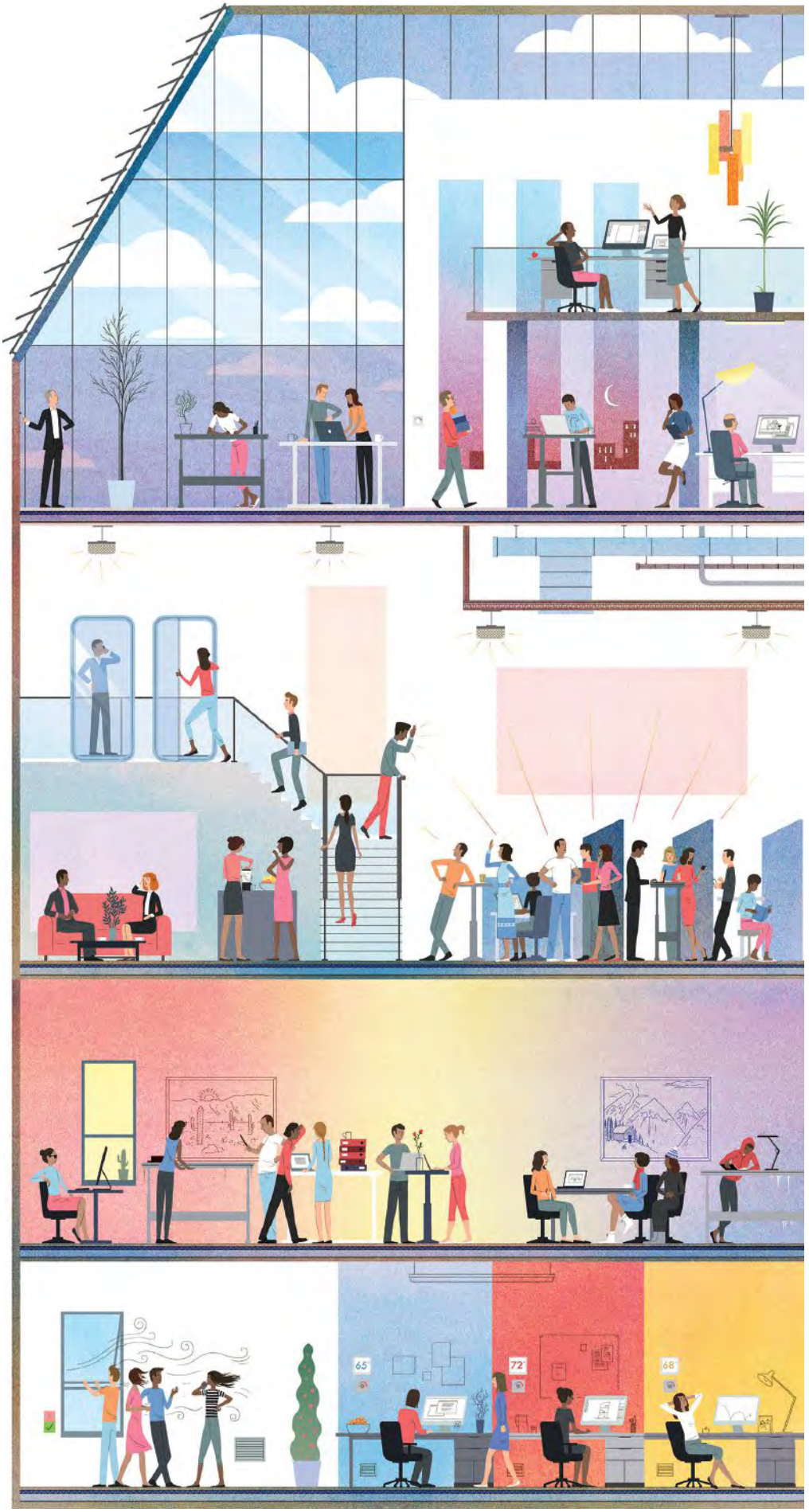

ILLUSTRATION: MICHAEL KIRKHAM

AIAFuture

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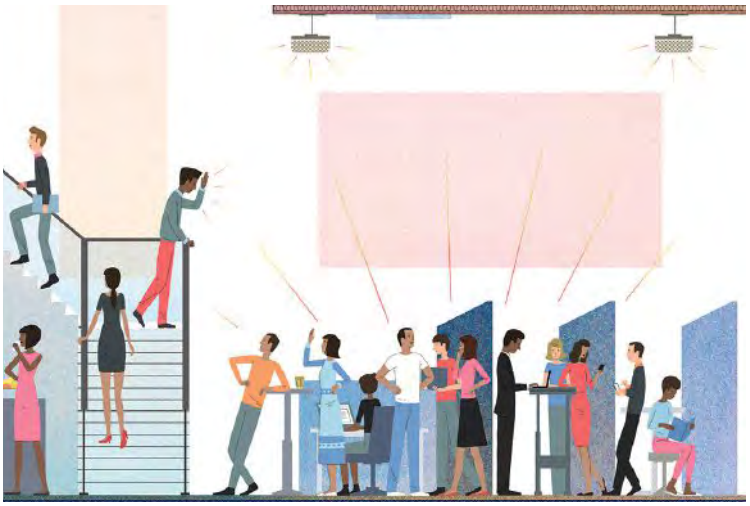
WORKPLACE STRESSOR #1: Light

Adequate lighting is conducive to good health. It allows people to see color, perceive space, and perform tasks with ease and focus. But the quality of light in the workplace—both sunlight and artificial—matters. Diffuse ambient light or visible daylight may boost moods, while excessive or uneven light may lead to fatigue and visual discomfort.

Light affects people in nonvisual ways, too. Inadequate exposure to daytime sunlight and nocturnal light pollution over time are linked with increased risk of breast and prostate cancer. Therefore it is critical that workspaces provide regular access to natural light, feature lighting systems that consider circadian rhythms, and reduce sources of glare and visual discomfort.

1. Architects can reduce the effects of glare—stress-inducing excessive brightness—through strategic window sizing, operable controls, and electrochromic glass that reduce disruption without an overreliance on window shading.

2. Architects can use light models and other technologies to ensure adequate levels of equivalent melanopic lux—the parameter that indicates the impact of light on circadian rhythms—at workstations throughout the day, ensuring better rest at night.



WORKPLACE STRESSOR #3: Temperature

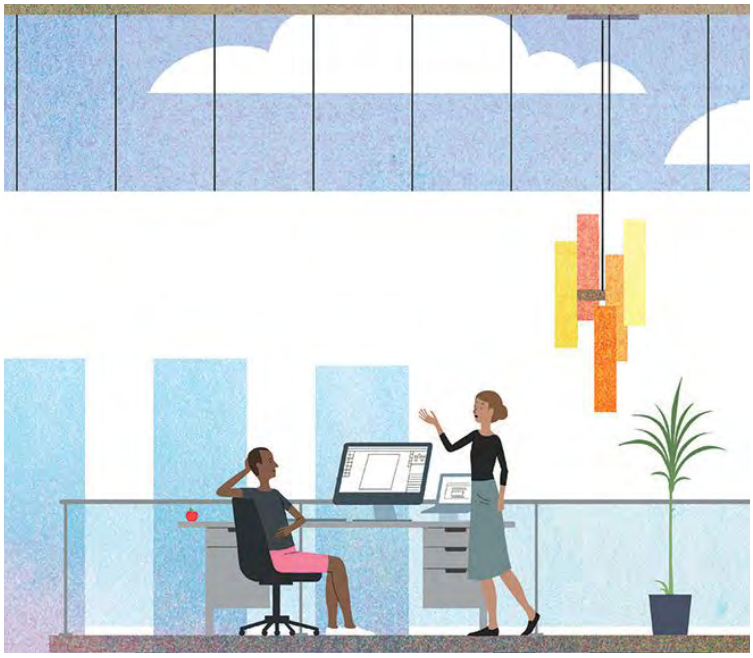
Thermal comfort significantly affects how individuals feel and perform at work, and individual preferences can differ substantially from person to person. Yet many workplaces are optimized for middle-aged men in suits.

Variables such as humidity, air speed, metabolic rate, and clothing affect comfort, productivity, and stress levels. If it's too warm, workers may experience headaches, eye and throat irritation, sweating, or an inability to focus on tasks. If it's too cold, workers will often report feelings of discomfort.

5. Whether designing mechanically or naturally ventilated spaces, architects can work with engineers to balance workers' personal comfort and the building's energy efficiency, improving clients' bottom lines.

6. Architects can provide areas with thermal gradients and personal controls to ensure that workers can find a space that meets their preferences. AIA

Matt Welker



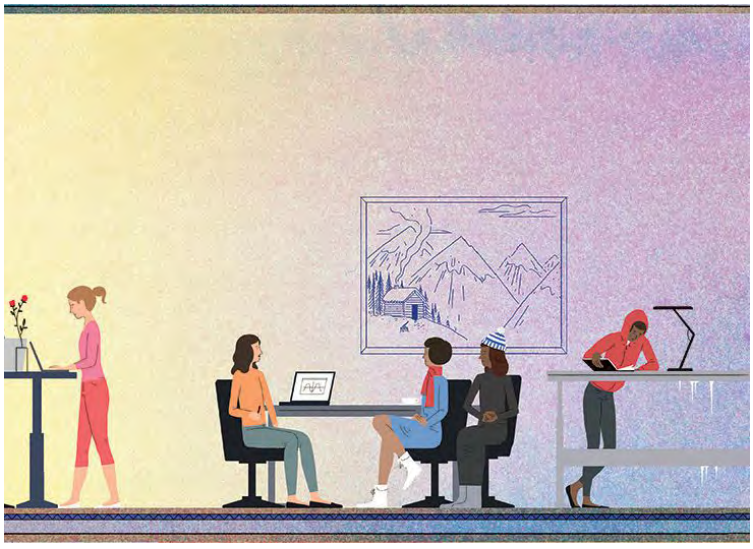
WORKPLACE STRESSOR #2: Acoustics

Office noise is a leading source of dissatisfaction—and distraction—in the workplace. According to researchers at the University of California, Irvine, the modern office employee is interrupted every three minutes. These interruptions come at a cost: Interrupted workers require more effort to complete their work, and experience greater levels of stress.

And while it may be appealing for workers to cue up a Bach cello suite and don a pair of noise-canceling headphones, the long-term exposure may cause permanent hearing damage with no substantial gains in productivity.

3. Architects can provide their clients with a variety of "quiet" and "loud" zones to enable speech privacy—a leading concern among office workers—without impairing collaboration. An important first step is identifying and reducing noise emanating from mechanical systems and office equipment.

4. Architects can incorporate absorptive surfaces in order to reduce unwanted noise reverberation. Examples of sound-reducing treatments include wall panels, ceiling baffles, and other surface enhancements.



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CASE STUDY: **KMD ARCHITECTS**

Beyond Visualization

Lumion Helps the Clients of KMD Architects Make Better Decisions

"We are an idea firm ..." begins the firm's official introduction.

That reverence for ideas, their generation, development, propagation, and sharing is at the heart of San Francisco, Calif.-based KMD Architects. This 53-year-old employee-owned firm has turned their ideas into some of the finest examples of commercial, retail, healthcare, government/civic, office, and hospitality building environments, earning hundreds of design awards worldwide, including more than 40 AIA awards.

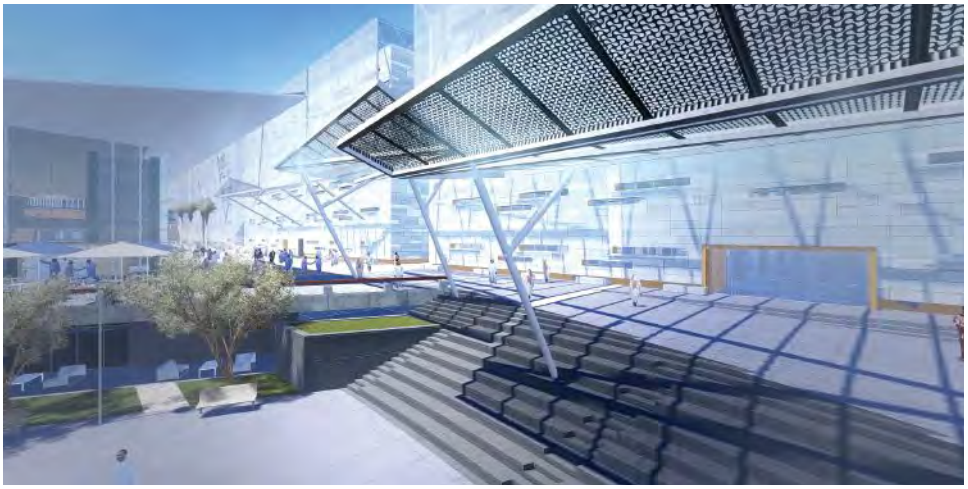
Orchestrating a staff of over 200 of self-described "artists, pirates, scientists, math professors, and bards" is the responsibility of KMD Director of Design and CEO Ryan Stevens, AIA. Stevens assumed the KMD leadership post in 2013, after a 13-year stint as the firm's Design Director. How does Stevens view the design process? What does he do to help ideas rise and flourish? What helps him inspire business-winning thinking from talented design veterans as well as first-year rookies?

Challenge

"The key to good design is enabling good decisions" Stevens explains.

For CMD, that means actively engaging the client in the ideation process. Stevens understands some may view that approach as a risk, but it's one Stevens is open to. "You want to demonstrate different ways of thinking and involve your client in that process," the KMD CEO advises. "We like to engage the client so they better understand our ideas and can make well-informed decisions.

"There's often a predilection among designers to control the design process," Stevens cautions. "They fear working interactively with a client. I personally don't worry about that. You can do more to garnish client support if you actively compare and contrast design ideas in real-time.



Medical University rendering courtesy of KMD Architects

"This morning, for example, I was meeting with a team on a project. We must have reloaded the model 23 times. We'll ask 'What if we changed this?' 'Altered that?' 'Narrowed this?' 'Added that?' We often do this in front of clients."

Solution

For CMD designers, Lumion has earned a coveted place in the CMD work flow as a trusted way to "deal with the decision-making process."

Lumion is a software solution that enables CMD architects to quickly, easily create immersive videos, images, and 360 panoramas. Today 61 of the world's top 100 architect firms are among thousands of organizations that have joined CMD as a Lumion customer.

"Many designers think of Lumion as a rendering tool. But rendering usually represents finality, all the design decisions have been made. The predominant reason we use Lumion is for decision-making. It lets us experience our decisions. How does sunlight effect the main entrance at 10:00 a.m.? At 4:00 p.m.? We can quickly see the effects of light, reflection, placement of elements on the fly. I often discover things I didn't plan for."

Lumion's ease and speed helps create a powerful rallying point for faster client acceptance. "Lumion helps us get people behind an idea. They better understand it," Stevens says. "With Lumion, you don't have to use fancy words to describe what you're trying to do.

"Lumion lets clients experience your ideas. They become advocates." •

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ROBUST WALLS WITH CONTINUOUS FOAM PLASTIC INSULATION

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LEARNING OBJECTIVES

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1. Examine NFPA 285 approved wall assemblies that use foam plastic insulation in cavity walls and rain screens.
2. Understand how insulation manufacturers can assist architects in attempting to secure approval from code officials without first performing time consuming NFPA 285 tests on the wall assembly proposed for their project.
3. Describe the importance of using continuous insulation in wall assemblies.
4. Find alternative wall designs that might provide better insulating performance and better prevention of moisture penetration/accumulation than vapor permeable wall designs.

CONTINUING EDUCATION

CREDIT: 1 LU/HSW

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INCREASED INSULATING PERFORMANCE OF WALL ASSEMBLIES

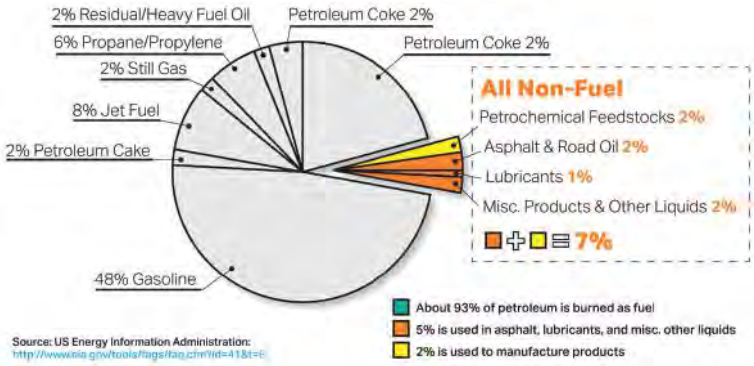
Many architects today and in the future will be looking for ways to increase the insulating performance of wall assemblies in order to meet increasingly stringent minimum energy code requirements. Using the highest R-value insulations, all other things being equal, would seem to make sense as a key measure in developing walls with greater insulation performance.

The idea that building design and material selection can impact occupant health has also landed on the architectural profession. Moisture accumulation and mold as a health issue must be addressed. Some believe that a wall must maximize its ability to dry out via vapor diffusion and related phenomena to efficiently prevent moisture accumulation, but that approach sacrifices thermal performance. There are other approaches.

Finally, misconceptions exist about foam plastic insulation preventing compliance with the IBC requirement concerning flame propagation. There are wall assemblies that are approved for NFPA 285 and manufacturers of polyurethane insulation that are ready to assist if code officials require an actual test.

Foam plastic insulation (polyiso board and spray polyurethane foam) can be used in code-approvable wall assemblies that work in cold, warm, marine and humid climates. Architects will be able to create alternatives to vapor permeable wall assemblies that address three main concerns: NFPA 285 flame spread tests, mitigating moisture retention within walls, and delivering higher insulating performance with great levels of comfort.

The International Building Code requires that walls with foam plastic insulation pass the NFPA 285 test. Image courtesy of Construction and Maintenance Solutions, LLC



Only 2% of all the oil harvested is used as feedstock for the manufacture of products such as wall insulation. Image courtesy of US Energy Information Administration (PVC) lack.

A Petroleum Bias

Many architects believe that using building materials comprised of petroleum is inherently bad. This is a common misconception that must be clarified. The fact is, approximately 93% of petroleum is burned as fuel, 5% is used in asphalt, lubricants, and other miscellaneous liquids, and only 2% of all the oil harvested is used as feedstock for the manufacture of products, such as wall insulation (plus many other products in construction, medical and other fields). As the chart above shows, this brings all non-fuel uses to only 7%. The major problems with petroleum arise when it is combusted as heating oil, diesel fuel, gasoline, jet fuel, propane, natural gas, or still gas, not when it's used to manufacture products.

Moving Toward Continuous Insulation (C.I.)

Continuous insulation is now the preferred, and often mandated, way to insulate a wall. Continuous insulation means placing insulation on the outside face of the sheathing so that it is not interrupted by studs inside the wall, which cause thermal breaks. There may or may not be a weather barrier in between the sheathing and the insulation. Some sort of weather barrier should always be used in the wall assembly. Foam plastic insulations tend to provide additional resistance to moisture penetration and absorption—a useful redundancy—while fibrous insulations absorb the moisture.

LEED projects mandate continuous insulation, but in general, it is considered a basic design solution for improving the energy efficiency of walls, and is becoming the norm even if not yet required by code everywhere.

Another phenomenon is that building energy usage is being driven lower, so older wall designs no longer work. For example, in the past architects could incorporate more robust HVAC systems to help dry out walls, but the more energy efficient HVAC systems that are now required no longer serve this auxiliary purpose; the walls now have to dry out on their own. Therefore, as we drive overall energy usage down, wall design and moisture management are becoming ever more important. Continuous insulation can be one part of the solution to this conundrum.

NFPA 285

Foam plastic insulation is the generic term for polyiso board, spray polyurethane foam, expanded polystyrene, and extruded polystyrene. These are all insulations that are made from oil.

The International Building Code requires that walls with foam plastic insulation pass the NFPA 285 test, aka Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

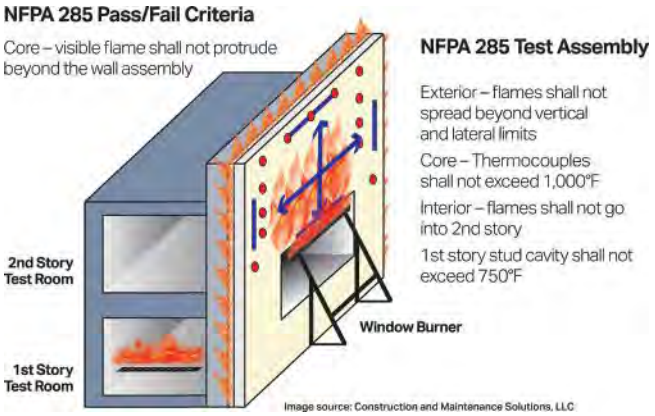
Many are unaware that some insulation manufacturers have pre-emptively and successfully tested wall assemblies using foam plastic insulations to help guide architects and code officials in making choices about how walls are designed, and to aid those seeking less energy use and better thermal comfort for occupants.

This diagram demonstrates what the test looks like. The test begins with a five-sided concrete box; the sixth side is where a company builds their wall to be tested. The wall is always the same dimension, always has windows in the same place, and is always set on fire in the same ways.

The fire is first introduced inside the lower floor with the room burner. After a short period of time the fire is introduced within the thickness of the wall at the window burner. These two sources of flame are designed to simulate how fires may get into a wall and how flames can spread through the wall.

In order to pass the test, the exterior flames must not spread beyond vertical and lateral limits; these limits are five feet left of, right of, and below the center, plus 10 feet above the window opening. If there is any visible evidence of fire even one inch beyond these limits the wall assembly fails.

In addition, thermocouples read the temperature inside the wall. The core temperature may not exceed 1,000 degrees Fahrenheit and visible flames should not protrude beyond the wall assembly. There is a 1st story and a 2nd story test room; the interior flames should not go into the 2nd story. The 1st story stud cavity should not exceed 750 degrees Fahrenheit. And finally, there can be no appearance of flames at the edges of the wall assembly.



In order to pass the test the exterior flames must not spread beyond vertical and lateral limits; these limits are five feet left of, right of, and below the center, plus 10 feet above the window opening. Image courtesy of Construction and Maintenance Solutions, LLC

As you can see, this is a time-consuming test to run, and it's expensive, but the results are clear.

Hurdles include not only the cost, but also the time it takes to schedule the test, build the wall assembly at the test site, and then actually conduct the test. The time required is often more of an issue with building owners than the cost of the test since a part of the building design may remain unresolved until the results of the test are known.

VIEW BENEATH WINDOW HEAD

Protect sensitive materials by blocking fire and heat from getting into the wall cavity at the window head. Image courtesy of Carlisle Construction Materials and Construction and Maintenance Solutions, LLC.

Wall Assembly Details and NFPA 285

It is not just one material that helps a wall assembly pass NFPA 285; it's an assembly. A poorly detailed wall may fail using the same products as a better-detailed wall. Window head details can make or break the NFPA 285 results, so it is an important strategy to protect temperature and flame sensitive materials by blocking fire and heat from getting into the wall cavity at the window head. Steel, concrete, masonry, mineral wool, fire-rated gyp board, fire-treated lumber, and/or intumescent caulk may be required.

This image shows the view beneath the window head. At the top of the window head, flammable and semi-flammable weather barriers are introduced over the fire-treated lumber, closing off the inside face of the wall (blue material). The wall assembly in this image has a steel lintel on the outside, but there is a two-inch air gap between the vertical studs (jamb) which are also covered in the blue weather barrier, and the insulation. It is possible to fire caulk the narrow ½"–1" gap at the head. But you can't caulk the 2" gap at the jamb. With this wide gap, many assemblies will fail the NFPA 285 test. In many cases, blocking off the gaps is an essential part of wall assembly design no matter what insulation is used.

Wall Assemblies—XPS Insulation

Extruded polystyrenes (XPS) are thermoplastic insulations by classification, meaning that they do not resist heat and fire well. When exposed to enough heat they can lose their shape. When they catch fire, and when on fire, material on fire drips from the board.

In most roof and wall assemblies seeking a fire rating that are constructed with extruded polystyrene, another layer of protective material must be placed between the flame and the XPS to prevent the XPS from directly contacting the flame and absorbing too much heat or catching on fire.

Window Head Condition—Polyiso Insulation

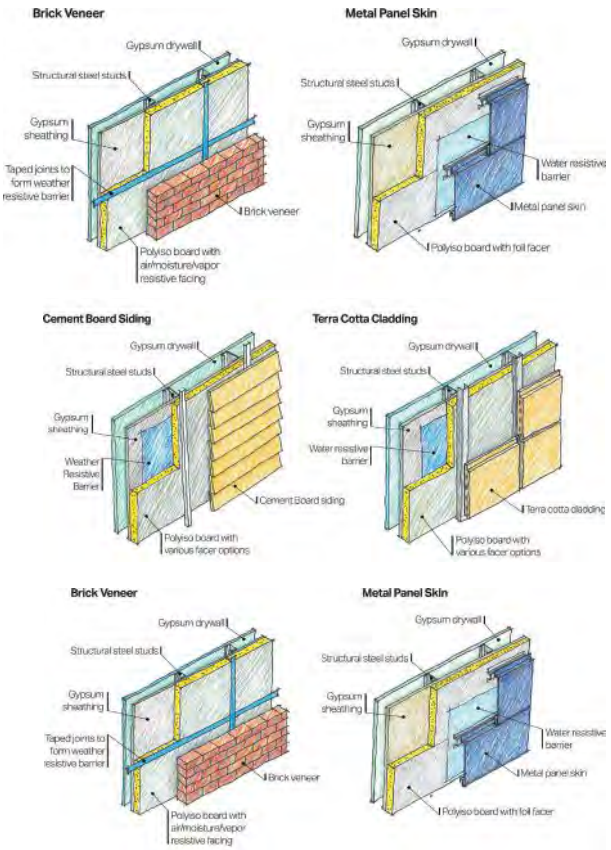
By contrast, polyiso board is a thermo-set product, which means that it won't change shape or disintegrate when exposed to flame. It burns, then chars, which retards flame propagation to a certain degree. This is why it can be set in window openings in wall cavities without other protective material between the insulation and the window opening in many NFPA 285 compliant assemblies. Other reviewing agencies such as the insurance oriented FM Global may have additional requirements. It is advisable to check with the building owner's insurance carrier for any additional requirements they might have beyond building code compliance.

For a long time, code officials ignored the code requirement for testing walls containing foam plastic insulation. Then, with the advent of continuous insulation, the NFPA 285 test became more often required by code officials. The required tests on these known insulations and wall assemblies can take $15–$30,000 or more to erect the wall at the testing site and then run the test. It can take three to four months waiting in a queue to get an assembly tested. As you can imagine, it's difficult to convince a client to either delay a project for that long or incorporate the required time into the original schedule when neither is a normal part of project development.

This is why a number of polyiso board manufacturers have preemptively built and tested a number of wall systems constructed of various materials for NFPA 285. If one of these walls is close enough in design to the wall you are constructing, you can present an engineering report to your code official, showing that a sample/similar wall passed.

You may then not have to perform the test yourself because the wall assembly already tested satisfies the code official's concerns.

Whether you have to do an actual test or not, by doing all these NFPA 285 tests preemptively, certain polyiso manufacturers are now very knowledgeable and could help anyone who's contemplating designing a wall with polyiso insulation in it.



Foam plastic insulation in six NFPA 285 walls. Images courtesy of Covestro

FOAM PLASTIC INSULATION IN NFPA 285 WALLS

Let's look at these six illustrations, each showing steel stud walls with polyiso board continuous insulation. All have passed NFPA 285, and have a variety of 3rd party engineering opinions that expand the applicability of the testing. The first is a typical brick veneer wall with steel studs. Next to it is an un-insulated metal panel skin, a very different type of veneer. One would think that the brick would actually help

with the flame-spread, but right next to it is a wall assembly that just has pieces of metal. This shows that the polyiso board and other thermo-set insulations can resist flame spread, irrespective of the cladding without additional protection or unusual additional materials.

Cement board siding is a typical cladding material. Next is a terra cotta rainscreen, which is designed so that air moves between the insulation and the back of the cladding, yet it still passes the NFPA 285 test. Finally, both natural stone cladding and traditional stucco veneer with polyiso insulation passed the test.

Some insulation manufacturers have 3rd party NFPA tests for certain wall assemblies. These assemblies are a combination of building envelope skins, steel studs, and polyiso board insulation. NFPA 285 compliant wall assemblies that have been preemptively tested successfully include components such as the following:

The skins include:

- Brick veneer
- Stucco (minimum ¾" thick with exterior lath)
- Limestone veneer (minimum 2" thick)
- Cast stone veneer (minimum 2" thick)
- Natural stone veneer (minimum 2" thick)
- Metal composite material (MCM)
- Terra cotta cladding (1-1/4" thick minimum)
- Metal panels
- Cement board siding

Manufacturers successfully tested the same wall assembly with different types of polyurethane insulation board products. Each of these skins have passed NFPA 285 burn tests using the following insulation board products:

- Polysio board with coated glass mat facers and WRB
- Polysio board with foil facers and WRB
- Polysio board with nailable fire-treated wood panels and WRB
- Polysio board with air/moisture/vapor resistant facer, taped board joints and no WRB

This article continues on http://go.hw.net/AR1016Course4
Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. Approximately _____% of petroleum is burned as fuel, while only _____% of all the oil harvested is used as feedstock for the manufacture of products.
   a. 10, 80
   b. 93, 2
   c. 80, 7
   d. 25, 75

2. Foam plastic insulations tend to provide additional resistance to moisture penetration and absorption while fibrous insulations absorb the moisture.
   a. True
   b. False

3. The International Building Code does not require that walls with foam plastic insulation pass the NFPA 285 test.
   a. True
   b. False

4. Polyiso board is a thermo-set product, which means that it won't change shape or disintegrate when exposed to flame.
   a. True
   b. False

5. Which type of wall resists more moisture retards moisture penetration, while allowing drying toward the interior if/when moisture gets in?
   a. Higher perm
   b. Lower perm

6. A rigid board will remain rigid and resist air penetration, while fiberglass or mineral wool insulation will not stop moisture from entering the stud cavity via air leakage.
   a. True
   b. False

7. In Building Science Corporation tests, walls with continuous insulation in the Pacific NW keep their sheathing moisture content below 20 percent almost year-round, protecting the interior surface temperature of the sheathing from getting cold enough for condensation.
   a. True
   b. False

8. Which of the following are true?
   a. Highly permeable walls allow moisture in vapor form to pass through
   b. High perm insulation retards moisture from air leakage inside the wall
   c. Vapor diffusion can be relied upon to drive moisture out of walls all of the time
   d. Low perm walls keep out moisture from air leakage and vapor drive
   e. Low perm walls save HVAC energy when they prevent moisture from entering the building
   f. A, D, and E
   g. All of the above

9. Continuous insulation foam plastic insulation walls that are vapor-impermeable have the lowest wintertime air leakage and lowest wintertime sheathing moisture content.
   a. True
   b. False

10. Which of the following is a benefit of continuous low perm foam plastic insulation as a wall design strategy?
    a. Control bulk moisture from precipitation
    b. Control air penetration and air leakage into the wall
    c. Maintain warmer temperatures within the stud cavity
    d. Control moisture penetration via vapor drive
    e. B, C and D
    f. All of the above

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Presented by:

Horton AUTOMATICS The Automatic Choice

ACCESSIBILITY FROM THE FIRST STEP

DESIGNING AUTOMATIC PEDESTRIAN ENTRYWAYS TO EXCEED ADA STANDARDS

By C.C. Sullivan

LEARNING OBJECTIVES

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

1. Discuss how to design entrances using automatic sliding and swinging doors to fully address ADA compliance and the needs of physically challenged individuals.
2. Describe how automatic door systems function and considerations for accommodating their footprints and operational aspects in the overall building design.
3. List key criteria for choosing a door system or configuration for a specific application, based on ADA and general principles of use.
4. Explain how safety and security devices and actuators have expanded the functionality of door systems, including for ADA applications.
5. Reconcile the use of automatic door systems with building codes and ANSI guidelines.

CONTINUING EDUCATION

AIA CREDIT: 1 HSW/LU
AIA COURSE NUMBER: AROCT2016.2

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BASICS OF ACCESSIBILITY AND DOOR SYSTEMS

One of the country's most significant civil rights laws when it passed in 1991, the Americans with Disabilities Act (ADA) prohibits discrimination against people with disabilities in every facet of public life, including employment, transportation, public accommodation, communications, and governmental activities. The Department of Justice enforces the law's application to public accommodations and government services, and the Architectural and Transportation Barriers Compliance Board (ATBCB), also known as the United States Access Board, "issues guidelines to ensure that buildings, facilities, and transit vehicles are accessible and usable by people with disabilities," according to the U.S. Department of Labor.[1]

Yet even today, more than 25 years after ADA became law, architects involved in the ADA through building design are aware of an "implementation gap": Places where "the ADA remains unimplemented, and gaps in information, knowledge, and interest in complying with the ADA still exist," as defined by the National Council on Disability.[2] In one of those areas—entrances to buildings—significant strides have been made recently in ADA policy, technology, and implementation. These include new automatic door systems and products, as well as design solutions to improve the accessibility and safety of today's building entries while also boosting functionality and *universal design*, meaning that they are inherently accessible to all people, as well as those with disabilities.

Addressing these challenges, a growing number of architects are adopting and sharing strategies to boost universal design for doorways and entrances. Rather than aiming for minimum compliance, which is enforced by codes and ADA, these savvy designers are thinking about universal design and user preferences, and differentiating their buildings by leveraging appropriate technologies. The keys to success include:

- Choosing and designing appropriate entries, openings and doors for people with varied abilities.
- Applying those door systems to meet and exceed all ADA requirements for entries in buildings of certain sizes.
- All while complying with published building codes and standards.

In some cases, project teams are reviewing case studies on best-in-class door system designs to apply similarly novel solutions. In addition, they're consulting the *2010 ADA Standards for Accessible Design*, initiated in March 2012, which had a few key changes, including some for automatic doors. At the same time, building codes have changed, notably the International Code Council (ICC)/American National Standards Institute (ANSI) A117.1, *Accessible and Usable Buildings and Facilities*. Architects encounter these new rules in the International Building Code (IBC) and the International Fire Code (IFC); for egress doors, the rules are also referenced in the National Fire Protection Association's NFPA 101, *Life Safety Code*.

New automatic door systems include auto-slide and auto-swing doors that open paths to novel design solutions, as well as a new generation of large-diameter automatic revolving doors.

STANDARDS—AND SOLUTIONS

In these ways, architects push to keep abreast of door system improvements to focus on improving accessibility and the universality of their designs. On the technology side, new automatic door systems include auto-slide and auto-swing doors that open paths to novel design solutions, as well as a new generation of large-diameter automatic revolving doors.

According to the Builders Hardware Manufacturers Association (BHMA), standards for *power-operated pedestrian* doors are covered in ANSI/BHMA Standards A156.10 and A156.19.[3] These include automatic doors and power-assist and low-energy types, their operator mechanisms, and components such as sensing devices, guide rails and control mats. Protective elements include the *safety zone*, where the presence of people will prevent door operation when appropriate, as well as *break out* action, an emergency feature allowing the doors to swing in the egress direction.

Today's power-operated door systems have evolved dramatically. New solutions include storm-resistant types that withstand wind pressures as high as 85 psf or wind speeds exceeding 100 mph. In-ground operators now allow architects to hide the mechanisms in the floor for aesthetic and safety benefits. Automatic security revolving doors, often used with flanking swing doors for ADA compliance, offer protections against piggybacking and tailgating, two key issues for hospitals, schools and police stations. Automatic slide doors can even be engineered for ballistic-rated openings. Indoor powered systems offer applications for self-closing, smoke-rated (UL 1784 compliance) sliding doors for intensive care unit (ICU) use in healthcare settings.

With these and other tools, architects now design entries with better, more comfortable layouts and clearances, including for larger vestibules that help maintain interior temperatures while also reducing building energy consumption. The power-actuated systems even help architects create more resilient enclosures, meaning they are suitable for significant swings in weather.

Most important, many of the automatic door products address ADA compliance as well as innovation in universal design. While in the past some have called this barrier-free or even "special needs" design, today the term universal design is seen as best practice—a sign of smart, high-quality architecture.[4] Many building projects accommodate an increasingly diverse user population, with older occupants and a diversity of physical and intellectual challenges. The growing trend of service animals adds yet another dimension. In all cases, ADA provides a baseline for accommodation; but leading architects are going beyond the bare minimum to consider the preferences of the *physically challenged* user community and to differentiate their buildings and landscapes by being truly accessible, comfortable, and open to all.

Many automatic door products address ADA compliance as well as innovation in universal design.

THE EVOLUTION OF BETTER DOOR SYSTEMS

For these architects, part of the challenge is educating their clients on key questions related to entryway and doorway system design. Owners need to know: What's a barrier? And what's "readily achievable" in terms of accommodations? Also, how is ADA enforced? Many of these questions are resolved in the original ADA (1990) and Amendments (2008). Yet, owners also need to consider improvements over standard practice in entry designs to achieve the benefits of universal design.

For doors in ADA applications, the key elements for design-phase review include: the number and size of openings; the clearance width of the door opening and other maneuvering clearances; hardware selection (including

security considerations); the height of thresholds; and the slope and evenness of floors and ramps. ADA standards and ANSI/BHMA requirements also apply to all power operators. The U.S. Access Board provides direct advice in its *Guide to the ADA Standards* under "Chapter 4: Entrances, Doors, and Gates"[5] on the number and size of openings, opening force and closing time, hardware design and function for openings, and threshold and floor characteristics at openings, which generally should be smooth, level and flush.

Recent changes in the 2010 updates to the ADA and in the current IBC include a force limit for door hardware of 5 pounds-force (lb or lbf) for interior applications and 12 lb for exterior doors. New profile requirements for manual swinging doors[6] are also now in effect. For automatic doors, two key changes have emerged: First, the requirement for standby power for automatic operators on swing doors without proper maneuvering clearance on the egress side. Second, safety requirements are now given for low-energy automatic operators, which must meet most or all safety requirements for the full-powered automatic operator and in some cases must provide for safety mats and guide rails.[7]

Other general requirements to consider for best practices include operator variables—speed, time delay, and obstruction sensing—as well as options for vision glass, frame options and signage. These are not only useful elements of universal accessibility, but they also contribute to a building's aesthetics and can make a more attractive and accommodating facility.

NEW DOOR TECHNOLOGIES AND SYSTEMS

Before going into detail on these ADA attributes of entries, a closer look at automatic and power-operated door systems helps provide a toolkit for achieving and exceeding mere compliance. A first variable is *product selection*: Is the best door solution a revolving, swing, slide or folding type? For example, an auto-slide door may be preferred over an auto-swing door due to right-of-way (ROW) requirements or door area layouts and clearances, hands-free actuation, or a combination of those. A second consideration is controls: Which area sensors and actuators will serve most safely and efficiently the expected inbound and outbound traffic, including the widest range of user types? Finally, *mode of operation* should be clearly defined in any specification, meaning the precise description of how the automatic door system is to function. For example, there may be more than one "mode of operation" such as during secured and non-secured hours. Similar questions must be addressed for power-operated interior doorways, such as those seen in hospital ICUs.

From these starting points of operator and controls selection, architects and specifiers then consider a number of product types, configurations and options:

- Door type. Is the automatic opening best served with single, pair, or double egress swing door operation or perhaps by a sliding door? Does a compliant revolving door suit the needs for the entryway?
- **Operation**. Considering the traffic, layout, and clearances, should the doors be in-swing, out-swing, or sliding? Is left- or right-handed operation best, and which way should the sliders move?
- **Power assist, low energy or full power.** While some situations need power-assist and low-energy swing doors, which can be opened manually or activated with a "knowing act" such as pressing an actuator push-plate, heavy traffic applications often require full-power swing or sliding doors, which would be routinely motion sensor actuated.
- **Sensors**. Closing time is adjustable, and some actuators can be programmed with safety modes to reverse direction when the door touches an object or person, called *door-reversal sensors*. Novel sensor systems for door operators include *obstruction-sensing* technology, which reduces opening speed when the entry is blocked, as well as *hold-open sensors*, which maintain the door in the open position as long as there is a presence in the threshold area.
- **Installation**. Surface applied or overhead concealed systems offer different benefits for the application, aesthetics and architectural integration. In-ground operators may be preferred for certain applications, such as swing door entrances with arches or all glass curtain wall construction.
- **Operator access**. For installation and maintenance of the electric door operators, door headers can have bottom or side access panels if they are easily accessible. In-ground operators with top access may be preferred for aesthetics or when there is no headroom above the door frame to mount an operator.

In addition, an automatic door system can be ADA compliant as well as hurricane sturdy. Some door systems on the market are rated for high wind and air pressures, water ingress and windborne projectiles. These storm-ready assemblies respond to needs for better weather protection as well as local codes including the Miami-Dade and Broward County standard for high-velocity hurricane zones. While storm resistance is not a part of ADA compliance, it is often a key part of the opening specification.

DEFINITIONS OF POWER-OPERATED DOORS

For pedestrian applications, automatic doors are defined and standardized by the group Builders Hardware Manufacturers Association (BHMA) and their nationally recognized ANSI/BHMA Standards A156.10 (full powered) and A156.19 (low energy).

- **Automatic Door:** A system combining a door, an operator, and controls.
- **Automatic Operator:** The mechanism bringing about the opening and closing of a door upon actuation.
- **Break Out or Emergency Breakaway:** In emergency mode, an auto-swing or auto-slide door permits opening by swinging in the egress direction (often required when power-operated doors are in the *means of egress)*.
- **Control Mat or Floor Mat:** The recessed component in front of an automatic door used to actuate the door, prevent its activation, or hold it open.
- **Guide Rail:** Architectural separation elements used to control traffic.
- **Low-Energy Door:** Power-operated doors that operate in a controlled manner to meet a specified maximum amount of kinetic energy.
- **Power-Assist Door:** Power-operated doors designed to reduce the opening resistance of a self-closing door.
- **Sensing Device:** Including motion, photocell, and area occupancy sensors, these work in place of or in tandem with a control mat.
- **Safety Zone:** An area on the outswing side of a power-operated door and the threshold area that must be protected when occupied—for example, by motion sensors or control mats, or both.

Source: Builders Hardware Manufacturers Association
http://www.buildershardware.com/resources/Terminology/power-operated-pedestrian-doors

Most auto-swing and auto-slide systems have adjustable control of the hold-open time as well as adjustable time-delay closing, ranging from two seconds up to 30 seconds.

To design for ADA applications using these and other automatic entry door offerings, project teams increasingly deploy controls and operators that make accessibility safer, more comfortable and efficient. Most auto-swing and auto-slide systems have adjustable control of the hold-open time as well as adjustable time-delay closing, ranging from two seconds up to 30 seconds.

This article continues on http://go.hw.net/AR1016Course2.
Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. For doors in ADA applications, which of the following is a key consideration for design-phase review?
   a. Number and size of openings
   b. Clearance width of door opening and other maneuvering clearances
   c. Hardware selection
   d. Height of thresholds
   e. Slope and evenness of floors and ramps
   f. All of the above

2. Recent changes in the 2010 updates to the ADA and in the current IBC include a force limit for door hardware of _____ pounds-force for interior applications and 12 pounds-force for exterior doors.
   a. 1
   b. 5
   c. 10
   d. 15

3. True or False: Some actuators can be programmed with safety modes to reverse direction when the door touches an object or person, called door-reversal sensors.

4. To protect occupants in an emergency, multiple means of egress are typically sized so that if one means is lost, the remaining available capacity would not be lower than ____ percent of the total required capacity.
   a. 20
   b. 30
   c. 40
   d. 50

5. Per the ADA standard, doorways must always have a clear opening of at least _____ inches wide.
   a. 24
   b. 30
   c. 32
   d. 46

6. In new construction, the rule is that _____ percent of public entrances must be accessible.
   a. 10
   b. 30
   c. 60
   d. 90

7. True or False: At all entries except those used in only one direction, the maneuvering clearances are required both inside and outside.

8. For all door types in new construction projects, threshold height must always be ____ inch or less.
   a. 1/4
   b. 1/2
   c. 1
   d. 2

9. Which type of device reduces (but does not completely eliminate) the needed opening force, activated by initial manual force, switches, or sensors?
   a. Power-assisted
   b. Low-energy
   c. Full-power operators

10. True or False: Most doors with low-energy operators do not need safety sensors, control mats, or guide rails because limits on their opening speed and force help protect users from accidents or injury.

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ACOUSTIC PRIVACY WITHIN THE BUILT ENVIRONMENT

Presented by:

Photo © iStockphoto.com/mediaphotos

LEARNING OBJECTIVES

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

1. Define 'acoustic privacy' and why it is important.
2. Explain how speech intelligibility is measured within the built environment.
3. Identify how to achieve acoustic privacy using various interior elements.
4. Describe the impact of background sound levels within both open and closed spaces.

CONTINUING EDUCATION

CREDIT: 1 LU/HSW

COURSE NUMBER: ARmay2016.6

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By Niklas Moeller

INTRODUCTION

Typing the word 'privacy' into any search engine yields a virtually endless stream of entries describing the ways in which this basic human right can be violated. There are reports of hackers acquiring credit card information, law enforcement agencies mining social networking sites, and members of the public using drones to take aerial photographs. More recent headlines indicate that voice-activated televisions can even eavesdrop on their owners.

Our preoccupation with the vulnerabilities exposed by the internet and electronic products is understandable given their relatively rapid spread into almost every aspect of our lives.

However, we should not lose sight of the fact that privacy can still be violated in 'traditional' ways. In fact, it can even be lost to those who do not intend to infringe upon it. People are often exposed to sensitive information simply by being within audible range of a conversation.

Current privacy legislation tends to focus on securing access to information stored on computers or within filing cabinets, but attention also needs to be paid to our built environment. When examined in this context, privacy has both an acoustic and a visual component. This course primarily focuses on the former, except insofar as it is affected by the latter.

WHAT IS ACOUSTIC PRIVACY?

Many people immediately equate acoustic privacy with speech privacy, but there is more to this concept than the ability to clearly hear what another person is saying.

For example, even if the conversation taking place in the room next to you is unintelligible, you may still be able to identify the speaker's tone and ascertain whether they are happy, sad or angry. This type of information can be considered private under certain circumstances, such as when issuing from behind the closed door of a human resources manager's office. The same can be said for non-verbal noises like those overheard from an adjacent hotel room.

How much we understand of a conversation also depends on whether or not we can see the speaker. This effect—known as visual cues—has been quantified by various studies. Generally speaking, if you can only understand 20 percent of someone's conversation when you are not looking at them, the ability to see their lips increases that amount to nearly 55 percent. If you start at 50 percent, visual cues increase it to almost 90. In other words, there is also a visual component to acoustic privacy, which is important to bear in mind when designing a space.

Furthermore, acoustic privacy should not only be considered from the perspective of the person speaking, but also that of the listener(s). The reasons will become clear when we explore the various impacts of a lack of privacy.

WHERE IS IT NEEDED?

A lack of acoustic privacy carries real risk, particularly in facilities where there is a perceived need for it or an expectation on the part of its users. Examples that readily spring to mind include hospitals, bank branches, law offices, government and military facilities. However, other types of spaces—such as commercial offices, call centers and hotels, to name but a few—have privacy needs as well. The degree required typically depends on the type of activities the space hosts.

WHY IS IT NEEDED?

It is easy to understand the need for acoustic privacy—or even acoustic security—from a speaker's perspective, particularly in environments where they are discussing medical information, financial planning, personal relationships, trade secrets, matters of national security, and similarly confidential topics. However, a lack of acoustic privacy can have impacts beyond divulging sensitive information to unintended parties. This fact becomes clear when we shift our perspective from the person talking to that of the involuntary listener.

When a noise or voice enters 'our space,' some degree of annoyance is typical, but it can also make us feel as though our privacy is being invaded or our sense of physical separation from others violated. Perhaps the most relatable examples of this sensation are when the guest in a neighboring hotel room turns up their television's volume or the patient at the other end of a waiting area starts speaking loudly into their cell phone.

When we can unintentionally overhear a conversation, we often feel annoyed or even the sensation that our own privacy is being violated. It can also make us insecure about our level of speech privacy, compromising our ability to freely communicate.
Photo © iStockphoto.com/fotostorm

If we can inadvertently hear a conversation, we can also become self-conscious about our own level of privacy. In some contexts, it can create a sense of unease, which in turn impacts our ability to freely communicate. For instance, if we visit a medical clinic and hear what is happening in the adjacent examination room, we might be less inclined to disclose information to the nurse or doctor, knowing that we too can be overheard.

The degree of acoustic privacy afforded by the built environment can even impact an organization's brand image. We want to be in control of our personal information when meeting with a financial or legal advisor, for example, and a positive acoustic experience can reinforce our confidence in their firm. This level of protection is also indispensible for staff to effectively negotiate the terms of various agreements.

In some countries, protecting verbal communication within particular types of facilities is actually mandated by law. The Health Insurance Portability and Accountability Act (HIPAA) introduced by the U.S. Department of Health and Human Services in 1996 is a good example. It requires healthcare entities to take "reasonable safeguards" to ensure speech privacy during both in-person and telephone conversations with patients and between employees.

Acoustic privacy is also vital to employees' overall satisfaction with their workplace. A decade-long survey of 65,000 people run by the Center for the Built Environment (CBE), University of California, Berkeley, found that lack of speech privacy is the number one complaint in offices. Participants expressed irritation at being able to overhear in-person and telephone communications, as well as concern for their own level of privacy.

WHAT ABOUT THE OPEN PLAN?

The topic of workplace satisfaction also emphasizes the need to consider those occupying spaces other than closed rooms. Though some may dismiss the importance of acoustic privacy when designing an open plan, studies show that it has a significant impact on productivity.

For instance, research conducted by Finland's Institute of Occupational Health shows that unwilling listeners demonstrate a five to 10 percent decline in performance when undertaking tasks such as reading, writing and other forms of creative work. Simply hearing that someone is speaking can disturb concentration, but this problem is greatly magnified when you can clearly understand what they are saying because, if you can follow a conversation, it is much harder to ignore it.

Though an organization might not consider privacy a goal within an open plan, it is impossible to justify increasing disruptions. Taking the steps required to lower speech intelligibility within this type of space increases occupants' output and reduces error rates.

ASSESSING SPEECH INTELLIGIBILITY

But how do we assess speech intelligibility within the built environment?

To begin, we cannot talk about this subject without getting into the concept of degrees because we do not need to understand every word of a conversation in order for privacy to be violated. Due to the redundancies and patterns in speech, we can follow much of what is said even if we only hear half of it, and particularly if we have previously been part of a similar conversation. Furthermore, private details can be exposed even if we only hear a small part of the discussion.

We must also acknowledge that is very difficult to subjectively assess degrees of speech intelligibility. For example, a listener would have a hard time indicating with any precision whether they can understand 40, 55 or 70 percent of what someone else is saying.

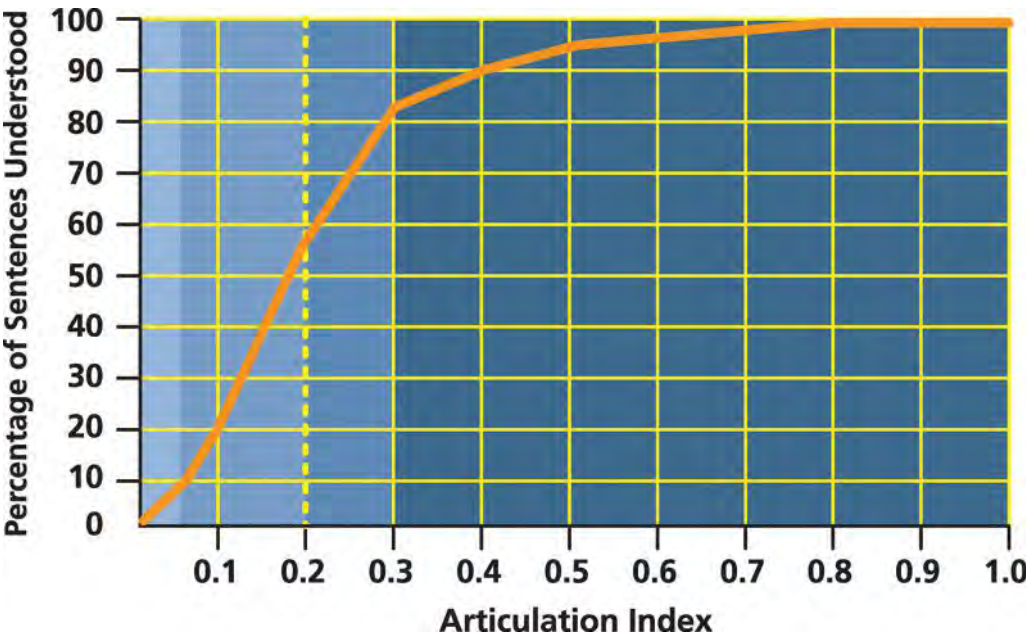
Fortunately, there are ways to measure and quantify the degree of privacy afforded by a built environment. The Articulation Index (AI) remains the most widely used method. It was developed at Bell Labs in 1921 by Harvey Fletcher as he sought to quantify speech comprehension over telephone lines. During the 1950s, those involved in the speech privacy sciences adopted his invention as a measure of exactly the opposite: how much one could not understand.

To calculate AI, one uses a test signal that includes the frequencies known to specifically impact speech comprehension. This signal is measured at 1 meter from the 'source' and again at the 'listener' location. The background sound level is also measured at the 'listener' location in order to quantify how loud the test signal is relative to it—a value known as the signal-to-noise ratio (SNR). This value is critical, because the lower the SNR, the less the intelligibility and the greater the speech privacy. For AI, SNR is measured in each of 15 frequency ranges (from 200 to 5,000 Hz). Each of these is weighted according to the degree to which it contributes to speech comprehension. The final AI value is between 0 (where conversation is completely unintelligible) and 1.0 (where everything is heard and understood).

AI ratings are challenging to interpret in a meaningful way, so studies have been done to correlate them to subjective 'privacy' categories; however, the value of these groupings is somewhat diluted by the wide range of comprehension within each one. 'Confidential' privacy is from 0 to 0.1, 'Normal' from 0.1 to 0.2 and 'Marginal' from 0.2 to 0.3. If AI is above 0.3, there is effectively no privacy.

As shown in Graph 1, the relationship between AI and actual comprehension is not linear. On a 0–1.0 scale, many would expect a value of 0.5 to mean that a listener would understand 50 percent of a conversation, but—as is clear from the graph—they would actually understand approximately 95 percent. The shaded areas along the left of the graph show the Confidential, Normal and Marginal privacy ranges, indicating just how low an AI is required for true privacy.

A more recent arrival on the acoustical scene is a metric called the Privacy Index (PI). PI is based on AI, in that it is calculated as 1 minus the AI value, multiplied by 100, and expressed as a percentage; in other words, 1 - AI x 100 = PI (%).



Graph 1: The relationship between Articulation Index (AI) and intelligibility is not linear. For example, a value of 0.5 means that a listener can understand approximately 95 percent of a conversation, not 50 per cent. A very low AI value is required for true privacy. Image courtesy K.R. Moeller Associates Ltd.

However, PI can be misleading. Part of the problem likely stems from its use of the word 'privacy,' which can cause users to come to the wrong conclusion about the rating's meaning. The fact that it is expressed as a percentage creates even more potential for confusion. For example, with an AI of 0.3, you arrive at a PI of 70 percent. If you refer to Graph 1, the reason to avoid this metric is obvious. When told the PI is 70 percent, most people would assume that they would only understand 30 percent of what is being said. In reality, you would understand nearly 85 percent. Therefore, building professionals should be cautious when investigating acoustical solutions and interpreting related PI statements.

HOW SOUND TRAVELS

In order to design the built environment for acoustic privacy, it is also important to understand the three ways in which sound—and, hence, voice—travels to a listener.

Sound follows a direct path when it travels uninterrupted from the source to the listener or penetrates a barrier between them, such as a wall. This transmission path contributes the most to high levels of speech reaching the listener. However, it can also travel on a reflected path. This type of transmission occurs when sound bounces off of the various surfaces within the space, such as the floors, ceilings, walls, and furniture. Finally, sound can travel in a diffracted path—that is, it can bend around obstacles. This pathway is generally less significant than the first two.

Because speech travels in these various ways, it can be difficult to contain. Several methods must be utilized because no single technique can sufficiently address all transmission pathways.

DESIGNING FOR ACOUSTIC PRIVACY

Of course, the louder a person speaks, the more likely they are to be heard. Building occupants should always try to be mindful of their voice level, but proper etiquette is only effective to a point. The remainder of the acoustical burden has to be borne by the design using a three-tiered approach called the 'ABC Rule,' which stands for absorb, block and cover. Acoustic privacy is achieved by using a well-designed combination of all these tactics. The very brief outline provided below only touches on the interior fit out and furnishings, not the shell.

As mentioned above, the 'A' in the 'ABC Rule' stands for adding absorption. As speech

sounds hit various surfaces within a facility, they are reflected back into the space. If those surfaces are comprised of hard materials such as concrete, glass and metal, the reflected sound energy remains high and overall volumes rise. A high percentage of hard surfaces also increases reverberation (i.e. echo) within the space, making it uncomfortable. In order to control this type of transmission, absorptive materials must be applied to the ceiling, walls and workstation partitions. Because the ceiling is usually the largest unimpeded surface within a facility, organizations should invest in the best acoustic tile they can afford and ensure consistent coverage throughout their space.

'B' stands for blocking speech transmission using walls, windows, doors and other physical structures. This method is most obviously used in the construction of closed rooms, but it is also extremely useful within the open plan. If there are no barriers between occupants in these spaces, speech travels more easily and the ability to see (and be seen) further reduces privacy due to our natural capacity for lip reading. Again, though some might argue that privacy is not expected nor needed within the open plan, understandable speech disrupts occupants' concentration. For this reason, workstation partitions should be no lower than seated head height (60 to 65 inches; 1524 to 1651 mm). Even the direction in which a person faces affects their voice's volume within the neighboring workspace; therefore, occupants should be seated facing away from each other on either side of partitions.

Today, there are numerous pressures to reduce the height of workstations or eliminate them altogether. This trend has had a dramatic impact on the acoustical performance of open plans because though other treatments can reduce overall volume levels and deal with noises generated from farther away, they have no effect over short distances. When barriers are dispensed with, local noise sources remain highly intelligible and disruptive.

This article continues on http://go.hw.net/AR516Course6. Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. 'Acoustic privacy' is simply another term for 'speech privacy.'
   a. True
   b. False

2. Acoustic privacy is only required in areas where confidential conversations are taking place.
   a. True
   b. False

3. Studies show that unwilling listeners demonstrate a ____% decline in performance when undertaking tasks such as reading, writing and other forms of creative work.
   a. 2 to 3
   b. 5 to 10
   c. 10
   d. 20

4. When used to rate speech intelligibility, 'AI' means:
   a. Auditory Insufficiency
   b. Articulation Index
   c. Audio Index
   d. Acoustic Indicator

5. A Privacy Index (PI) of 70 percent indicates that a listener will only understand 30 percent of what is being said.
   a. True
   b. False

6. Sound travels to a listener along a:
   a. Diffracted path
   b. Reflected path
   c. Direct path
   d. All of the above

7. Acoustic privacy is achieved by:
   a. Using physical structures to block sound transmission
   b. Applying absorptive materials to the ceiling, walls and workstations
   c. Covering speech and noise with a sound masking system
   d.All of the above

8. If a sound masking system's loudspeakers are installed facing downwards, the sound does not need to be tuned in order to meet the specified curve.
   a. True
   b. False

9. Because variations in the masking sound affect the level of speech privacy and noise control it provides, it is important to keep tolerance to a minimum.
   a. True
   b. False

10. Occupants in closed rooms:
    a. Have a higher expectation of privacy than occupants in open plans
    b. Will not benefit from the application of sound masking
    c. Have privacy if the room's door is closed
    d. All of the above

SPONSOR INFORMATION

Introduced in 2003 by industry leader KR Moeller, the LogiSon Acoustic Network is the world's first networked sound masking, paging and music system. TARGET software accurately tunes the masking sound to the specified spectrum, maximizing speech privacy and noise control. Worldwide distributors provide turnkey services and expert support. Visit www.logison.com.

ADVANCED HEATING TECHNOLOGY

APPLYING VRF IN COLD CLIMATES

Presented by:

MITSUBISHI ELECTRIC
COOLING & HEATING

Ceiling-recessed indoor units offer a sleek method of air distribution in separate zones of a building's interior space.

LEARNING OBJECTIVES

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

1. Identify how VRF heat pumps differ from traditional HVAC systems.
2. Describe what advanced heating technology is and how the technology works in VRF systems.
3. Describe the main benefits of using VRF heat pumps with advanced heating technology.
4. Identify how VRF systems contribute to the energy efficiency goals of buildings.

CONTINUING EDUCATION

AIA CREDIT: 1 HSW/LU
AIA COURSE NUMBER: AROCT2016.1

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/AR1016Course1 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

By Parker A. Grant, PhD

VARIABLE REFRIGERANT FLOW (VRF) HEAT PUMPS: AN IDEAL HVAC SYSTEM

Variable Refrigerant Flow (VRF) has been used throughout the world since the 1980s. In many countries, it is the most-used HVAC technology: for example in Japan VRF represents approximately 90 percent of installed systems within commercial buildings, Europe approximately 81 percent, and China approximately 86 percent.

Architects have favored VRF systems for many reasons, among them longer line lengths for more flexible design and the ability to mix and match indoor unit styles. VRF for commercial applications was introduced to the U.S. market in 2003. Since then, there have been major improvements in heating capabilities, space savings, and ease of retrofitting into buildings that were never designed to have air conditioning. Furthermore, advances have been made in the performance of the inverter-driven compressor, including improved energy efficiencies and reduced operational noise.

With so much to offer, it's no surprise that much of the world has taken to VRF. You can turn to VRF heat pumps for a multitude of reasons. From optimizing a building's exterior and interior space planning, to meeting the energy efficiency needs of your clients and comfort control demands of end users, VRF has the features that let your designs shine.

VRF achieves such success by dividing a building's interior into zones, each of which can be conditioned separately. For VRF with heat recovery, one room can even be cooled while another is simultaneously heated. In this case the exact required capacity is distributed to each indoor unit via a branch circuit controller. The result is superior personal comfort for occupants.

Design Challenges of Traditional HVAC Systems

Comfort trumps everything, but there are multiple kinds of occupant comfort to consider: feeling, seeing and hearing. A building must feel, look and sound good in order for occupants to enjoy their environment.

Most people recognize that no one wants to be in a building that's uncomfortable. It doesn't matter how beautiful or innovative the building is; if people don't want to be in it, it's ultimately not a successful project. This is a difficult truth for designers in a world of tantalizing projects and details.

When it comes to commercial buildings, architects face two main challenges when incorporating HVAC systems that bolster occupant comfort. The first is space. HVAC systems have traditionally been quite large, with outdoor units requiring ample square footage on rooftops or grounds and indoor units and ductwork consuming plenty of space in ceilings and plenums. This is bad news in a business focused on usable square footage. Ultimately an HVAC system should maximize an area, enabling you to create more useable space for your clients.

The other main challenge in designing an HVAC system for comfort is acoustics. You should avoid using a system that your client—or your client's tenants—will complain about. Loud outdoor units, noisy indoor units, and a vibrating structure are all problematic—and best avoided.

You can turn these design challenges into an opportunity, but it all starts with knowing your options. Armed with this knowledge, you can influence your clients, improve project performance, and make a significant difference to the end user. As a result, your client may be able to increase rental rates and deliver more useable square footage to building owners.

The Best Option: VRF Systems

VRF is an HVAC system that makes the most of square footage, acoustics, and budget while offering energy-efficient technology that provides outstanding comfort.

Compared to conventional HVAC systems—such as Variable Air Volume, Packaged Rooftop Units, Water-Source Heat Pumps, 4-Pipe Fan Coils, Packaged Terminal Air Conditioners, and Split Systems—VRF is highly favorable in every category:

- Comfort
- Total Installed Cost
- Efficiency
- Maintenance
- Architectural Impact

In addition, with as much as 40 percent of a building's operating costs tied to HVAC and other mechanical systems, it's important to minimize operating costs while achieving goals such as reliable performance, a modern aesthetic, and personalized comfort control. Because of this, VRF is the option that can bring flexibility to your building designs.

Design Flexibility with VRF Systems

VRF systems allow flexibility within your design since there is little to no ductwork involved. By reducing the plenum size, you can raise your ceiling heights leading to more stunning designs. The benefits are fourfold:

- A more spacious, modern feel
- Lower construction costs due to the possibility of designing shorter buildings
- More natural light and better indoor environment due to bigger windows
- The option to develop additional leaseable space

VRF enables you to reclaim usable square footage such as space that would otherwise go to mechanical rooms. This can also take the form of minimized wall penetrations, where two small pipes connect the outdoor unit(s) to the indoor units, thereby reducing installation costs and impact.

VRF's smaller footprint also means a lighter weight. In some cases, VRF systems can be 30 percent lighter than chilled-water systems. The implications are profound: ultimately, lower construction costs because installations of lighter systems require less structural support, reducing the amount of physical materials and labor required. You can even transport the outdoor units in a service elevator, potentially eliminating the need to rent cranes.

In addition, the exterior of a building is often reserved for the outdoor components of an HVAC system. VRF's modular and compact design reduces the size of the outdoor units versus traditional HVAC systems. This enables flexible design since outdoor units can be spread around a property or located together, placed inside or outside, such as in a mechanical room or in an alleyway.

A 4-way ceiling-recessed cassette can be used to provide a more spacious feel.

With many indoor unit styles and the ability to mix and match ductless and ducted options, you can design to your vision. Some of these indoor unit choices include:

- Wall-Mounted
- Low Profile Ceiling-Concealed Ducted
- High Static Ducted
- Multi-Position Ducted
- Floor-Standing
- 1-Way Ceiling-Recessed Cassette
- 4-Way Ceiling-Recessed Cassette

While VRF is in many cases an ideal HVAC option, heating in cold climates has historically presented challenges. Heat pumps have been troublesome in extreme cold climates. Below 17 degrees Fahrenheit, an auxiliary heat source, such as a gas-fired boiler, was needed to adequately heat a building. In many places throughout the country electricity was a much more accessible and affordable fuel than gas. The result was a technological gap—the need for heat pumps that could operate in even the coldest weather.

Today, those heat pumps exist. VRF heat pumps with advanced heating technology were developed to address these very issues, and heat pumps can now offer impressive performance in even the coldest climates—with no need for auxiliary heat. With advanced heating technology, your design flexibility increases. This saves end users energy, money, and maintenance headaches, which is excellent news for the building professionals who get called in every winter to solve cold-climate heating problems.

ADVANCED HEATING TECHNOLOGY: WHAT IS IT AND HOW DOES IT WORK?

There is currently no industry-wide definition of advanced heating technology since it is

Add a highly responsive VRF system with advanced heating technology to any building project, in any climate.

relatively new to the United States and only some VRF manufacturers offer it. Among those who do, a general definition of the technology is the ability to provide full rated heating capacity at zero degrees Fahrenheit (or below depending on the manufacturer) and offering substantial heating capacity at minus 13 degrees Fahrenheit.

Heating in Cold Climates

Historically, heating in cold climates has put industry professionals to the test. When it comes to heating indoor spaces—from office buildings to schools to health and wellness facilities—the challenge is to not just achieve the required heating, but to do it effectively and efficiently. Many heating systems don't perform as the temperature drops, causing end users to rely on auxiliary heat, and often on fossil fuels. These are both things an energy- and money-conscious market is looking to move away from.

An advanced heating technology system helps eliminate the need for additional fossil fuel burning or inefficient electric heating systems. That's better for the planet and your bottom line. Proven residential and commercial success with advanced heating technology has now extended to areas of the country where historically heat pumps just couldn't be applied.

How It Works

As the outdoor temperature drops below freezing, traditional heat pumps face decreased performance as the flow of refrigerant circulating through the system drops. In turn, this reduces the amount of heat generated. Advanced heating technology solves this problem with the addition of a flash injection circuit. This is accomplished by injecting a portion of the refrigerant into the compressor at a lower temperature than normal, reducing the temperature inside the compression chamber and enabling the compressor to run faster.

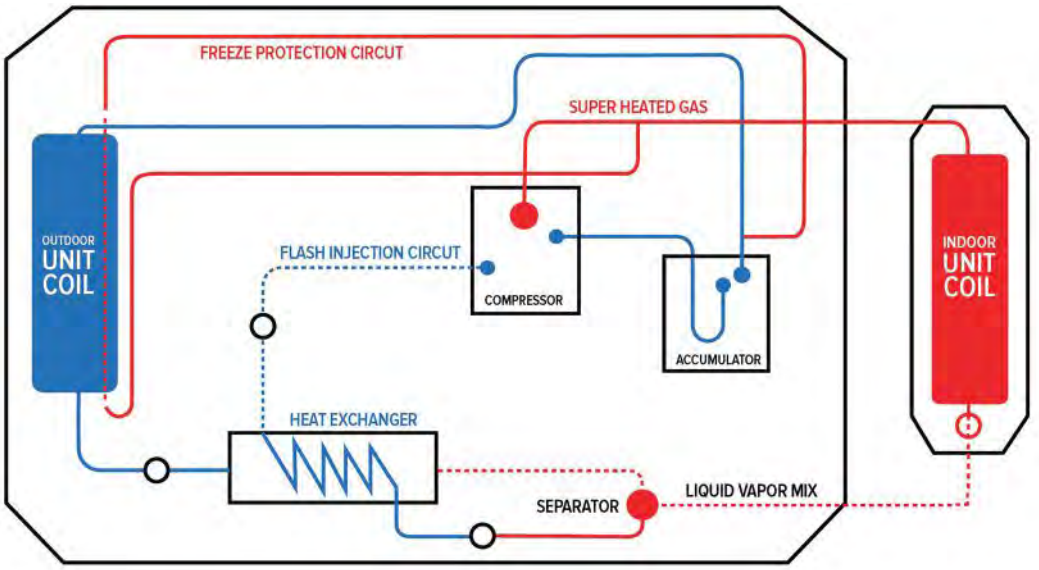
With the compressor running at higher speeds than normal, the system can maintain its heating capacity despite colder outdoor temperatures. This process is typically used in units over 24,000 Btu/h of capacity, and kicks in when the ambient temperature drops below 25 degrees Fahrenheit.

Here is a further breakdown of how the process works:

1. Outdoor unit in heating mode sends superheated gas to the indoor unit.
2. Gas becomes liquid/vapor mix inside the indoor unit and migrates to the separator.
3. Heat exchanger pulls remaining heat from liquid/vapor mix; mix becomes subcooled liquid.
4. Outdoor unit pulls heat from outside air to get liquid into gaseous form. In order for this to happen, the refrigerant must be colder than the air outside, making a freeze protection circuit necessary. For example, if the temperature outside is minus 10 degrees Fahrenheit, the refrigerant must be colder.
5. Flash injection circuit cools down compressor.
6. In the freeze protection circuit, a hot gas loop eliminates ice buildup.

The result of this technology is impressive heating capacity—100 percent at 0 degrees Fahrenheit and 85 percent at minus 13 degrees Fahrenheit, for example. In the case of VRF with heat recovery and advanced heating technology, simultaneous cooling and heating is generally available down to minus 4 degrees Fahrenheit (instead of the 14 degrees Fahrenheit associated with most manufacturers' standard version of VRF).

Having the ability to cool and heat at the same time during negative ambient temperatures is necessary in applications such as office buildings that need to serve both workers sitting all day (requiring heating) and occupants using gym facilities (requiring cooling) even as the temperature drops. Between minus 4 degrees Fahrenheit and minus 25 degrees Fahrenheit outdoor ambient temperatures, a VRF system with heat recovery and advanced heating technology will operate in heating mode only.



The advanced heating technology process uses a flash injection circuit to help the system maintain a high heating capacity despite colder outdoor temperatures.

A Closer Look at the Defrost Cycle

None of this, of course, would be possible without a defrost cycle. For VRF with advanced heating technology, defrost cycles help to:

- Stop the indoor unit fan motor, preventing cold air from being distributed into the conditioned space ("cold blow").
- Stop the outdoor unit fan, allowing the outdoor condenser coil to increase in temperature to more efficiently eliminate ice build-up.
- Operate the compressor frequency at a high speed, increasing the discharge gas' temperature.

A VRF system with advanced heating technology looks at three variables to determine when a defrost cycle should be initiated: outdoor ambient air temperature, cumulative compressor operating time, and outdoor refrigerant pipe temperature. The cycle auto-terminates either when the maximum defrost time is reached or when the outdoor refrigerant piping temperature has reached or exceeded a pre-set level for a pre-set amount of time (e.g., 50 degrees Fahrenheit for two minutes).

End users will find that defrost cycles occur more often when it's warmer out, for example 32 degrees Fahrenheit and snowing, than during periods of extreme cold with a lack of moisture in the air. Regardless of the temperature, end users likely won't notice the defrost cycle taking place at all. If the system stops heating during a defrost cycle, heat will only be absent for a few minutes.

Some manufacturers also offer a technology that creates heating capacity even during a defrost cycle. This happens by defrosting one section of the condenser coil at a time. The resultant operation shows a marked increase in heating capacity during defrost (from 0 percent to up to 60 percent depending on the outside temperature), as well as a small increase in overall heating capacity.

This technology takes different forms depending on the manufacturer. Some use hot gas defrost, others reverse defrost and others use a hybrid. With some manufacturers, a hybrid of hot gas and reverse defrost can take place in a single module, making the technology applicable to smaller projects.

While the use of hot gas defrost does increase the frequency of defrost cycles and make "cold blow" possible, it is still widely sought after for its impressive increase in heating capacity.

QUIZ

1. Compared to conventional HVAC systems, in which of the following categories do VRF systems excel?
   a. Comfort
   b. Total installed cost
   c. Efficiency
   d. Maintenance
   e. Architectural impact
   f. All of the above

2. _____ percent of a building's operating costs are tied to HVAC and other mechanical systems.
   a. 10
   b. 40
   c. 60
   d. 90

3. True or False: VRF enables designers to reclaim usable square footage within a building such as spaces that otherwise would go to mechanical rooms.

4. VRF systems can be _____ percent lighter than chilled-water systems.
   a. 10
   b. 20
   c. 30
   d. 40

5. True or False: Advanced heating technology is typically used in units over 24,000 Btu/h of capacity, and kicks in when the ambient temperature drops below 25 degrees Fahrenheit.

6. What is the heating capacity with advanced heating technology?
   a. 100 percent at 0 degrees Fahrenheit
   b. 85 percent at minus 13 degrees Fahrenheit
   c. 10 percent at 0 degrees Fahrenheit
   d. 100 percent at minus 13 degrees Fahrenheit
   e. Both A and B

7. True or False: In the case of VRF with heat recovery and advanced heating technology, simultaneous cooling and heating operation is generally available down to 14 degrees Fahrenheit.

8. What are the three variables used to determine when the defrost cycle should be initiated with a VRF system with advanced heating technology?
   a. Outdoor ambient air temperature
   b. Number of pipes in the boiler
   c. Cumulative compressor operating time
   d. Outdoor refrigerant piping temperature

9. True or False: VRF systems have the ability to treat hot and cold spots via zoning and simultaneous cooling and heating to ensure comfort for all.

10. True or False: VRF consistently performs at 25 percent higher efficiency than conventional systems.

This article continues on http://go.hw.net/AR1016Course1. Go online to read the rest of the article and complete the corresponding quiz for credit.

SPONSOR INFORMATION

MITSUBISHI ELECTRIC
COOLING & HEATING

Mitsubishi Electric US, Inc. Cooling & Heating Division (Mitsubishi Electric) is headquartered in Suwanee, Georgia. Mitsubishi Electric is a leading marketer of Zoned Comfort Solutions™ and Variable Refrigerant Flow (VRF) air-conditioning and heating technology in North America, Latin America, the Caribbean and Bermuda. In 1982, Mitsubishi Electric introduced its state-of-the-art, ductless air conditioners and heat pumps in North America and later expanded its product line with VRF zoning heat pump systems using INVERTER technology to offer simultaneous cooling and heating capabilities. The division also offers compressors and a full line of air-conditioning accessories.

WESTERN RED CEDAR

A PROVEN MATERIAL OFFERS SUSTAINABLE WARMTH FOR CONTEMPORARY ARCHITECTURE

Presented by:

Western Red Cedar adds warmth to contemporary design at CHS Field in St. Paul, Minnesota. Designed by Ryan A+E, Inc. and Snow Kreilich. Photo courtesy of Paul Crosby Architectural Photography.

By Kathy Price-Robinson

LEARNING OBJECTIVES

At the end of this program, participants will be able to:

1. Describe the uses of Western Red Cedar from ancient times, to modern designs.
2. Explain Western Red Cedar's sustainability designations and pathways to LEED certifications.
3. Identify design options for specifying Western Red Cedar in contemporary architecture.
4. List Western Red Cedar's proven performance characteristics.

CONTINUING EDUCATION

CREDIT: 1 LU/HSW

COURSE NUMBER: ARoct2016.3

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/AR1016Course3 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

To understand how architects and designers can bring natural warmth to modern architecture, you need look only as far as your local Crate & Barrel store. While each of the company's stores are different, each has a common aesthetic feature: a warm and welcoming chic, created with clean lines and the extensive use of Western Red Cedar, a soft, red-brown timber that has thousands of years of proven use.

The cedar features specified for each store vary. "It's used for exterior siding, interior paneling, and ceilings, and it's stained and painted," says Josh DeGuire, president of Specialty Wood Products (SWP), the Colorado-based company that is the sole cedar supplier for the global chain. Some of the newest Crate & Barrel outlets, all of which use Western Red Cedar as a design theme, are in such places as Russia, the Czech Republic, Dubai, and Indonesia.

The wood is shipped overseas to reinforce the chain's signature look.

Although Crate & Barrel mostly uses clear cedar, a brushed, knotty cedar is increasingly used to mimic barn wood for interior accents. For example, stores in Georgia and Florida employ this design choice. Annually, Crate & Barrel uses between 100,000 and 150,000 square feet of WRC.

WHERE MODERN AESTHETICS AND ANCIENT HISTORY CONVERGE

Today's design trends clearly indicate society's preference for sleek, minimalistic aesthetic. At the same time, contemporary architecture limited to glass, stone, steel, and stucco can feel cold or sterile. While clean, unembellished lines gain traction, a sense of nature via the use of wood is also sought after to evoke a connection to the natural world, a warm glow. And of importance to architects, it's a proven sustainable material.

The contemporary architectural aesthetic can feel cold or sterile. The addition of Western Red Cedar helps overcome that. This residence was designed by Ha2 Architectural Design. Photo courtesy of Houry Avedissian.

As a design guideline, there is evidence to indicate that we like some wood in our architecture, without going full-on log cabin effect.

The preference for some wood in interiors was revealed in a study on the effects of wood in hospital rooms, which was reported at the 2010 International Convention of Society of Wood Science and Technology, held in Geneva, Switzerland.[i]

For the study, hospital employees and patients were asked to rate digitally manipulated images of three rooms—1) one with no wood in the room, 2) one with wood on the floor and one wall, and 3) one with wood on all walls as well as the floor and ceiling. The preference? The room with wood on one wall and the floor was rated most pleasant, most natural, most calming, and most secure, and as the least boring room.

Western Red Cedar, long revered for its durability for exterior applications, is a natural choice for also warming up interiors. Imbued with decidedly crisp yet rich tonal properties, the wood not only creates beautiful outdoor environments, but also enlivens traditional home decor, provoking cutting-edge architecture and inspiring innovative interiors.

"Western Red Cedar is simply one of the world's most beautiful woods," says Paul Mackie, known as "Mr. Cedar" in the building industry. "No man-made material can duplicate Western Red Cedar's naturally luxurious appearance."

Finishes, which will be discussed later, include elegant dark stains, shabby chic bleaches, traditional solid colors and natural semi-transparent stains. Western Red Cedar also offers a wide range of sizes, surface textures and grades appropriate for many different applications.

CEDAR'S HISTORICAL SIGNIFICANCE TO CANADA'S FIRST NATIONS AND NATIVE AMERICANS

While currently trending in contemporary design, Western Red Cedar has a proven history of use and performance going back thousands of years. Photo courtesy of the Western Red Cedar Lumber Association.

While currently trendy, Western Red Cedar is not a new phenomenon. A large number of archeological finds indicates the widespread use of Western Red Cedar in ancient native cultures. It was used extensively wherever it was found along the northwest coast of North America, including British Columbia, Washington state, Oregon, Idaho and parts of Alaska.

Bark baskets woven in five different styles have been found near Vancouver, along with ropes and ocean-going canoes dating to 3000 years ago. Woodworking tools such as carved antlers, dating between 8000 and 5000 years ago were discovered in shell middens at an archeology site near Vancouver. Tools dating 4000 to 3000 years old have been found on the west coast of Vancouver Island. Wooden artifacts 1000 years old were unearthed on the east coast of Vancouver Island.

The cedar trees and their wood have deep religious values. In a book titled "Cedar: Tree of Life to the Northwest Coast Indians,"[ii] author Hilary Stewart mentions a legend among the native Coast Salish peoples that describes the origins of the Western Red Cedar. The legend focuses on a generous man who gave the people whatever they needed. When the Great Spirit saw this, he declared that when the generous man died, a great red cedar tree would grow where he is buried, and that the cedar will be useful to all the people, providing its roots for baskets, bark for clothing, and wood for shelter.

Native Americans of coastal Oregon to southeast Alaska also have a long history of using Western Red Cedar. Some northwest coast tribes refer to themselves as "people of the redcedar," using the original spelling, because of their connection with the tree for their basic needs. Roots and bark were used for baskets, bowls, ropes, clothing, blankets, and rings. The wood has been used for houses, boards, ceremonial objects, totem poles, masks, utensils, boxes, boards, instruments, canoes, and vessels.

Therefore, the specification of Western Red Cedar in contemporary architecture carries with it a deep and meaningful link to the history of native cultures.

WESTERN RED CEDAR'S CHARACTERISTICS

Western Red Cedar's scientific name is Thuja plicata. The name is derived from thujaplicin, a chemical substance that is found in mature trees and serves as a natural fungicide, thereby preventing the wood from rotting. Photo courtesy of Houry Avedissian.

The scientific name for Western Red Cedar is Thuja plicata and has one of the widest spread growth ranges on the West Coast. It is often found growing alongside Douglas Fir and Western Hemlock. It grows in lush forests and mountainsides, and also in many forested swamps and stream banks in its range.

Western Red Cedar is one of North America's great renewable resources. Slow growing and naturally durable, it has one of the longest life spans of any North American softwood. It produces various lengths of timber with true, straight grain.

Western Red Cedar's celebrated durability actually reveals itself long before harvest. A report by Connie Harrington of the U.S. Forest Service, an agency of the USDA, stresses that the tree tolerates shade very well. "Cedars have a reputation for surviving in the understory with (slow) growth," Harrington states. Further, the species' growth rates are likely to thrive, as accelerated climate change occurs. And it is "less susceptible to diseases than many other conifers." The trees can live for more than 1,000 years.[iii]

CASE STUDY: SANDY HIGH SCHOOL—CEDAR HELPS CAPTURE REQUIRED 'SANDY STYLE'

Because the buildings needed to last at least 75 years, the architecture firm of DOWA-IBI Group Architects decided on a proven, durable wood siding. Photo courtesy of Josh Partee.

The $79-million Sandy High School—which accommodates 1,800 students—opened in the fall of 2012 to replace a nearly 90-year-old structure half its size. The school has been described as a big building in a small town: 310,000 square feet for a community of just 8,000 people, halfway between Portland and the historic Timberline Lodge on Mount Hood, Oregon.

Organized as if it were an ancient Roman town, the school is comprised of two parts, one running a north-south axis (which serves as a corridor linking a gym, an auditorium, and a dining commons) and a 600-foot-long east–west axis (which leads to three classroom wings extending out to the south and to a double-height library to the north).

The new Sandy High School needed to exemplify the school district's commitment to quality education and be a center of pride for all communities within the district. In addition, the city's zoning code required that all new construction conform to the "Sandy Style," a local design standard meant to celebrate their position as the Gateway to Mount Hood and characterized by Cascadian architecture (which is English Arts and Crafts combined with Oregon Rustic), which was popular between 1915 and 1940.

The Oregon Trail School District was also adamant that the facility would impact the natural landscape minimally and be a model of environmental sustainability. This meant serious attention to building system performance but also building material performance, such as locally produced materials that would last the minimum 75-year life of the building.

Finally, the design needed to be economical to build and cost effective to maintain. Long term operational and maintenance costs are often the largest burden that public school districts face once their capital construction bond is spent.

In meeting the design requirements, the design team at DOWA-IBI Group Architects in Portland, knew early on they would need wood that was not only indigenous to the region but which had superior durability and was suitable for diverse applications.

The use of Western Red Cedar helped reinforce the desired modern Cascadian aesthetic. Photo courtesy of Josh Partee.

"The natural characteristics of Western Red Cedar came to the top very quickly," says DOWA-IBI principal John Weekes says when recalling the review of woods that could satisfy the design needs.

The modern Cascadian interpretation pointed to a design concept of heavy-timber frames, pitched rooflines and uncoated WRC board siding, complementing the rural, rustic ethos of the surrounding farm communities. Cedar was also used as roof decking (in three-to four-inch thicknesses) with exposed facing, as 8x8 quad posts, and for siding.

A whole-building sustainability plan was developed, ensuring the building included a long list of green building strategies. The goal was to "reduce the school's carbon footprint" and in the process achieve a LEED Gold certification. In this regard, Sandy High was equipped with passive and active solar panels, green roofs, geothermal piping and an air displacement system. The school's distinctive saw tooth roof brings sunlight into the gym, and skylights perform the same function in other locations. Where shading was needed, deep overhangs and a combination of vertical and horizontal cedar louvers were installed.

Much attention was placed on selecting materials that would last the minimum 75-year life of the building, patina over time and not tire, and require few resources to maintain. Western Red Cedar met those requirements with its natural resistance to moisture, decay and insect damage and because it can be installed, left alone yet look great over time. A key decision in this regard was to treat the cedar with bleaching oil to accelerate the aging process and give the timber the grey, weathered appearance that has become associated with the Cascadian style.

With such a large building, cost issues were magnified by the scale and quantity of material needed. DOWI-IBI staff pointed to the first-time cost effectiveness of cedar siding, the favorable natural weathering for long term maintenance and avoiding the high cost and high embodied and recurring energies of paint and coatings (an additional sustainability feature).

HOW WESTERN RED CEDAR FORESTS ARE MANAGED AND CERTIFIED

More than 85% of timberland in the province of British Columbia is certified by internationally recognized forest certification agencies. Photo courtesy of Western Red Cedar Lumber Association.

Western Red Cedar is found in the province of British Columbia and grows nowhere else in Canada. Western Red Cedar was declared British Columbia's official tree in 1988.

More than 85% of timberland in BC is certified by internationally recognized, independent,

This article continues on http://go.hw.net/AR1016Course3. Go online to read the rest of the article and complete the corresponding quiz for credit.

SPONSOR INFORMATION

The Western Red Cedar Lumber Association represents quality "Real Cedar" producers, distributors and retailers throughout North America. Founded in 1954 and known as "the voice of the cedar industry," WRCLA offers extensive resources to assist with selection, specification and quality standards. For more information, visit RealCedar.com

Course valid through October, 2019

QUIZ

1. First Nations and Native Americans have used Western Red Cedar's wood, bark, and roots for thousands of years. What have they used it for?
   a. Baskets, bowls, ropes, clothing, and rings.
   b. Houses, boards, ceremonial objects, totem poles, masks, utensils, boxes, boards, instruments.
   c. Canoes, and vessels.
   d. All of the above

2. Which global retail chain adds a warm aesthetic with Western Red Cedar in all of its 70-plus stores?
   a. Dick's Sporting Goods
   b. Williams-Sonoma
   c. Crate & Barrel
   d. L.L. Bean

3. According to a survey of hospital employees, which room design was rated most pleasant, most natural, most calming, and most secure, and as the least boring room?
   a. A room with no wood in the room.
   b. A room with wood on the floor and one wall.
   c. A room with wood on all walls as well as the floor and ceiling.
   d. None of the above

4. Where are Western Red Cedar forests *not* found?
   a. Central California
   b. Northwest coast of North America, including British Columbia
   c. Washington state
   d Parts of Alaska

5. When architects specified Western Red Cedar for the new Sandy Hill High School in Oregon, what reasons were given for that choice?
   a. Because it requires minimal maintenance.
   b. Because it has a proven history of durability.
   c. Because it's consistent with the area's rural, rustic design ethos.
   d. All of the above

6. What percentage of timberland in BC is certified by internationally recognized, independent, third party forest certification agencies?
   a. More than 45%
   b. More than 65%
   c. More than 85%
   d. 100%

7. When FPInnovations-Forintek, measured the environmental impact of various decking materials from cradle to grave, which materials substantially outperformed the others in every category?
   a. Brick
   b. Western Red Cedar
   c. Fiber cement
   d. Vinyl

8. Recently, the USGBC announced a new pilot credit for its LEED system that is designed to further advance environmentally responsible forest management and help rid buildings of illegal wood by promoting the use of wood that is verified to be legal. What is the name of that credit?
   a. Associated Compilation Protocol (ACP)
   b. Alternative Continuation Process (ADP)
   c. Ancillary Compliance Portal (ACP)
   d. Alternative Compliance Path (ACP)

9. What chemical substance found in Western Red Cedar trees acts as a natural fungicide, thereby preventing the wood from rotting?
   a. Creosote
   b. Thujaplicin
   c. Natural resin
   d. Fungnotine

10. One grade of knotty Western Red Cedar product is intended to be fully usable with the resawn face exposed to after trimming to fit the stud wall spacing. It contains no open characteristics or through defects. The product allows the use of adhesives on the reverse face to secure knots and is particularly well suited for factory priming or finishing. What is the common name for that grade?
    a. Architect knotty
    b. Knotty grade
    c. Pattern knotty grade
    d. Rustic grade knotty

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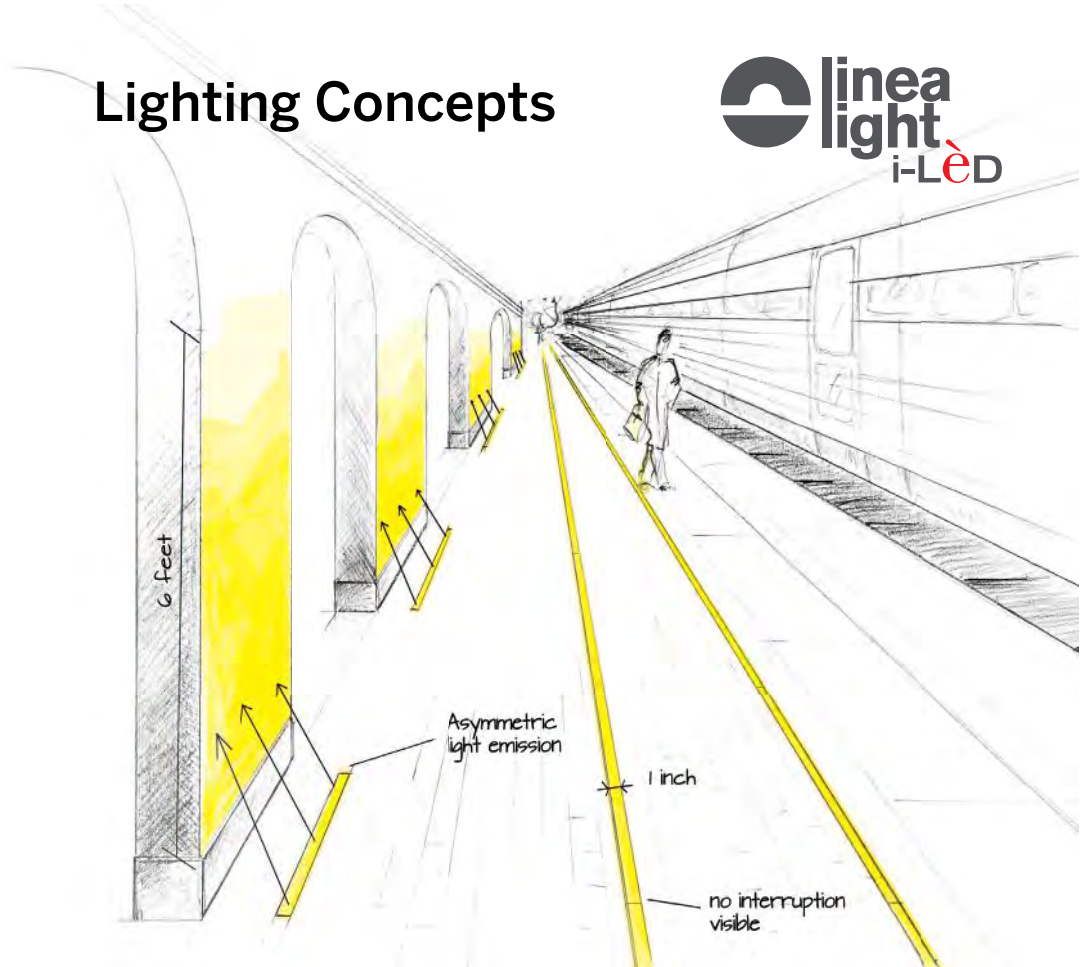

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“Cox is no longer doing triage. He’s not interested in sawing off limbs. If a neighborhood was deemed too far gone, he’s not denying it city services.”

A Visionary Planner Tackles Detroit by Karrie Jacobs

The first time I visited Detroit, five years ago, I got a grand tour one evening from one of the city's most tireless boosters, advertising exec and author Toby Barlow. He took me to an avant-garde piano concert in the hip neighborhood of Corktown, an artisanal pizza joint near Eastern Market, and, oddly, a wrap party for a Hollywood movie held at a soul food restaurant downtown.

During my trip I realized that if I tagged along with someone like Barlow, I could find a city that felt vital and urbane, a connect-the-dots puzzle of imagination and ambition, in which small-scale and entrepreneurial efforts were leading the way. There was an awakening here, but you had to know where to find it.

When I returned to Detroit this past September, I discovered a very different city. For one thing, for the first time in decades, Detroit is enjoying an influx of major new construction. Orleans Landing, for example, a 278-unit market-rate apartment development designed by the local firm Hamilton Anderson Associates, is nearing completion on a site near the edge of downtown, at the intersection of two popular bike and pedestrian trails, the city's River Walk and the Dequindre Cut. Just to the north, a pair of major developments are underway: City Modern at Brush Park, an architecturally ambitious 405-unit, 8.4-acre residential enclave and, practically next door, District Detroit, a massive 45-acre agglomeration of uses with a new hockey arena at its center. Both projects will boast easy access to the QLine, a 3.3-mile streetcar system along Woodward Avenue, Detroit's central spine, scheduled to open next year. The QLine is the city's first new transit since the downtown People Mover opened in 1987.

For another thing, Mayor Mike Duggan has hired the city's highest-profile planning director since Charles Blessing, who in the 1960s dreamed up a modernist remake of the city that was never implemented (although he did manage to lure Luwig Mies van der Rohe to town to design the beloved apartment and townhouses complex known as Lafayette Park).

A Phenom Named Cox

Architect and urban planner Maurice Cox moved to Detroit last year from New Orleans, where he was associate dean at the Tulane School of Architecture and ran its community-based design studio. Cox is considered to be a phenomenon within urban planning circles: smart, passionate, and inspiring. In 2003, when he was mayor of Charlottesville, Va., I interviewed him for a radio essay about democracy and architecture. We went to the historic part of the University of Virginia campus—he'd taught in the architecture school there—and talked about Thomas Jefferson. Then Cox impressed me by insisting we visit the pedestrian mall downtown and explained how that more workaday place also embodied Jeffersonian ideals.

Today, Cox works in an office dominated by a wall-sized map displaying Detroit's 100,000 or so publicly owned properties. "The green represents vacant land," Cox tells me. "The ones with the stars on it are properties that should be demolished, and other stars are properties that can be rehabbed."

During an hour-long conversation, Cox rattled off more ideas—all of them grounded in reality—than any one city could possibly attempt. Admittedly, many of the schemes he's setting in motion are an outgrowth of the plan initially called Detroit Works and later Detroit Future City, drawn up during the Dave Bing administration.

Maurice Cox at the Ideas City Detroit conference in April

JUSTIN MILHOUSE

Bing set out to save the city by lopping off its most abandoned portions. The idea was to divide neighborhoods into three categories—steady, transitional, and distressed. City services like street lights and ambulances would be enhanced at the steady end of the spectrum and removed from the distressed end. Then, in 2013, Detroit went bankrupt, and it elected Duggan. "Tens of thousands of people," Cox says, referring to Bing's plan, had already done a lot of thinking about "how the city should form around this question of the million-plus people that have left and are not coming back."

While Detroit's population is still shrinking—a city that peaked at nearly 1.9 million in the 1950s is now home to fewer than 700,000 people—the outflow slowed last year to a trickle; the city lost half a percent, or 3,107, of its residents. "People aren't moving out at anywhere near the rate they were," Mayor Duggan told the *Detroit Free Press*. "They are choosing to

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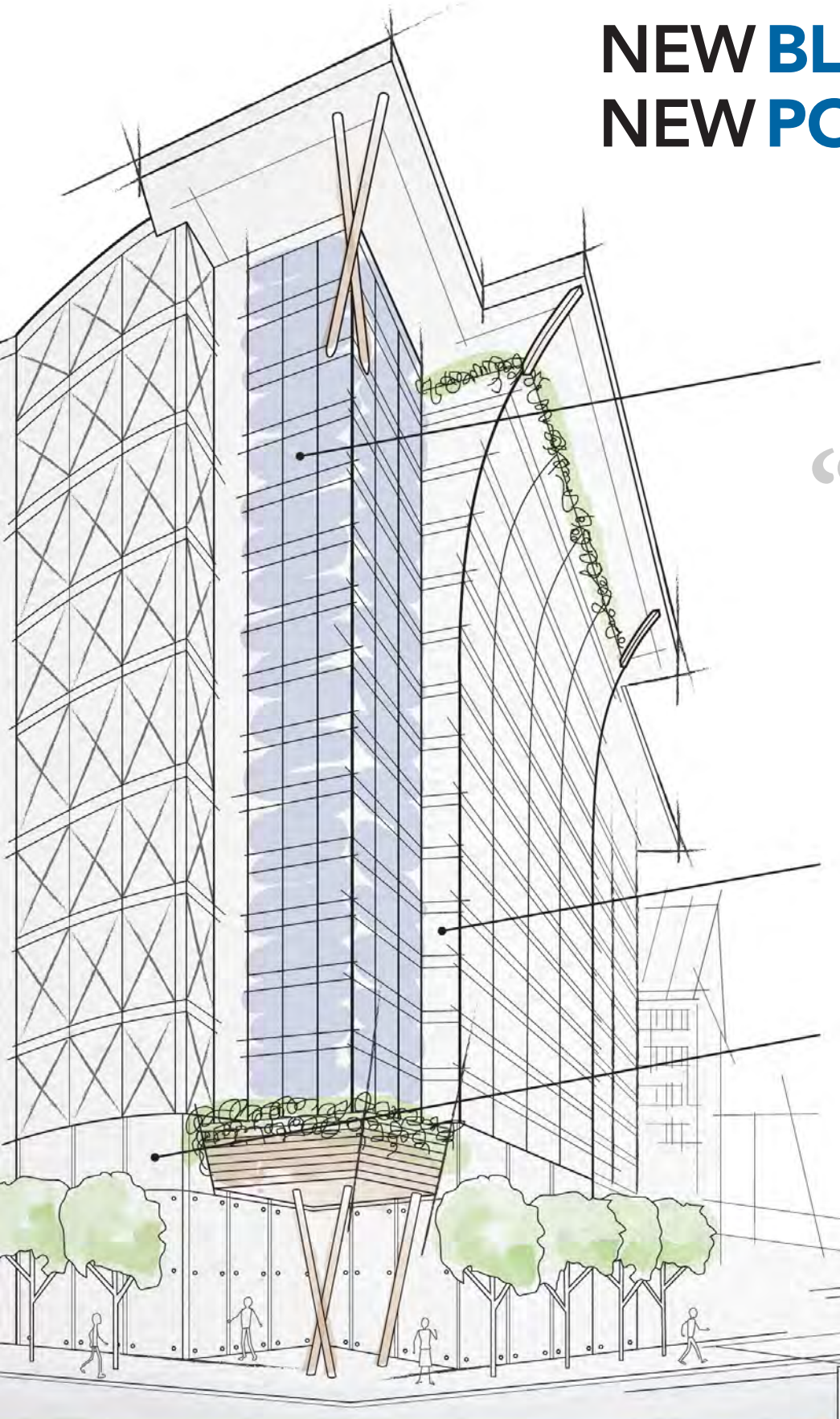

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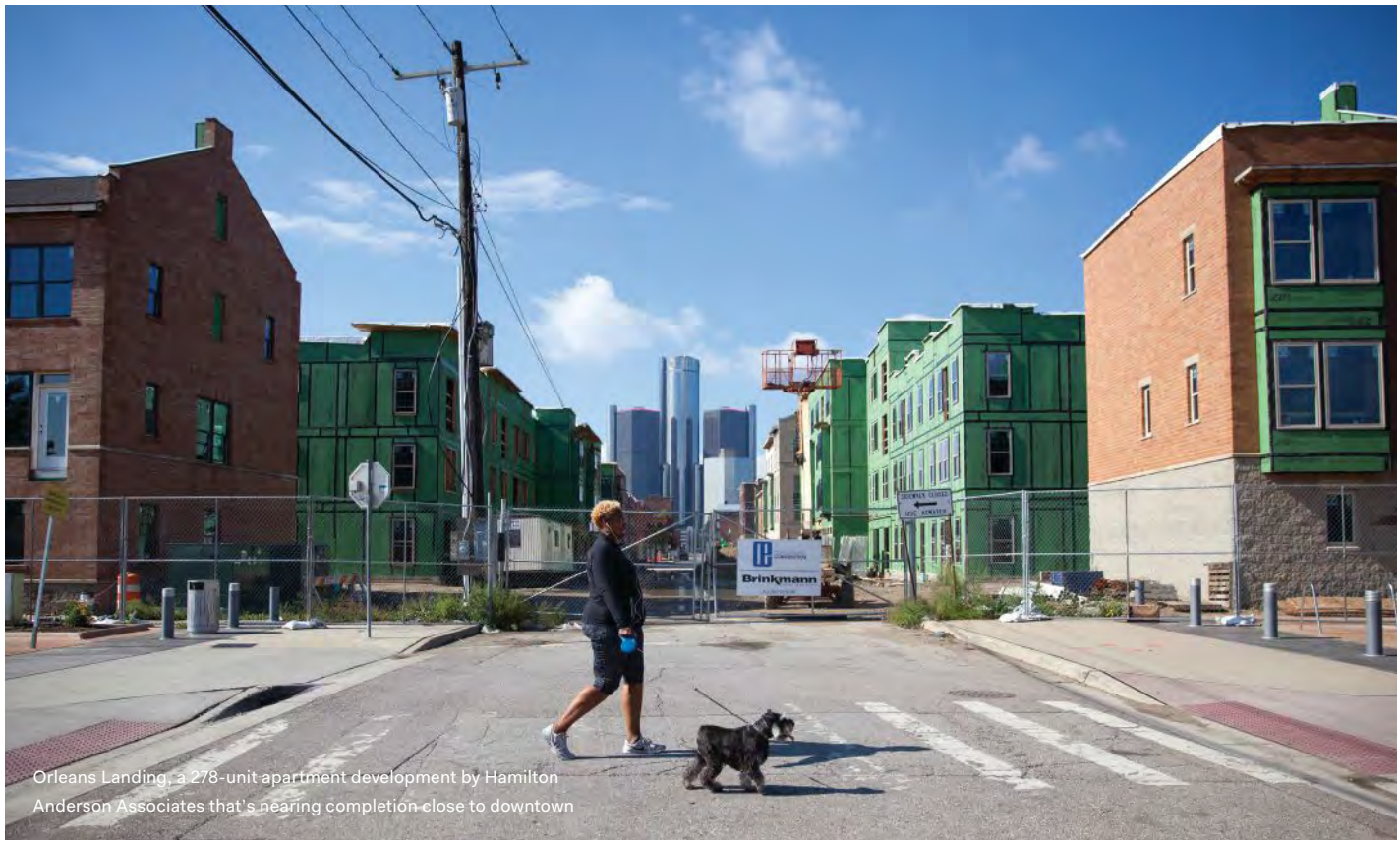
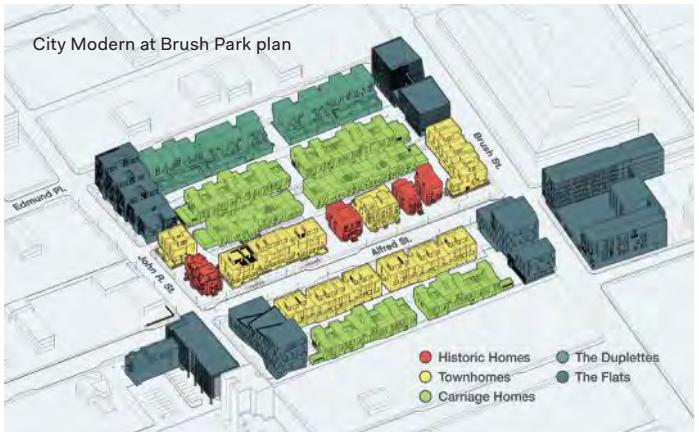


Orleans Landing, a 278-unit apartment development by Hamilton Anderson Associates that's nearing completion close to downtown

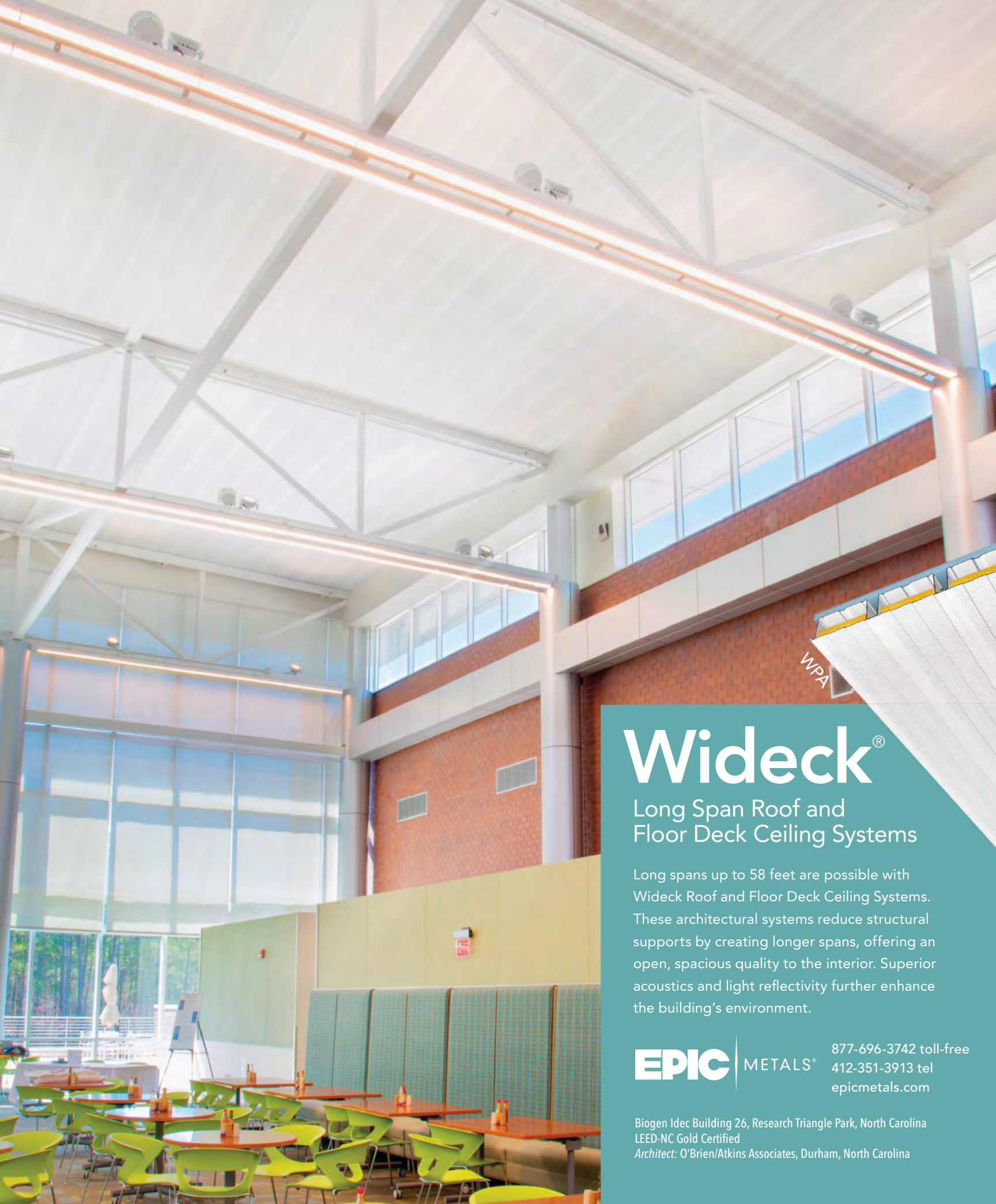
One of the existing historic houses on the City Modern site

City Modern at Brush Park plan



City Modern rendering

TOP AND BOTTOM LEFT: ERIK PAUL HOWARD



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stay. We're at a historic tipping point." According to the mayor, it's even possible that this year Detroit's population will grow.

A New Vision for Vacant Land

Cox's vision for the city reflects this change. He is no longer doing triage. He's not interested in sawing off limbs. If a neighborhood was deemed too far gone, he's not denying it city services. Rather, he's trying to pair it with an adjacent neighborhood that's doing better and finding ways to recast all that vacant land as an asset. To this end, Cox is methodically packaging 10 different areas around the city for revitalization, all of them beyond the perimeter of what locals call the 7.2—shorthand for the size, in square miles, of the downtown. The pilot project involves the blocks adjacent to the intersection of Livernois and McNichols, two commercial streets that are a mix of marginal businesses and vacant storefronts. And, of course, abandoned houses. Cox intends to restore most of them: "We basically are developing a strategy where we go out for a single housing developer who will come into the neighborhood and renovate 80 to 100 homes, secure them as long-term affordable rental," he explains. The idea is to increase the population of outlying neighborhoods without gentrifying them.

While Detroit's population is still shrinking, the outflow slowed last year to a trickle.

At the same time, Cox is working with a landscape architecture firm from New Orleans, Spackman Mossop and Michaels, on strategies for using vacant land: "We think we can use urban ag and other land-productive uses to regenerate the neighborhood," he tells me. He wants to encourage and make more visible the sorts of projects that are already happening on a small-scale basis: "They might be people who have a cut-flower business or people who want to grow crops. There are a host of those kinds of businesses, which are already happening, but they don't have a brand, they don't have a look. … We want to get it to a point where someone wants to live in a neighborhood because food is being grown there."

In July, Detroit issued a pair of RFPs for the Fitzgerald Revitalization Project, part of the larger Livernois/McNichols Corridor Revitalization Initiative. One RFP asked for a developer to rehabilitate 100 houses and the other to come up with uses for 257 vacant lots (13 submissions were received, and developers are scheduled to be selected this month). The document features surprisingly lovely renderings of how the vacant land might be used: a wildflower meadow surrounded by a white picket fence, an orchard with a picnic area, a field of hops, presumably for a local microbrewery.

Additionally, there's now a program, Motor City Match, to pair aspiring entrepreneurs with vacant commercial properties. The idea is to fill in the holes in commercial districts to make more viable neighborhoods. The things that are taken for granted in most other cities have to be retrofitted in Detroit: "Now we're starting to talk about the Motor City Main Street," Cox tells me. "So, could you get a cluster of businesses—you know, the coffee shop, the dry cleaners, the pharmacy, the family-oriented restaurants—all to cluster on these main streets if we improve the place-making of that street?"

Cox is also focused on reinventing more central parts of the city. He's got Skidmore, Owings & Merrill working on a master plan to transform a long stretch of land between E. Jefferson Avenue and the Detroit River, including 57 acres that were cleared in the 1990s for a massive casino development that never happened, into a string of transit-oriented, pedestrian friendly neighborhoods.

"A Great Time to Be an Architect in Detroit"

Meanwhile, another city-generated RFP was the impetus for what might be the most transformative new development, City Modern at Brush Park, which could dramatically upgrade Detroit's overall image. The developer is Bedrock Real Estate Services, founded by Dan Gilbert, who moved his company, Quicken Loans, to downtown Detroit from the suburbs in 2010. Since then he's snapped up some 95 properties in and around downtown, and has renovated and restored significant architectural works, such as Minoru Yamasaki's 1962 office building, One Woodward Avenue, and Albert Kahn's handsome 1915 Woodward Building.

More recently, Gilbert hired his very own planning guru, Melissa Dittmer. Formerly an architect at Hamilton Anderson Associates, Dittmer spent her last years there shaping the Detroit Future City project. In 2013, she was hired as the director of architecture and design for Bedrock, where she oversees the adaptive reuse of Gilbert's historic properties. For Dittmer, whose office in the Quicken Loans building looks out across an urban landscape she's rapidly remaking, "It's a great time to be an architect in Detroit."

By the time Cox stepped into his role at the planning department in 2015, the city had already issued an RFP for the 8.4-acre site in Brush Park. He

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arrived just time to help select the winning proposal: "We had everything imaginable," Cox recalls. "Developers who wanted to do faux historic buildings because it was in a really incredibly important historic district. The Bedrock team was certainly the smartest because they acknowledged that there was a kind of medium-density housing that was absent from the marketplace."

City Modern, arguably, is Gilbert's grandest undertaking. Acting as master planner, Dittmer carefully crafted an assemblage of housing types that will also incorporate four of the large, handsome historic homes for which Brush Park is known.

"We created diversity of residential typologies," Dittmer tells me. Her aim is to conjure up the kind of neighborhood "where people could age in place." She commissioned work from five different architecture firms, including a number of large rental apartment buildings (with stores on the corners) by Hamilton Anderson Associates and Los Angeles–based Lorcan O'Herlihy Architects. There's a set of "duplettes," cleverly interlocking duplexes, lined up in a row, by Boston-based Merge Architects, a firm that also designed carriage houses for the development, and townhouses by Chicago-based Studio Dwell Architects. While the new buildings have been scaled to harmonize with the four remaining historic houses, they are unabashedly modern in style.

Standing in the Bedrock offices examining the table-sized model of the development, I feel like I'm looking at one of those newly remade sections of Amsterdam. The development is sprinkled with rooftop terraces—"the 21st-century reinvention of the porch," according to Dittmer—and bisected by regular city streets and narrow mews. Parking spaces are included but, whenever possible, tucked away under an overhang. As much as it's possible in the Motor City, the development is designed to be walkable and transit-

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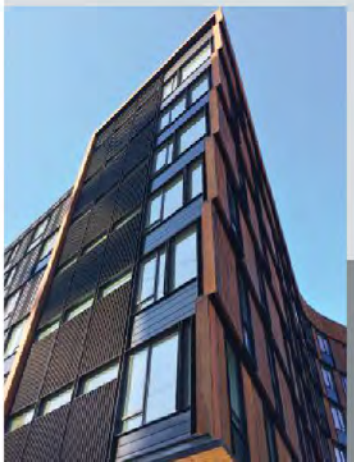

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oriented. "It's really a visionary notion about how different neighborhoods will be built, that you could create a traditional neighborhood where contemporary architecture could sit side-by-side with historic architecture," Cox says.

The Importance of Grassroots

There are other large developments in the pipeline, most notably District Detroit, which is an HOK-designed, publicly subsidized, $650 million, 45-acre, 50-block zone of sports (the new Red Wings hockey arena, plus the existing Comerica Park and Ford Field), entertainment, dining, and other uses. The developer, the Ilitch family, owns Little Caesars Pizza, which is constructing a headquarters on Woodward, in the middle of this new district; like Quicken Loans, Little Caesars is moving into town from the suburbs. The new headquarters (SmithGroupJJR is the architect of record) is distinguished by a façade with 14-foot tall triangular glass panels meant to evoke pizza slices.

And small architecture firms are continuing to take a grassroots approach to development. Brian Hurttienne, AIA, for example, has lived and worked in Detroit his entire adult life. "I started in preservation here in the 1980s," he tells me. "In some ways it was a lot better then than it is now. There were still over a million people."

He has lately reinvented himself as a design/build/develop architect. He bought up some vacant lots over the years, and is optimistic enough about Detroit's future that he wants to build on them. "My whole career has been in a down market. Today is the first time in my career that I can count on sustained growth doing Detroit projects."

Sustained growth, however, doesn't necessarily mean that it's easy to get things built. Doing new construction in a city that isn't accustomed to it can be tricky. Hurttienne's small partnership is attempting to develop several infill projects, mostly clusters of discretely modern row houses in neighborhoods like Corktown, near downtown, and further afield in West Village, a historic district not far from the Detroit River. Hurttienne has most of the financing lined up and is eager to begin, but he is encountering a form of NIMBYism: "Many people are questioning the

elements of design in historic districts, what qualifies as historic context, and therefore, what is appropriate for infill projects," he tells me. Because residential infill hasn't been done in Detroit in decades, Hurttienne wonders: "How are we to evaluate new product in existing environments? We've lost decades of gradual infill. Where do we go from here?"

Hurttienne should find it encouraging that Cox sees City Modern's combination of historic mansions and overtly modern new construction as visionary. Moreover, Detroit has a Knight Cities Challenge grant to experiment with something called "pink zoning," to create areas where the rules


Rendering of the District Detroit Little Caesars headquarters

are relaxed and red tape is scaled back to promote creative development. But change, even in a place that desperately needs it, takes time. "Just the idea of planning being the center of innovation and design is really kind of new for Detroit," Cox acknowledges.

Still, if Detroit is serious about transforming its 20-plus square miles of vacant land into an asset, and if it wants more than wildflower meadows and orchards, it should do everything it can to encourage small-scale, architecturally innovative developers, especially ones who are deeply committed to the city. After all, it was the risk-takers and entrepreneurs who have helped breathe new life into the Motor City. "There's a future here that's never been here before," Hurttienne says. Best to embrace it.

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“The exhibit doesn’t illuminate a simple narrative of Baghdad or a simple history of Chadirji’s work. Just the opposite. It points to the sites of tension and complexity.”

Iraq’s Modernist Architect by Zach Mortice

In a photo of a dusty, rubble-strewn Baghdad street, a group of men hold a rectangular object overhead. It resembles a casket, the unfortunate result of a drone strike, perhaps, or some other byproduct of the second Gulf War. But take a closer look and it becomes clear the photo is documenting something else entirely. In between the refuse and long metal supports of partially demolished buildings, concrete pavers have been salvaged and stacked into neat piles. And if the men are indeed holding a casket, the procession through the streets is subdued, free of any outrage at a bombing gone awry. This isn't a war zone; it's a construction site. The photo, taken in 1981, conveys a sense of chaos and urgency that American television viewers have learned to associate with war. But it actually depicts the turmoil of Baghdad's rush to modernization, when the state embarked on a redevelopment plan for the city center.

The photo was taken by Rifat Chadirji, Iraq's most prolific mid-20th century architect, who obsessively photographed his own buildings and everyday street life in Iraq. Born in 1926 in Baghdad, Chadirji studied architecture at the Hammersmith School of Arts and Crafts in London, and in 1952 he returned to Iraq to begin practicing. He named his firm Iraq Consult, which suggests how close he was to being something like an official state architect. "His buildings were important features of the state's administration and representation apparatus in the '60s and '70s," says Mark Wasiuta, director of exhibitions at the Columbia University Graduate School of Architecture, Planning, and Preservation (GSAPP). Along with his colleagues Adam Bandler and Florencia Alvarez Pacheco, Wasiuta curated an exhibition of Chadirji's photos, *Every Building in Baghdad: The Rifat Chadirji Archives at the Arab Image Foundation*, on display at the Graham Foundation in Chicago until Dec. 31.

The government ministries, business headquarters for state monopolies, and housing Chadirji designed epitomized modernity in mid-20th century Iraq, the projects largely paid for by the country's sudden influx of oil money. In 1978, after Chadirji refused to let President Ahmed Hassan al-Bakr use his Gulf State offices for intelligence purposes, he was jailed. Al-Bakr's successor, Saddam Hussein, released the architect in 1980 to work on the master plan for Baghdad. He fled Iraq three years later after securing a Loeb Fellowship at Harvard, and now lives in London.

The exhibition (Chadirji, now 89, did not participate) is curated from the architect's archives at the Arab Image Foundation, a nonprofit that collects vernacular photographs from across the region. It includes photos of his buildings and scenes of everyday street life, as well as work by his contemporary, the photographer Latif Al Ani. At the same time as his buildings were ushering Baghdad into the future, Chadirji was capturing snapshot ethnographies of life before the modern economy fully took hold: His photos depict religious ceremonies, Yazidi temples, pedicarts delivering handmade carpets, and pottery kilns dug into the earth.

The exhibit comes as the Graham Foundation is funding research on modern architecture and modernization in the Middle East, and follows the publication of *The Arab City: Architecture and Representation* (Columbia University Press, 2016),

The demolition of Baghdad's Haifa Street in 1981

edited by WORKac founder and GSAPP dean Amale Andraos. All these projects can help establish a foothold of knowledge about a part of the world that, despite our military involvement there, remains an architectural enigma. ARCHITECT spoke with Wasiuta about the exhibition.

Soon after Saddam Hussein freed Chadirji to work on a master plan for Baghdad, he fled Iraq. Why?

There are a number of photographs of the demolition of Haifa and Rashid Streets [in Baghdad]. Part of their historical fabric is demolished to make room for this new plan. So I imagine that's an uncomfortable position for Chadirji. He's released from prison in order to help plan the city; this is something he did in the early 1950s as well. But now 30 years later I'm sure he has a much different sense of what it means to be demolishing parts of Baghdad, especially part of its historic fabric, given that this is one of the fundamental points of his architectural theory, which is how to retain the Iraqi legacy through its buildings. That's probably in part why he leaves.

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An image of the exhibition

Intellectuals in Iraq were interested in processes of modernization that might foster a secular state. Yet, Chadirji may have understood that secularization comes with certain costs, including a loosening of social structures related to historical patterns of settlement, and also, possibly to religious institutions. One hypothesis is that Chadirji attempts to develop a building practice that carries references to local architecture in order to forge a different relationship to the past, and to produce a different, more inclusive notion of Iraqi collectivity.

He's familiar in the sense [of] his turn to historical references, which become an important feature of his work from the early '60s through the late '70s. [It's] very similar to the debates in Europe and America, the way in which a certain doctrinaire Modernism is challenged by various understandings of local city cultures and historical references.

To what extent was Chadirji willing to discard the past to build the future?

It's not like he was a Robert Moses figure who is interested in ripping through SoHo with freeways. In the 1950s he was responsible for the recording and maintenance of ancient structures in Iraq, so at the very beginning of his practice, he has a relationship to its historical texture and culture. [He understood that] as social structures change through increased wealth, patterns of living are going to change, because what we understand as "modernization" is the reorganization of patterns of habitation and social structures, and those have an imprint in the city. [They] were going to change, not because they were [an impediment], but because new economies would

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emerge, new forms of commerce would emerge, travel restrictions might loosen, and so on.

How much of Chadirji's work is still intact?

We don't know. We asked around, and just from information we've been able to gather, we have a list of something like 10 buildings we know have been damaged. To what degree they've been damaged, to what degree they've been restored, we can't ascertain.

The exhibition is an intensely austere archival experience, and there aren't many narrative threads to pull on. Why approach it this way?

Archives are not spaces of pure, easy communication. They have their own complex structure and opacity that you have to work through. [The exhibit] doesn't illuminate a simple narrative of Baghdad [or] a simple history of Chadirji's work. Just the opposite. It points to the sites of tension and complexity within his work, and his relationship to the city.

I would argue that the exhibition is as much about the Arab Image Foundation as it is about Chadirji. [The foundation] tries to assemble a history of the Arab world's photography through a certain type of document: vernacular photographs. This is a type of photography that is either functional or spontaneous. The documents are foregrounded [because] for us, that's what the exhibition is about. It's what information they contain, how they're structured, how they relate to each other.

Middle Eastern architecture is a blank spot for many Americans. What do you want people to get out of this show?

An important subtext is how architecture is a feature of the American enterprise in Iraq. Moreover, with Chadirji, the architecture of modernization in Iraq can be seen to anticipate conflict to come. There is a sense of vulnerability or fragility even in periods of rampant modernization.

It's also interesting to see the way in which the texture of the city that we are most familiar with through news recording and conflict footage is both similar to and distinct from the way in which Chadirji himself photographs it. So it's a kind of revision of the images of the city that have been so prominent in the West since 2003.

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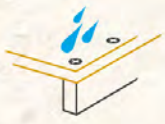

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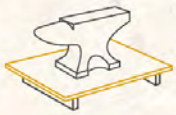

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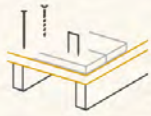

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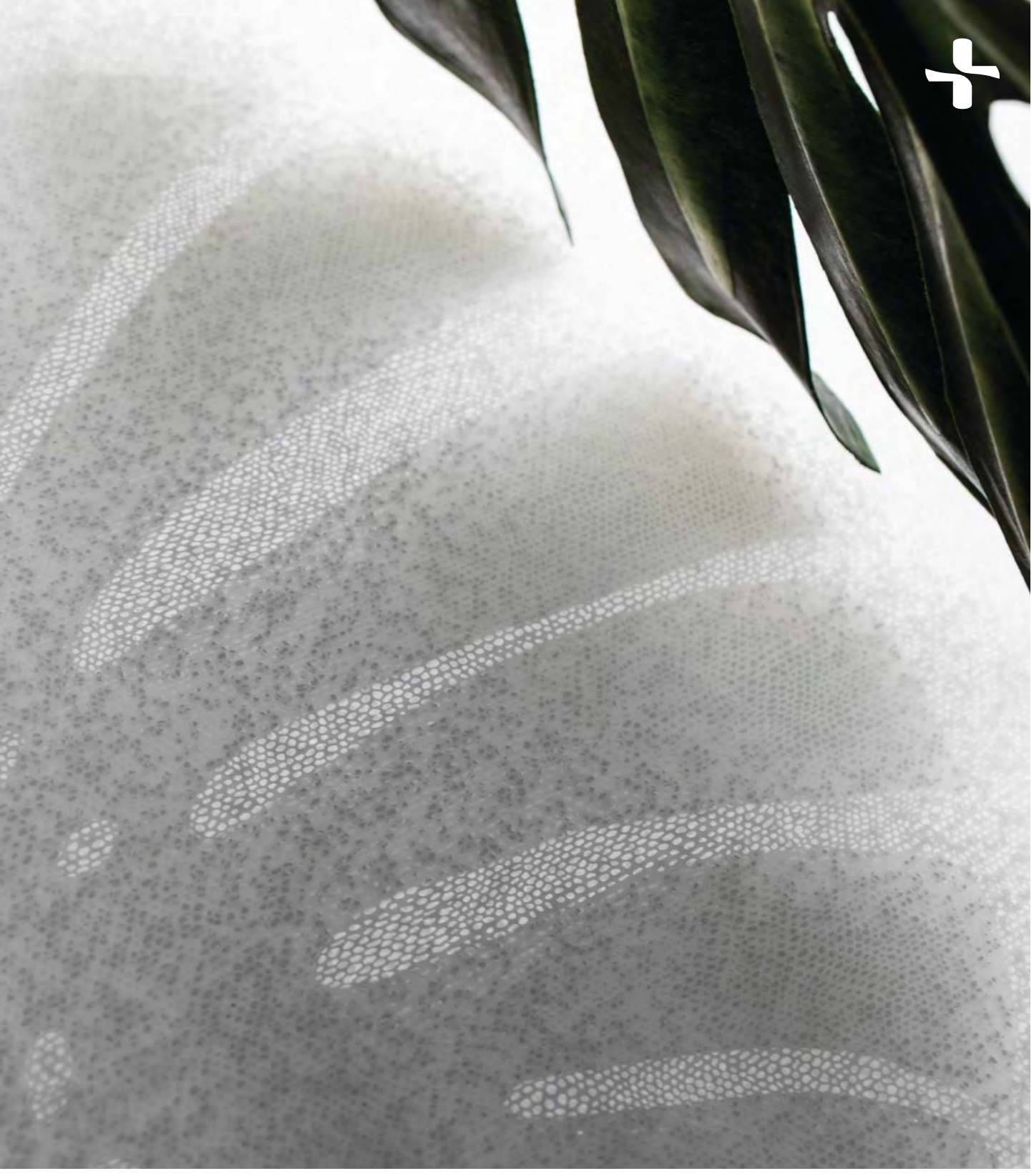

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“How much should you separate the physical museum from the charged politics around it? Can you criticize the architecture without impugning the museum’s larger mission?”

How the Critics Covered the NMAAHC by Amanda Kolson Hurley

In his book *The Seduction of Place* (Weidenfeld & Nicolson, 2000), Joseph Rykwert wrote that contemporary museums are "cult buildings of a global religion that offers the advantage and the disadvantage of imposing neither doctrine nor any rule of life." The morally improving Beaux-Arts museum has gone the way of the horse and buggy. Instead, museums today serve up a buffet of culture, and people can gorge or graze on it as they wish. At the same time, the architecture of museums has become increasingly assertive, with the goal of becoming an instant icon. The Broad in Los Angeles and the Tate Modern in London, to take two high-profile examples, have been accused of letting their architecture overshadow their collections.

The National Museum of African American History and Culture (NMAAHC), which opened in late September on the National Mall in Washington, D.C., breaks this mold. Its very existence reminds us of a stark fact many would sooner forget: that black Americans, who make up just over 13 percent of the country's population, were enslaved and oppressed for hundreds of years, and that it was white Americans who did the enslaving and oppressing. This invests the museum with a collective weight unrivaled by any other national cultural institution. The origins of the NMAAHC go back a century, to black Civil War veterans who first proposed a national memorial to "Negro achievement." The completed project inspires a sense of destiny fulfilled.

Nor is the building, by Freelon Adjaye Bond/SmithGroup, a stylish but neutral container. There is rhetoric in its profile: dark, modernist, and African amid the stalwart Neoclassical temples of the Mall. The story told in the underground part of the museum, in claustrophobic galleries, is heavy on human suffering and state-sanctioned injustice, with items like a slave auction block and an early photograph of an escaped slave's lacerated back. In the era of Black Lives Matter and near-daily reports of black men killed by police, the NMAAHC vibrates with uneasy relevance. The significance of the architecture only shrinks in proportion to the power of the exhibits inside and the currents of history and identity that pulse through it.

Political Posturing

The story the museum tells about its own making is more circumspect. After all, it had to get built—and that required political strategy in rule-bound Washington. In the years and months before the opening, Lonnie Bunch, the NMAAHC's founding director, stressed inclusivity, describing the project in interviews not as a black museum but as a "lens" for all audiences to understand the American experience. David Adjaye, HON. FAIA, and Philip Freelon, FAIA, the architects, stressed its contextuality, calling it a

A museumgoer peers through the Corona, the cast-aluminum panels that wrap the NMAAHC

ALEX FRADKIN

"knuckle" or "joint" between Washington's urban core and the pastoral landscape of the Mall. In truth, they designed an icon: a building that can be recognized from a few pen strokes. But downplaying its otherness was prudent, at least initially.

Early on, Adjaye dubbed the metal carapace of the building the "Corona" (crown), and this stuck, becoming official nomenclature. The metaphor is elegant, politically neutral, and aspirational, and possibly fended off negative characterizations that might have ensnared the design as it worked its way through a maze of approvals.

Writing about the museum was more of a tightrope than usual for architecture critics. How much should you separate the physical museum from the history that led up to it and the charged politics around it? How far can you step outside the official story, which has been shaped and honed since 2009? Can you criticize the architecture without impugning the museum's larger mission?

Near Universal Acclaim

As it turns out, the reviews have been almost uniformly positive. Oliver Wainwright of *The Guardian* played up the building's alienness, finding "joyous glee" in how it rejects the somber traditionalism of the Mall and catching in the pattern of the Corona "a slightly sci-fi air." Other critics identified a push and pull between standing out and fitting in. Christopher Hawthorne of the *Los Angeles Times* called the museum enigmatic, "aloof and standoffish in certain ways and carefully contextual in others."

The Corona inspired praise for its darkness and mutability, and critics anointed it with no shortage of metaphors: a lampshade (*The Wall Street Journal*), a pagoda or spaceship (*The Guardian*), "a box pulled from the ground" (*Los Angeles Times*). There are a few quibbles: that the Corona was fabricated from coated aluminum rather than real bronze, which "feels assembled … more than crafted" (*The Observer*); and that the support structure of panels is "ponderous" (*The Washington Post*).

Alexandra Lange of Curbed discerns political calculation behind the omission of Modernism from the official story of the design. "While the architects acknowledge a whole range of 20th century influences, starting with Marcel Breuer's Whitney Museum, one intuits that's not how you get a museum built in the nation's capital," she writes. "Better to start by connecting the dots between contemporary architecture, 19th-century Washington, and older, vernacular traditions from the Southeast and from Africa."

The pop culture gallery at the NMAAHC

A Reconstruction-era house from a freedman's settlement

Lange starts with the architecture, then zooms in on the exhibits. But some critics felt the architecture was secondary, given the historic mission of the museum ("fraught" appears in at least two reviews). Rowan Moore of *The Observer* in London is explicit on this point: "It is indeed the content that should come before the architecture of the building that serves it." Moore doesn't directly discuss the building's design until the 11th paragraph of his review, and you can sense his fatigue with the much-trotted-out official story. ("[It] is already much told and doubtless will be repeated to the museum's visitors for as long as it stands.")

What did the critics miss? The oculus-lit Contemplative Court, one of the museum's most dramatic spaces, is skimmed over—probably because it wasn't open on the press preview day. Only some stories note the missing set piece Adjaye originally planned for the atrium, a "shower of timber" suspended like stalactites from the ceiling, which got value-engineered away. Nor are there many mentions of the museum's anticipated LEED Gold certification. One can imagine a different museum, one with a less

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The oculus-lit Contemplative Court

ERIK COX

compelling back story, making this its calling card ("the greenest museum on the Mall").

I'm also not aware of any reviews that relate the museum to Adjaye's two much-praised local libraries in D.C.—one of which has a similar jewel-box exterior—or the four prior museums that Freelon designed with African-American themes (the Reginald F. Lewis Museum in Baltimore, the Harvey B. Gantt Center in Charlotte, N.C., the National Center for Civil and Human Rights in Atlanta, and the Museum of the African Diaspora in San Francisco). The elision of Freelon and Adjaye's past work from the coverage has the effect of making the NMAAHC seem even more singular, *sui generis*.

Perspectives Beyond Architecture

The vast majority of the writers who have covered the museum as a work of architecture are white (myself included), a sad echo of the homogenous nature of the architectural profession and its critics. Fortunately, because of its historic importance, the project was widely covered across the national media, including by black writers outside the niche of arts journalism. Greg Carr, a professor in the Department of Afro-American Studies at Howard University, reviewed the museum for *Ebony*. He notes that Jefferson Davis, later the president of the Confederacy, was a founder of the Smithsonian, and he conjectures that this museum opening, "complete with a ribbon-cutting ceremony

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by a U.S. president of African descent, would undoubtedly have stupefied the Confederacy." Carr is one of only a few writers to observe a neat trick of Adjaye's—by setting the sides of the Corona at the same 17-degree rake as the tapered Washington Monument, the architect underscores the African origins of both buildings (the obelisk is Egyptian after all), and subtly Africanizes this part of the National Mall.

The gesture is even more powerful when we learn, from Ayana Byrd in *Fast Company*, that, "For its first 72 years as the nation's capital, Washington, D.C., was a slave territory, and the 5-acre tract on which the new National Museum of African American History and Culture sits once contained a slave market." Byrd jolted me to attention with this lede to her story, the image of slave pens coexisting with the U.S. Capitol and the White House a reminder of how thoroughly parts of American history have been scrubbed not just from textbooks, but from the landscape.

Race, not as an abstract concept but a lived experience, is front and center in much of the writing on the museum by black writers, and often shapes their understanding of the architecture. In his review of the NMAAHC ("How a Museum Reckons With Black Pain"), Vann Newkirk II of *The Atlantic* takes issue with a complaint made by Philip Kennicott, of the *The Washington Post*, that the history exhibit has been "relegated" to cramped subterranean galleries. Newkirk counters: "The underground placement of the history exhibit is probably better described as a purposefully subversive use of space," because "viewers are essentially deposited into the bowels of the slave ships that stole so many souls from the African coasts."

Whereas Kennicott finds the density of information accompanying the exhibits a flaw, Newkirk says it's necessary because black history is so woefully neglected. If visitors feel overwhelmed, well, good, Newkirk writes: "The mission of the exhibits seems not to always be to 'clarify and teach,' as Kennicott hopes, but to impress upon viewers just how much they don't know, and how deeply the grand conspiracy of white supremacy runs."

Sonya Ross, in an Associated Press story, offers a first-person account of a journey through the museum. She starts out numb, even when confronted by the most chilling artifacts of slavery: "The [police] killings have drained my emotions to the point where I hardly have any feelings left." As she moves through the galleries, she has hushed conversations with other women of color, some of them friends, some strangers. Her experience is collective as well as personal, and the injustices of the past mingle with those of the present.

In *National Geographic*, Michele Norris, the

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former NPR host, describes the Corona as part of a particular, "flamboyant" African-American tradition: "Church hats. Zoot suits. Cornrows. Bling. Situated at the gateway to the rows of stately Smithsonian buildings on either side of the National Mall, it's as if Beyoncé, in one of her bejeweled costumes, strutted into a Wall Street meeting filled with gray suits."

Comparing the NMAAHC's arrival to Beyoncé crashing a meeting of bankers is a vivid and unexpected analogy, with a political undercurrent when you think about it (in the film accompanying Beyoncé's 2016 album *Lemonade*, the mothers of Trayvon Martin and Michael Brown appear holding pictures of their dead sons). This is not Lonnie Bunch practicing the art of diplomacy.

Respectability Politics

The only really negative assessment of the museum (at least that I've seen) comes from a black writer named Steven Thrasher. In *The Guardian*, Thrasher says blackness should not need validation with a pretty building on the National Mall. He regards the museum's architecture as part of the problem: "I worry that the museum is playing into a central trap of respectability politics: that if we just present ourselves in right way—on the National Mall! with a modernist building!—black lives will be seen as worthy." By this reading, the Corona is not a celebration of black culture but a cop-out.

I'm not persuaded by Thrasher's argument. But I also wouldn't have grappled with his stance and experience of the space if not for his review (as Adjaye told the *The New York Times'* Michael Kimmelman, "The experience of being black is not a fiction"). This is why the lack of people of color who write regularly about architecture is a problem. The unusual breadth of takes on the NMAAHC—including an intimate use of the first-person voice not often found in architectural writing—reveals new possibilities for a field where the cool-eyed appraisal of a building as an aesthetic object remains an ideal.

Across media outlets, most articles about the museum had one depressing thing in common, whatever their style or take. Their comments sections overflowed with ugly rhetoric about racial favoritism ("Where's the WHITE museum?"), accusations that African-Americans are playing victim, and even defenses of the institution of slavery. As moving as it is, the museum is only the beginning of the work America has left to do to reckon with its original sin.

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The Tall Building

Psychoanalytically Considered

TEXT BY NED CRAMER

A different painting by Madelon Vriesendorp opens each section of *Delirious New York*, Rem Koolhaas, HON. FAIA's psychoanalytic profile of architecture in the city's heroic age. The most well-known of Vriesendorp's pictures, *Flagrant Délit* (*In the Act*), appeared on the cover of the first edition. It depicts an anthropomorphized 30 Rockefeller Plaza discovering the Chrysler Building and Empire State Building in a state of post-coital bliss, with a used condom drooping over the edge of the bed like Salvador Dalí's famous melting clock.

Vriesendorp, who was Koolhaas' spouse and partner when *Delirious New York* was published, in 1978, called the series of paintings "Manhattan." "The Secret Life of Skyscrapers" would do just as well, given Koolhaas' thesis—that the architects and developers of pre–World War II Manhattan, especially its idiosyncratic pre-modernist high-rises, subconsciously channeled the inner desires of everyday citizens.

Koolhaas bemoaned the commodification of postwar towers, "the brutal skyward extrusion of whatever site the developer has managed to assemble." One of the great architectural enterprises of our current age, readers of *Delirious New York* can surmise, is to restore weirdness and joy—in a word, meaning—to cities and skyscrapers. As Koolhaas puts it, "Manhattan's architects performed their miracles luxuriating in a self-imposed unconsciousness; it is the arduous task of the final part of this century to deal with the extravagant and megalomaniac claims, ambitions, and possibilities of the Metropolis openly."

In a sense, the projects in this issue of ARCHITECT are love children of Vriesendorp's Chrysler and Empire State (condom notwithstanding). All six buildings, and their architects, upend the high-rise paradigm, albeit in different ways: typologically, structurally, materially, programmatically, diagrammatically. These are no mere brutal skyward extrusions, but towers that are highly self-aware, and more than a little delirious.

MADELON VRIESENDORP

Diller Scofidio + Renfro, working in collaboration with **Gensler**, builds a vertical community for Columbia University medical students at the **Roy and Diana Vagelos Education Center** in **New York**.

TEXT BY JOSEPH GIOVANNINI

PHOTOS BY NIC LEHOUX

It may seem a slam dunk for a clinic to look clinical, but at least for the planners of the new medical teaching facility at Columbia University Medical Center in New York, they understood the limits of the paradigm and challenged it. Administrators were intent that the new Roy and Diana Vagelos Education Center be a supportive, transformative environment for teaching and learning medicine, and they wanted more than compact, high-gloss rooms on either side of a double-loaded corridor. Of course, the 100,000-square-foot, 14-story glass tower needed bright, clean teaching spaces for dissecting cadavers. Ditto for high-tech spaces that simulate operating rooms, complete with surgical equipment and patient dummies.

But in the context of pursuing a more holistic pedagogy, administration planners wanted to address the whole student in a more engaging environment. In study areas and common spaces outside hardcore exam rooms that truly required sterility, they wanted a more humane environment that spatialized theories of collaborative learning. The traditional classroom and lecture format assumes a passive transfer of knowledge between faculty and students, but new pedagogies in medical education instead put an emphasis on participatory, problem-based learning that improves teamwork and critical thinking.

In 2010, Columbia Medical Center held a competition to reshape the look and feel of its education building. Educators enlisted architects to reinvent how medicine would be taught, learned, and practiced in the 21st century. But there was an elephant in the room: The sterility assumed necessary in hospital settings is itself a dehumanizing agent, and that sterility, almost as a style, has invaded many (if not most) corners of medical complexes. Med students undergo grueling routines, enduring long hours in a succession of low-ceilinged boxes that, over the years, test the senses, patience, and sanity, of overworked, sleep-deprived students. Medical school is an endurance test unnecessarily aggravated by design. Sterility as an ethos may be pervasive, but it's desensitizing and silently counter-productive.

New York architects Diller Scofidio + Renfro (DS+R), working in collaboration with Gensler, changed all that with the new Vagelos Education Center in Washington Heights, at the north end of Columbia's medical campus. Their strategy was simple: separate the public spaces and functions from the clinical spaces, and collect and stack them into what is effectively a vertical campus—and one with buzz.

DS+R applied ongoing design research in what was, for them, a new institutional typology. The interdisciplinary design studio has long studied

Previous Spread: View from east

Above: View from south

how to pedestrianize tall buildings by creating spatially complex sections with ramps, stairs, and individuated spaces that favor diversified, networked space. In their recently opened McMurtry Building for the Department of Art & Art History at Stanford University, the design team, headed by partner Charles Renfro, AIA, looped students in paired interlocking wings that spiral up around a courtyard. In Rio de Janeiro, at the Museum of Image & Sound, DS+R continued the Avenida Atlantica up the building in a series of switchback paths that activate the façade and deliver the beach-going crowd to the roof for drinks and free movies. For an interdisciplinary firm that has specialized in wry social commentary and conceptual art installations, the paradigm of a sectionally active, networked building has been a way to develop a language without resorting to formalist signature.

Now, no doubt about it: The new Vagelos Education Center has huge curb appeal. Pedestrians regularly stop on this otherwise uneventful street to gaze up at the jumbled glass façade. Even given the signature condo towers now populating downtown neighborhoods, the design is unique in the city.

The lead southern façade of the rectangular tower resembles a honeycomb after an 8.0 earthquake. In what looks like forced perspective but is really a building shaped by zoning set-back laws, the façade tapers back as it rises, creating an illusion of speed and disappearance. The building rises in disciplined, rhythmic irregularity, the glazing interrupted by angled stairways and several open-ended boxes that pop through the glass, two of which are outdoor terraces. Not since Paul Rudolph's Art & Architecture Building at Yale has a building turned its own corners with such porosity, complexity, wit, and IQ. This is a playground of space, form, and glass—and it's smart.

The façade that is so extroverted and charismatic on the outside was, in fact, designed from within. The architects strategized the internal layout by placing the elevator core a third of the way into the block, zoning the building so that the rooms requiring separation are north of the core, in a regular bread-and-butter part of the building with a conventional section. Construction efficiency on the northern two-thirds of the structure paid for the complexities of the rest.

South of the core the architects organized public spaces into a concatenated vertical plaza of open and closed classrooms, lounges, huddle spaces, outdoor terraces, and computer banks—spaces whose functional fungibility allows them to be colonized by students convening spontaneously or by arrangement. The students can work together, hang out, study solo, or take a breather on a terrace with a view.

"We wanted to scatter spaces of different scale, and plotted an internal topography of plateaus connected vertically," says founding partner and partner-in-charge Elizabeth Diller, who worked on the commission with project director Anthony Saby. "These unprogrammed spaces are large and small, intimate and communal, interior and exterior, some with acoustic control, some with food, and some with built-in technologies."

"It's a cascade of spaces," she continues, "linked by a communicating stair that threads its way through every level of the tower. Most medical education buildings are low, densely packed, and symmetrically organized, and we wanted to create a form of 'productive inefficiency' through a network of exuberant, airy, light-filled spaces that the students could take over without inhibition."

The architects organized the vertical campus into four stacked neighborhoods defined by fire enclosures. The spaces always tie back to the core, which provides accessibility, but are also networked with stairways that meander up and down the vertical campus on a path of discovery. The journey starts at the entrance on the ground floor, a bright, open field of space offering food, a lounge, and dining area, and leads up to a 275-seat auditorium on the next floor, before continuing up into the stacked neighborhoods.

Besides transforming the building into a catalyst for social interaction, the architects operate on the normally closed, usually intractable typology of the stacked and sealed high-rise, opening the tower to itself and to the outside. Panoramic windows, differentially fritted for sun control, give the students views of the Manhattan skyline to the south and the Hudson River to the west, relieving the compounded hermitic tendencies of a high-rise and a medical school.

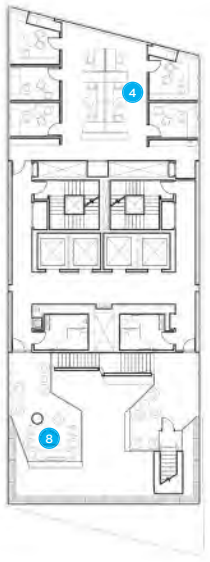
Having spatially informalized the building with their cascade, the architects warm the building materially, mixing generous amounts of Douglas fir paneling on all levels. The architects took every opportunity to relax the building, breaking the stiffness and chill of extrusion. Even the glazing follows its own logic, with no two floors of glass alike.

The building is functional, but has a high joy index that offers students an experiential dividend. "We designed the building to support this informal learning model in which work and social life are blurred, and students have a lot of freedom to select environments with attributes that appeal to them," Diller says.

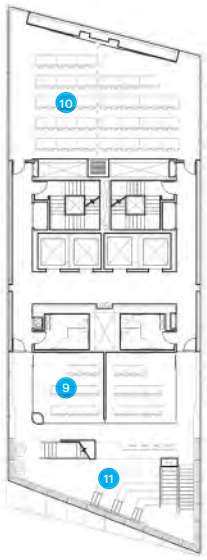
Long ago, Vitruvius advised that a building should embody firmness, commodity, and delight. The Vagelos Center certainly checks the firm and commodious boxes, and against all typological odds, it scores very high on delight.

Fifth-Floor Plan

11th-Floor Plan

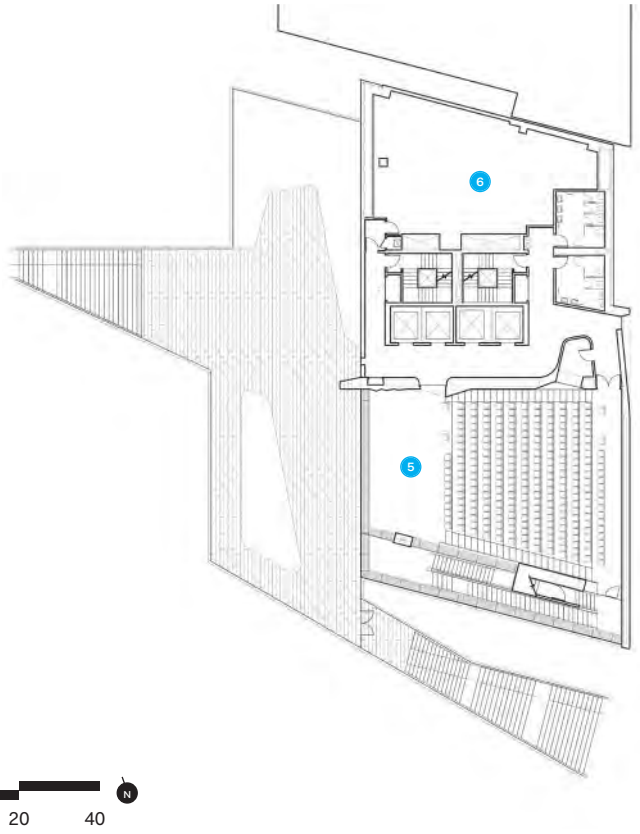


12th-Floor Plan



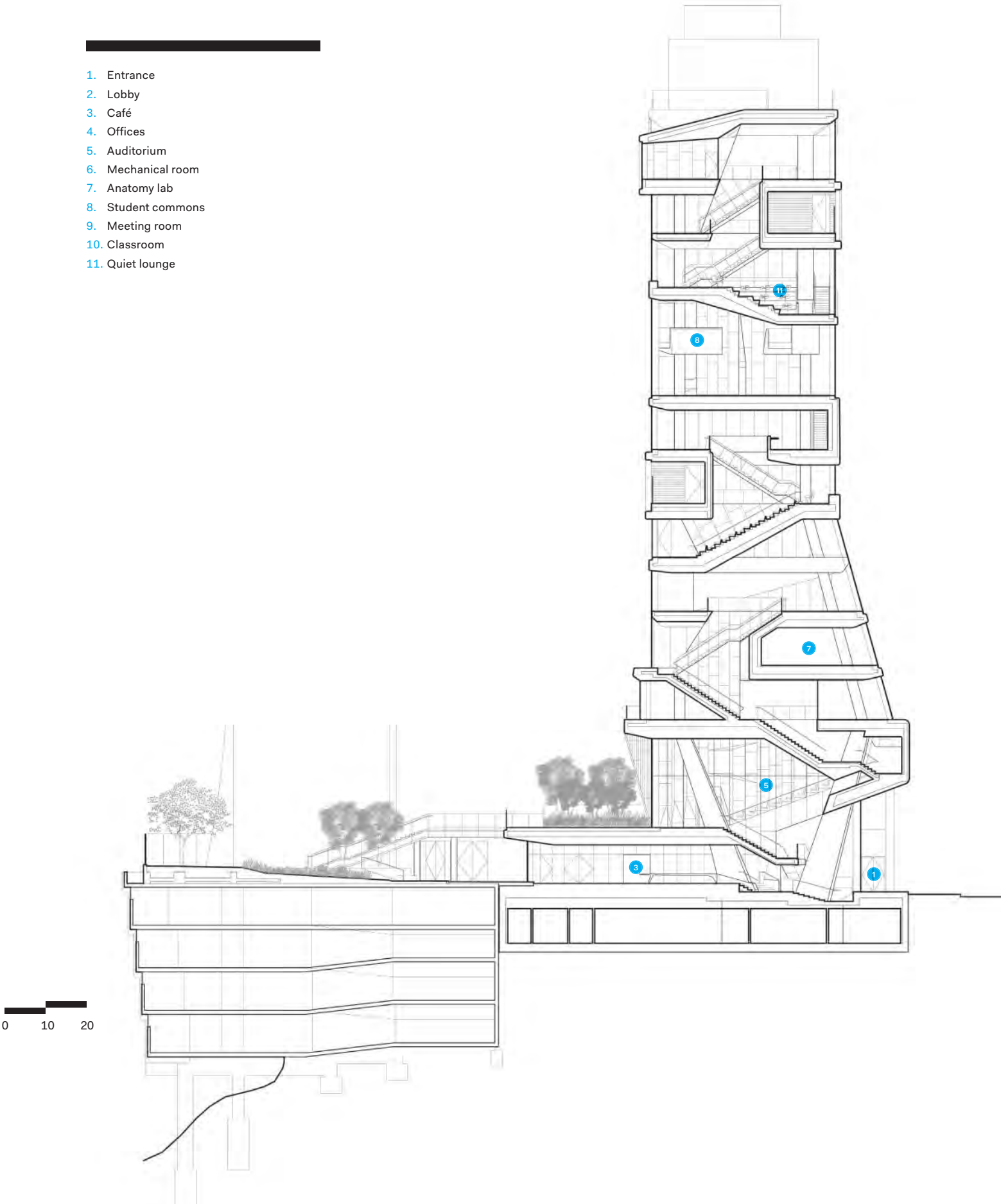
Ground-Floor Plan

Third-Floor Plan



Section A–A₁

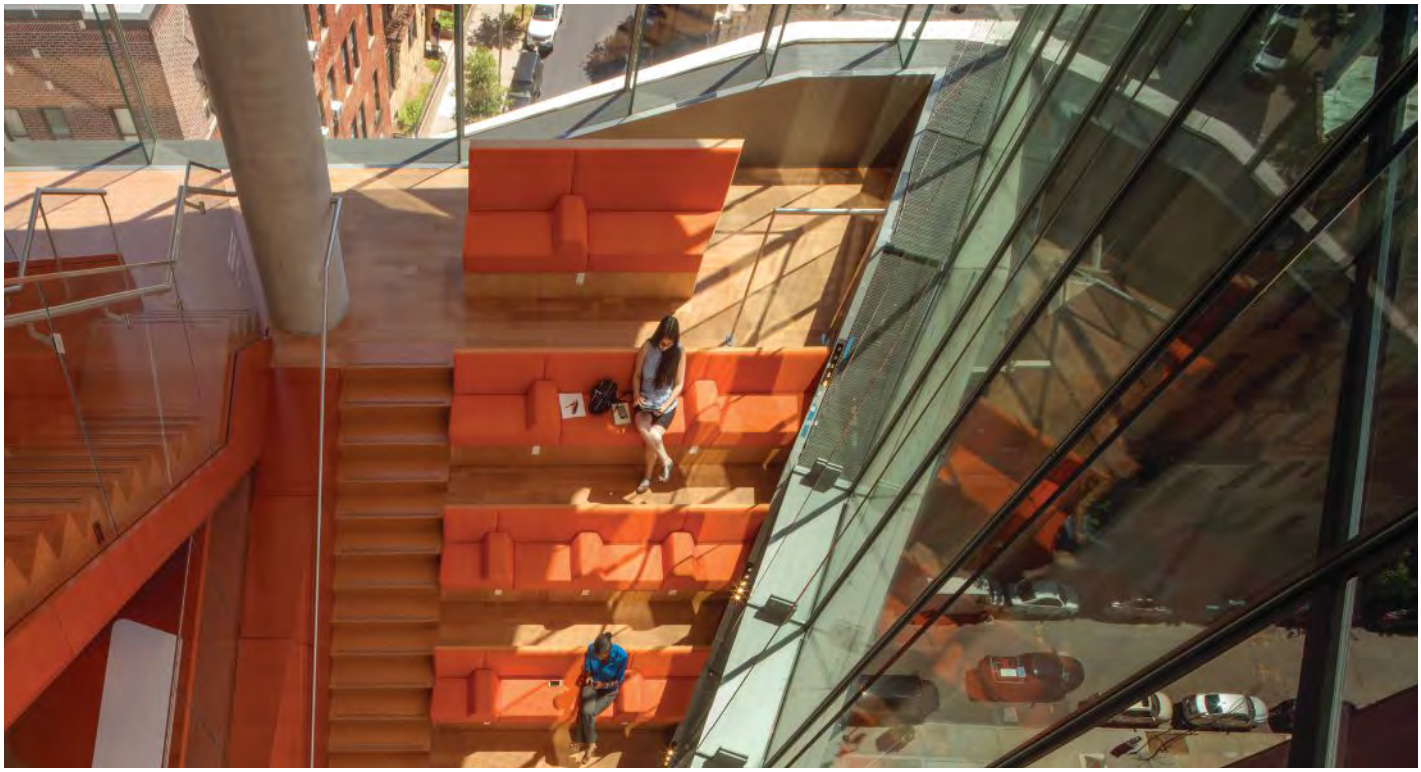
1. Entrance
2. Lobby
3. Café
4. Offices
5. Auditorium
6. Mechanical room
7. Anatomy lab
8. Student commons
9. Meeting room
10. Classroom
11. Quiet lounge



Top: Second-floor auditorium, with view west to Hudson River

Above: Anatomy lab, showing glazing frit for privacy

Opposite: Ground-floor lobby, with view of stairwells

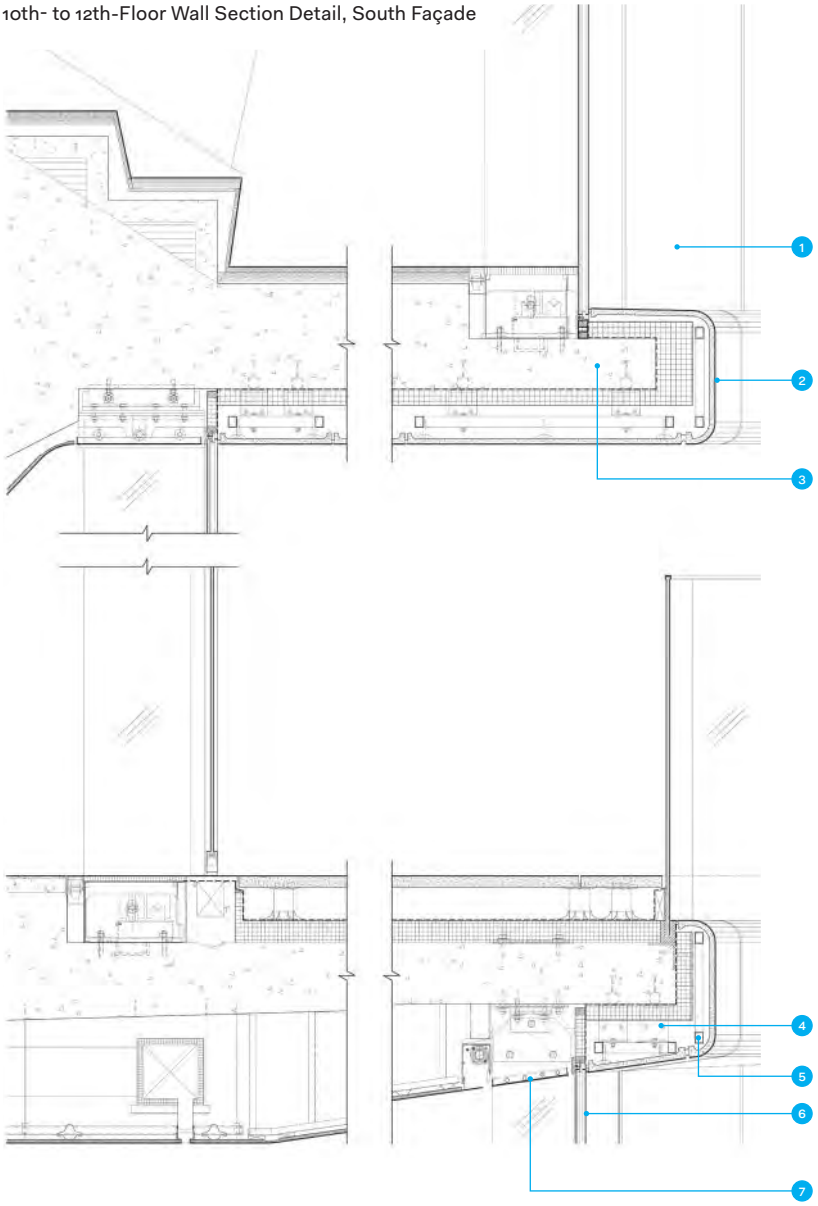


Opposite, Top: Fourteenth floor, with student lounge at right and Sky Room meeting space at left

Opposite, Bottom: Terraced, eighth-floor quiet lounge

This Page: Tenth floor, double-height commons space

10th- to 12th-Floor Wall Section Detail, South Façade



1. Laminated glass fin
2. Glass-fiber reinforced concrete (GFRC) panel
3. Post-tensioned cast-in-place concrete slab
4. Galvanized metal hanging system for GFRC panels
5. Galvanized metal framing for GFRC panels
6. Insulated structurally glazed unit
7. Radiant panel

0 1 2

Project Credits

Project: The Roy and Diana Vagelos Education Center, New York
Client: Columbia University Medical Center
Design Architect: Diller Scofidio + Renfro, New York · Elizabeth Diller (partner-in-charge); Ricardo Scofidio, AIA, Charles Renfro, AIA, Benjamin Gilmartin, AIA (principal designers); Anthony Saby (project director); Chris Hillyard, AIA (project architect); Chris Andreacola, AIA, David Chacon, AIA, Christopher Kupski, AIA, Barak Pliskin, AIA, Kevin Rice, AIA, Gerard Sullivan, AIA, Mary Broaddus, Charles Curran, Robert Donnelly, Amber Foo, Yoon-Young Hur, Joshua Jow, Andreas Kostopoulous, Joseph Dart Messick, Patrick Ngo, Matt Ostrow, Stefano Paiocchi, Jesse Saylor, Jack Solomon, Hallie Terzopolos, Elizabeth Wisecarver (design team)
Executive Architect: Gensler, New York · Madeline Burke-Vigeland, AIA (principal-in-charge); Kristian Gregerson, AIA (project manager); Ambrose Aliaga-Kelly, AIA (technical director); Joanne Fernando, AIA, Jinho Kim, AIA, Michelle Neary, AIA, Bill DuBois, Ana Espejo, Mariano Ortiz, Henry Hong, AIA, Scott Wilson, AIA (design team)
Structural Engineer: Leslie E. Robertson Associates
M/E/P Engineer/Security and I.T. Consultants: Jaros Baum & Bolles
Landscape Architect: SCAPE/Landscape Architecture
Curtainwall Consultants: BuroHappold Engineering
Lighting Consultants: Tillotson Design Associates
Acoustic/Audio/Visual Consultants: Cerami & Associates
Building Code Consultants: Milrose Consultants
Elevator Consultants: Jenkins & Huntington
Graphic Designers: 2x4; Gensler
Civil/Geotechnical Engineers: Thornton Tomasetti
Sustainability Consultants: Vidaris
Food Service Consultants: Cini-Little International
Construction Managers: FJ Sciame Construction
Owner's Representative: Group PMX
Size: 110,000 gross square feet
Cost: Withheld

Opposite: View from south at dusk

Skidmore, Owings & Merrill's 56-story, mixed-use Jiangxi Nanchang Greenland Zifeng Tower adds an essay in geometric rigor to the prosaic skyline of Nanchang, China.

TEXT BY NATE BERG

PHOTOS BY LV HENGHZHONG

When Skidmore, Owings & Merrill (SOM) won the competition to design the first major building for a business district in the southeastern Chinese city of Nanchang, the architects in the firm's Chicago office felt a dual set of responsibilities: As a potential new landmark, the office and hotel tower had to make a statement, but the building—and, by extension, the new district—shouldn't steamroll older parts of the city.

"We wanted to try to make visual, physical, and mental connections with the old city, and to unify that new district," says SOM's Mark Nagis, AIA, senior design architect on the Jiangxi Nanchang Greenland Zifeng Tower. "Instead of turning its back on the old city, it was trying to celebrate it." That sentiment led to the design of the 56-story tower's signature element, a semi-triangular void carved into opposite sides of the tower's top third. The designers call it the "Great Window," and Nagis says it acts as a large aperture "that looks west toward the old city, but also looks east towards the new city, toward the future of Nanchang."

The carving of the Great Window had symbolic results, but was initially inspired by the practical need to slim down the floor plates on the tower's upper levels, which are occupied by a luxury hotel with smaller spatial needs than the offices below. And, as it turned out, the large indentations had other benefits: "We found that carving into it actually created more surface area oriented to the best views," Nagis says.

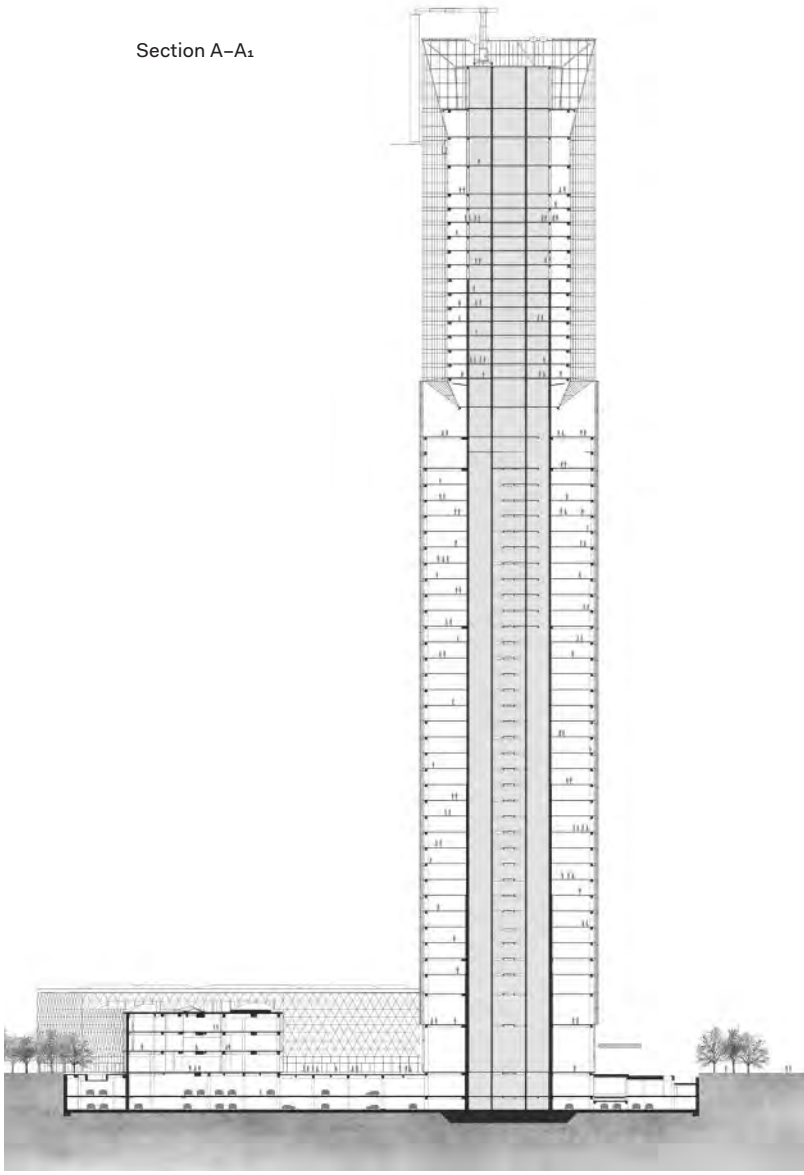
Though the Great Window helps the building stand out, a more subtle design element reveals itself closer up. Wrapping around almost all of the tower is a triangulated grid of aluminum fins, each about 1.5 feet wide and suspended off the building's sheer glass walls. These fins serve as shading structures, and their depth and diagonal orientation help to reduce solar heat gain from the building's east-west exposure as well as the strong sunlight from the south. The nodes that connect the diagonal fins have been embedded with high-intensity LED fixtures that provide the tower's lighting expression. By night, the tower glows in a dot matrix of light.

At ground level, the triangular geometries inform the design of the retail podium that anchors the tower. The podium's roof and the large public plaza outside the building, designed by landscape architect SWA Group, echo the geometry of the fins in a series of triangular segments of turf, skylight, and hardscape.

By connecting the tower to the landscape and thus connecting it to the city, the team answered the pressure of designing a new landmark with a thoughtful attention to detail. "This project was going to kick off that entire new development," Nagis says. "We knew that we wanted to create a large civic gesture."

Previous Spread: View looking north

Section A–A1

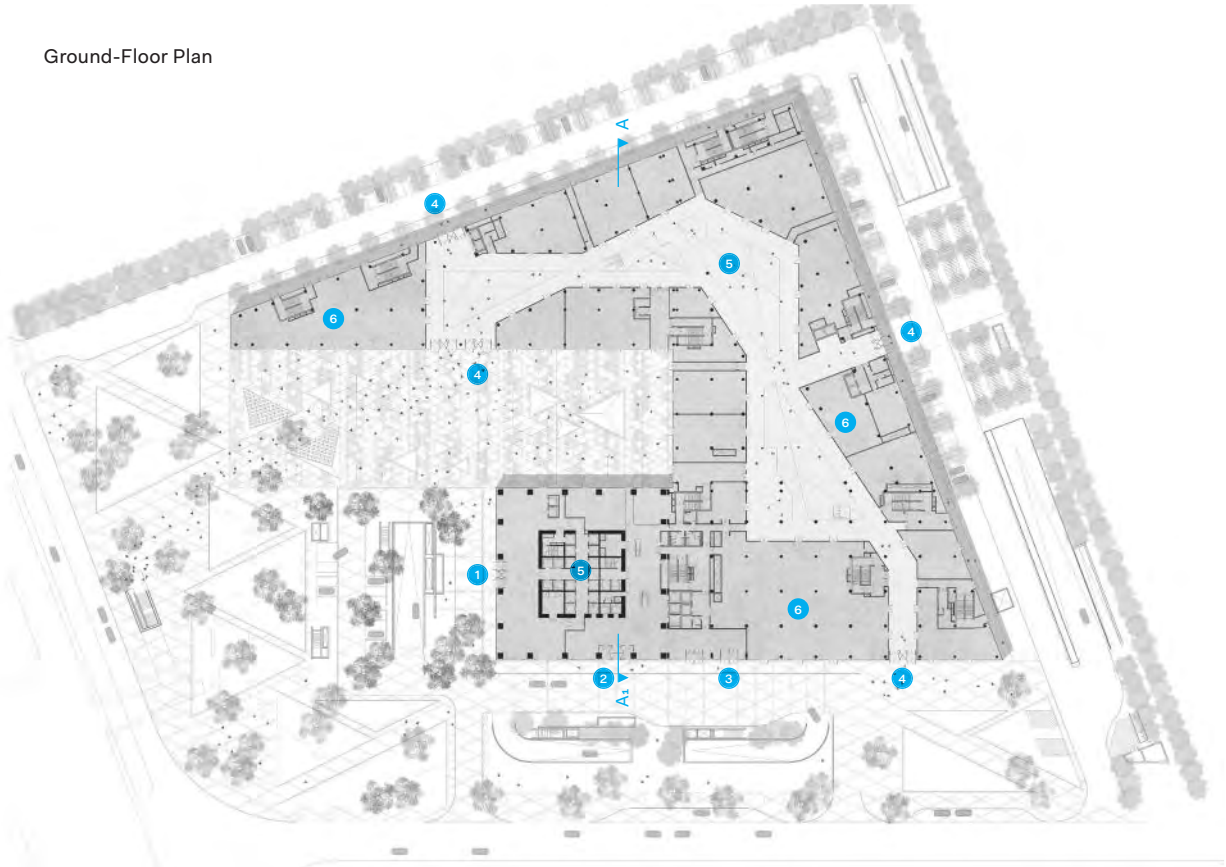


1. Office entrance
2. Hotel entrance
3. Ballroom entrance
4. Retail entrance
5. Circulation
6. Retail
7. Office

0 20 40

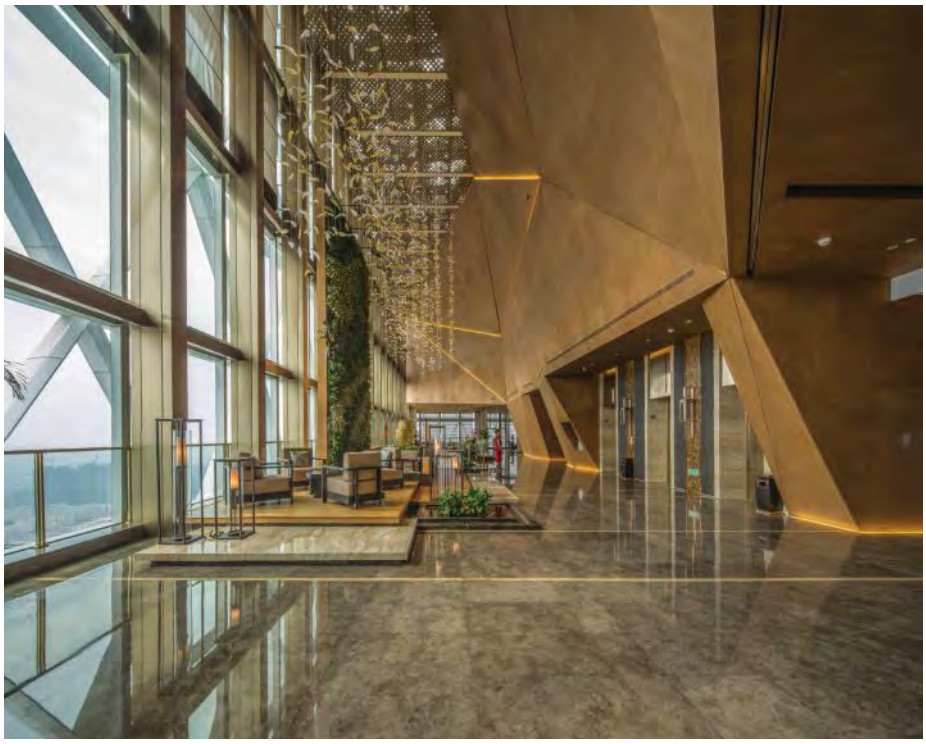
Typical Office-Level Plan

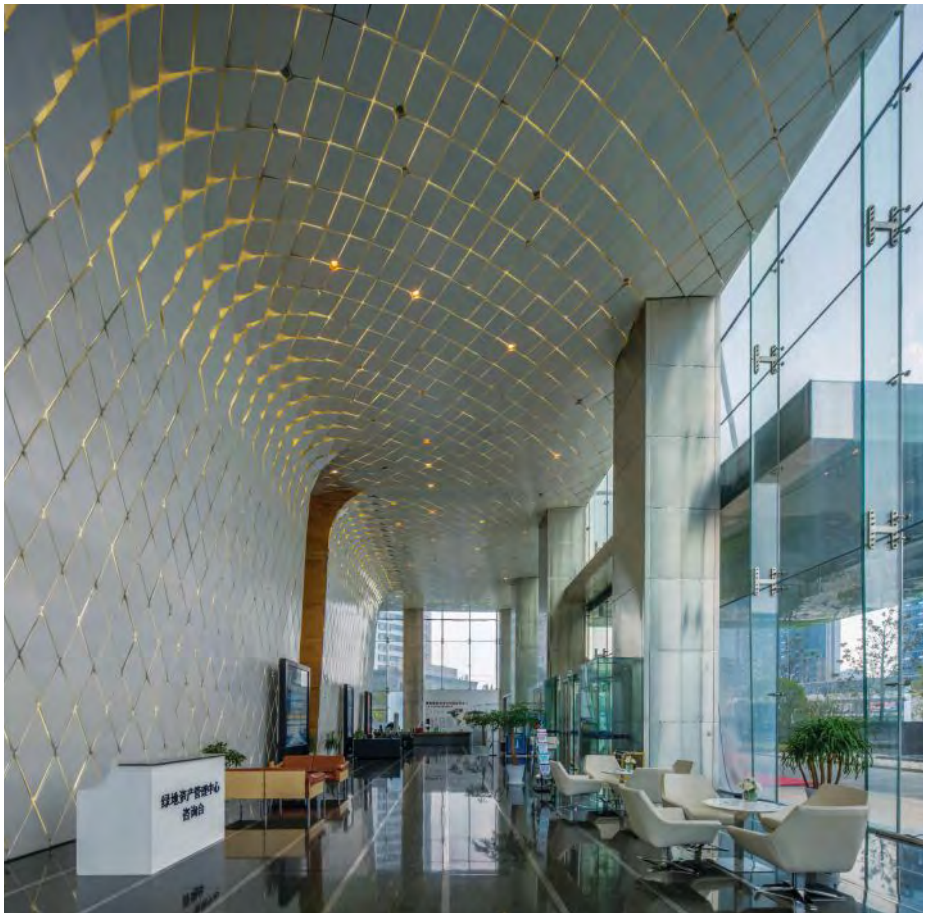
Ground-Floor Plan



East entrance

DAVID LLOYD/SWA





Project Credits

Project: Jiangxi Nanchang Greenland Zifeng Tower, Nanchang, China
Client: Greenland Group Nanchang
Design Architect: Skidmore, Owings & Merrill, Chicago · Jeffrey McCarthy, FAIA (managing director); Ross Wimer, FAIA (former design director); Luke Leung (M/E/P director); William Baker (structural partner/director); Michael Pfeffer, AIA (project manager); Mark Nagis, AIA (senior design architect); Gregory Smith, AIA, Yue Zhu, AIA (senior technical coordinators); Henry Chan, AIA (technical coordinator)
Landscape Architect: SWA Group
Lighting Design: Kaplan Gehring McCarroll Architectural Lighting
Fire Protection Engineering: Jensen Huges (formerly Rolf Jensen & Associates)
Vertical Transportation: Edgett Williams Consulting Group
Façade Access: Lerch Bates
Acoustic Engineering: Shen Milsom & Wilke
Wind Engineering: Rowan Williams Davies & Irwin
Size: 209,058 square meters (2.25 million square feet)
Cost: Withheld

Above: Hotel lobby

Left: Ground-floor lobby

Opposite: East façade


HUALUXE
NANCHANG

Ateliers Jean Nouvel tempers the Mediterranean heat with the hanging gardens of its **White Walls** mixed-use tower in **Nicosia, Cyprus.**

TEXT BY EDWARD KEEGAN, AIA
PHOTOS BY YIORGIS YEROLYMBOS

For Pritzker Prize–winning architect Jean Nouvel, HON. FAIA, there's neither a typical nor an ordinary project. From the luminous double-walled, glass-and-concrete Torre Agbar in Barcelona to the subtly battered Hôtel de Police in Charleroi, Belgium, he has consistently brought surprising formal inventions to the high-rise genre. Paris-based Ateliers Jean Nouvel's latest exploration in the type is no less memorable: White Walls is a 220-foot-tall, white-painted concrete structure in Nicosia, Cyprus. The 107,639-square-foot trapezoidal tower, which includes two floors of retail, six floors of offices, and 10 floors of apartments, cuts a memorable figure on the skyline with pixelated cut-outs on the east and west façades (above) that offer glimpses of gardens within.

Penthouse Loft Plan

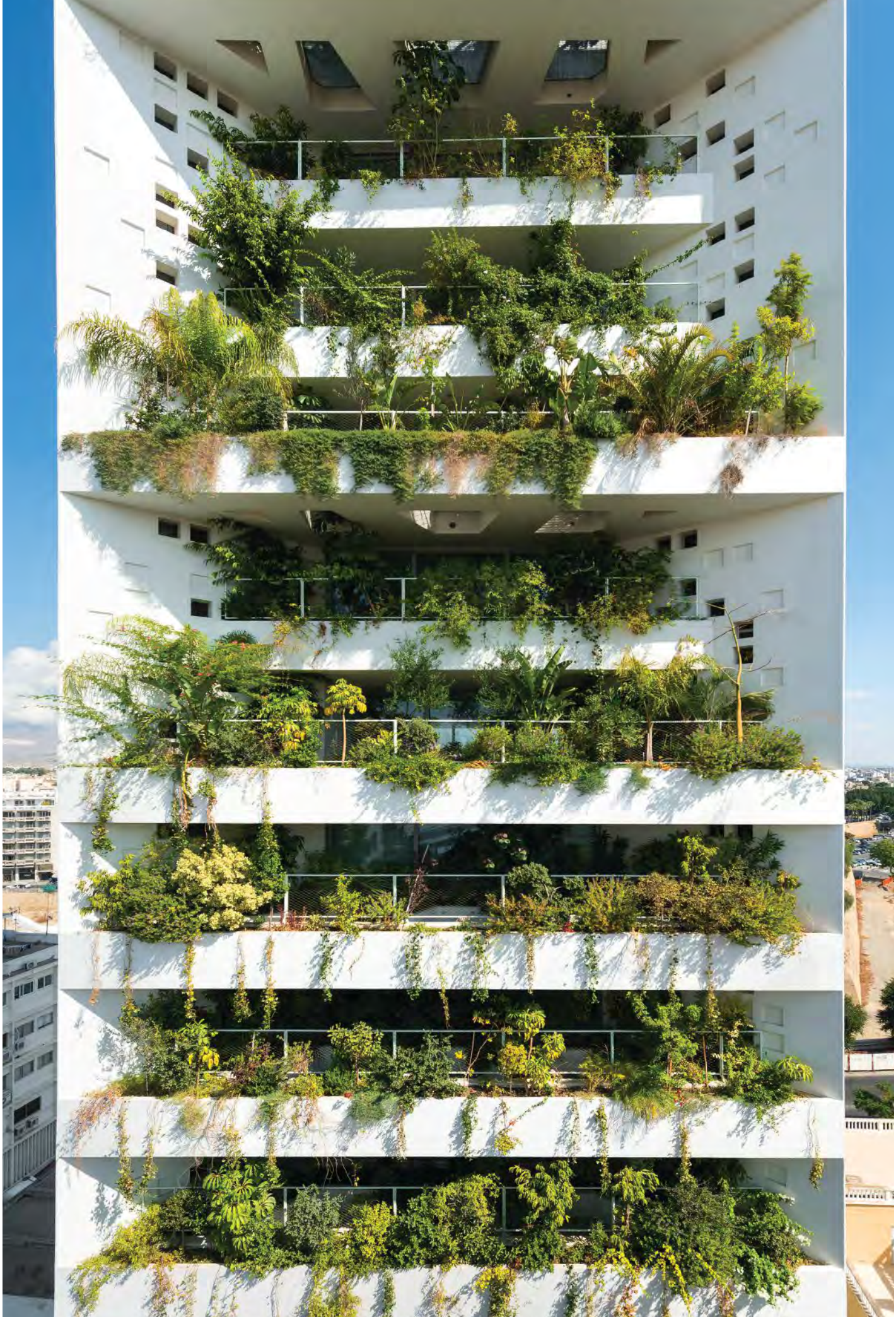
Typical Residential Floor Plan

Typical Office Floor Plan

Ground-Floor Plan

Section A–A₁

1. Residential entrance
2. Office entrance
3. Lobby
4. Garden
5. Meeting room
6. Kitchen
7. Office
8. Bedroom
9. Living room



The structure's south façade (opposite) is angular and hard-edged, in contrast to the softer, rounded balconies, rendered in white-painted concrete, of the north façade (opening spread). Vegetation bursts from each balcony, covering roughly 80 percent of the south face and providing substantial shade during the summer while still allowing sun to penetrate to the interior during winter months. Nouvel subverts the standard structural logic of the tall building by constructing concrete piers at the east and west ends—which contain standard core elements such as stairs and elevator, and more private programmatic functions such as meeting rooms and bedrooms. These piers are joined by column-free spans that serve as open offices in the lower floors and open-plan living areas in the residences above. The architect plays with the nature of a concrete wall though the varied perforations (above), which make the vertical surface appear in some instances to be a simple screen, at other times a protective shell. The larger openings are filled with verdant gardens that overflow their containers and sprout lush green foliage from the building's envelope.

Project Credits
Project: White Walls (Tower 25), Nicosia, Cyprus
Client: Nice Day Developments
Design Architect: Ateliers Jean Nouvel, Paris · Jean Nouvel, HON. FAIA (founder); Emmanuel Blamont (adviser to Jean Nouvel); Philippe Papy, Elisabeth Kather (project leaders); Sony Devabhaktuni, Nobuo Yoshida (architects)
Local Collaborating Architect: Takis Sophocleous Architects, Nicosia · Anastasia Koumoulidou, Demetris Sophocleous
Structural Engineer: KAL Engineering
M/E/P/FP Engineer: Mitsides Samouhl & Partners
Quantity Surveyor: Nicolaou & Konnides
Size: 10,000 square meters (107,639 square feet)
Cost: €11.5 million ($12.9 million)

Both apartments and offices feature substantial outdoor loggias (opposite) that allow all building occupants to enjoy Nicosia's temperate climate. Voids and windows in the concrete walls are designed to a module of 0.4 meters—almost 16 inches—square. This dimension gave the architects freedom to pattern the building's east and west façades with various scales of these apertures, making it nearly impossible to differentiate between single- and double-height spaces from outside. The perforations blur—in ever so digital a manner—any meaningful sense of scale among the building's 18 floors. The balconies to the north and south ensure that every room, even the apartment kitchens (above), has an outdoor connection. A duplex apartment (top) caps the tower; its central courtyard layout is based on Cyprus' traditional architecture, with sloped louvers providing shade while retaining views to the sky. In Nicosia, Nouvel integrates tower and landscape while employing the white walls of the island's vernacular, rendered larger, and in formally inventive and surprising ways.

In an unprecedented collaboration, Legorreta + Legorreta and Rogers Stirk Harbour + Partners wed their signature design approaches in the BBVA Bancomer Tower in Mexico City.

TEXT BY THOMAS DE MONCHAUX

PHOTOS BY ROLAND HALBE


BBV

Does it sound like faint praise to say that the greatest skyscraper of 1970 has just been built where the Paseo de la Reforma meets Chapultepec Park in Mexico City? It shouldn't. The remarkable rigor and restraint of the 50-story, 848,196-square-foot BBVA Bancomer Tower—an unusual collaboration between two established firms, London-based Rogers Stirk Harbour + Partners (RSH+P) and Mexico City–based Legorreta + Legorreta—serves as a tart corrective to the rendering-driven formalism and gratuitous gimmickry that passes for big thinking in today's ever-more-dense, ever-more-tall, ever-more-populous cities.

The look of this new headquarters building for Mexico's largest financial institution isn't a result of any self-conscious historicism, but is instead a "so-new-it's-old" or "so-old-it's-new" throwback to a peak moment, about a half-century ago. That's when the global profession of architecture had (with the not-incidental influence of Richard Rogers, HON. FAIA, and his High-Tech peers) fully assimilated the robust formal lessons—and conceptual ambitions—of the Brutalists, Metabolists, and other late-midcentury moderns, but had yet to bury the associated engineering breakthroughs inside the pseudo-Neoclassical or expressionist stylistic detours that followed. Instead, as RSH+P project architect and associate partner James Leathem says with a prosaically inadvertent poetry typical of this new building itself: "It is what it is and that's all there is to it."

What it is, visibly, is a building of components and extrusions. Engineered for earthquakes, the structure is distributed between a perimeter steel-truss system that features stacked and slab-strained inverted-V-shaped "megaframes" with brace nodes that, toward the building's top, can oscillate some 5 feet to release seismic load. Several ferroconcrete service and elevator cores cross the tower's square plan along a 45-degree traverse. At the double-height, double-width 12th-floor "sky-lobby"—which extends atop an adjacent parking structure and features a cafeteria and auditorium, along with the primary security bottleneck—joints and junctions are designed to be able to move a few feet in any direction if the earth shakes, with surfaces overlapped to laterally shift, as Leathem says, "like a gangplank on a ship's deck."

The sky-lobby is reached by glass-walled outboard elevators that daintily recall their more dramatic antecedents on Rogers' 1986 Lloyds of London office tower, here arrayed along the tower's chamfered corner facing Reforma. In a bustle-like annex, the necessary helical curves of the car ramps up those same 12 levels at the base add a rounded sculptural element—a timelessly modern maneuver of exploiting functional necessities for formal fun, here enhanced by a vaguely Corbusian roofscape decked out in apricot orange.

The chevron pattern of the perimeter megaframes is elaborated by what the designers, in a nod to vernacular sunshade precedents, call *celosias*: steel diagrid lattices of mulberry-tinted shading blades, which in turn support aluminum screens that are calibrated to allow uninterrupted views for those seated at desks inside, while filtering out glare and heat gain from all that 24-degree-north-latitude daylight (and contributing to the project's LEED Gold rating). The megaframes also meant, Leathem says, that "we could scoop out outdoor sky terraces behind the structure, bringing the feeling of the park up into the building."

The five triple-height excisions, trapezoidal in plan, span the tower's full width, and serve, in theory, as informal social condensers for associated "neighborhoods" of corporate divisions. Harry Bertoia patio chairs and George Nelson tables add a touch of California ease. Those administrative neighborhoods are expressed somewhat more insistently in six boxy extrusions at the tower's park-facing corner, each containing conference rooms with panoramic views. The striking colors—yellow, blue, red, orange—with which the sky gardens are lined, "are not whimsical," Leathem says: at the urban scale, they break up the tower's volume, and at the human scale, extending to interior furnishings and wayfinding, they contribute to a sense of place within the larger complex.

The colorful sky gardens recall Rogers' 2005 design for Madrid's Barajas International Airport, with its rainbow-hued spectrum of structural steel felicitously color-coding its gates. But they also strongly evoke—along with the building's primal mediation between the orthogonal and the oblique, the massive and the perforated, and the volumetric and the planar—the enduring interests of the late Ricardo Legoretta, once a protégé of the original modernist colorist, Luis Barragán.

It's a surprising convergence between the legacies of the earthy Ricardo and the steely Richard. "We were slightly concerned about how the collaboration might work out at the start, coming from different design cultures and backgrounds," Leathem concedes. But eventually, "it worked well. One of the things that made it work was the megaframe, which was a clear organizing idea. Once we all got to that framework, we could plug pieces into the system. So we'd build on that."

The High-Tech cohort has had mixed fortunes since its height in the last decades of the last century: Foster + Partners' latent classicism has become increasingly explicit; Renzo Piano Building Workshop's failures at New York City's Whitney Museum and Fort Worth's

Section A–A₁

Kimbell Art Museum cast a shadow on its late work; London-based practices Hopkins Architects and Grimshaw Architects have each developed deeper, yet sometimes narrower, practices. But the BBVA Bancomer tower in Mexico City suggests that some old dogs may yet have new tricks.

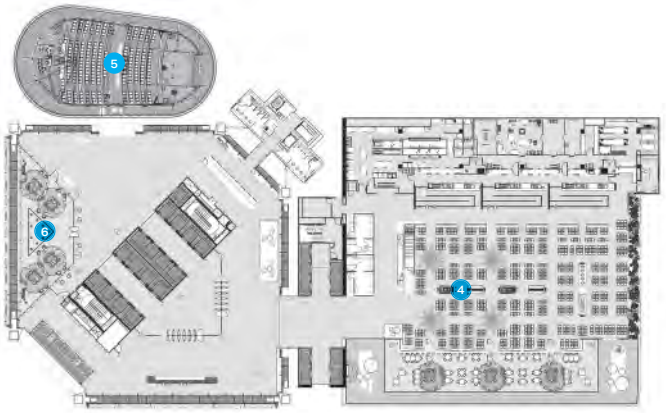
The success of the "LegoRogers" collaboration makes a case for fewer brand-burnishing signature moves and for more collective intelligence. Despite the fact that these days, an office tower for a big bank is not an especially soul-stirring venture, there may be something critical, even gently radical, in the building's candid curiosity about the relationship of function to form, material to structure, landmark to landscape, environment to event.

"We weren't trying to make it look like anything, not even like something from NASA," Leathem says, acknowledging the Space Age vehicles that have surely, since Rogers' own Zip-Up House proposal of 1967, inspired the firm's aesthetic. "Everything serves a purpose." The result is a building with an expressed economy of means—a good look for a bank—that is austere without being severe. Poignantly, and almost polemically, its tallest point is an extrusion of its humblest service core: a concrete tube at the back corner that accommodates an express elevator and plumbing pods, extruded further up for access to a rooftop helipad. "On the original scheme we had some spires," Leathem says. But, fittingly, "we took them off, because they didn't do anything."

Previous Spread: View from north

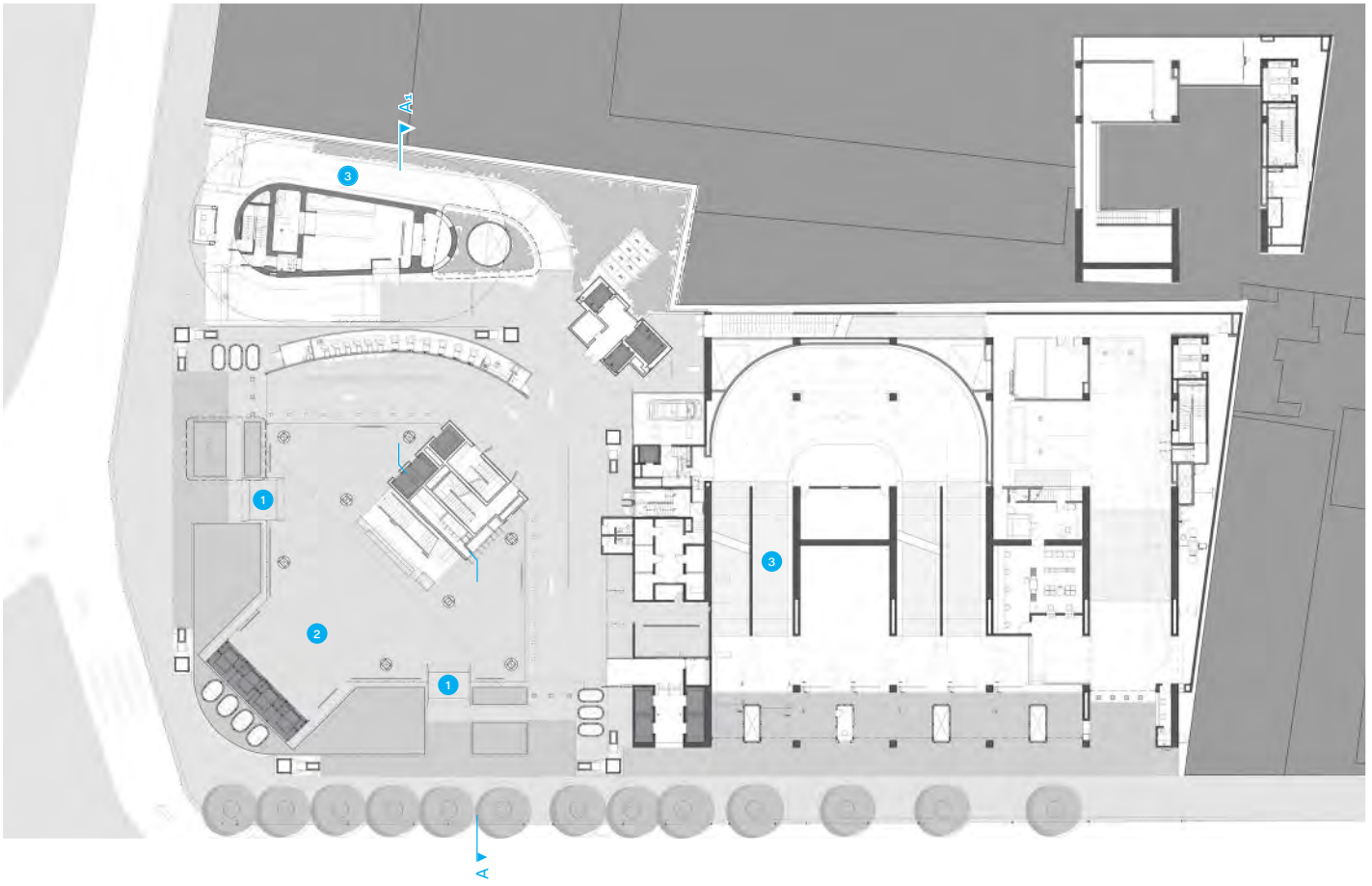
Main entrance, with spiral parking ramp at left

Sky-Lobby-Level Plan



Typical Office Floor Plan

Ground-Floor Plan



1. Entrance
2. Lobby
3. Parking
4. Café
5. Auditorium
6. Sky terrace
7. Office
8. Conference room

0 40 80 N

Opposite: Sky-lobby-level café

Above: Sky terrace

Opposite: View from west, showing conference room pods

Project Credits

Project: BBVA Bancomer, Mexico City
Client: BBVA Bancomer
Architect: LegoRogers (a collaboration between Legorreta + Legorreta, Mexico City, and Rogers Stirk Harbour + Partners, London)
Interior Design: LegoRogers; Skidmore Owings & Merril
Landscape Design: Espacios Verdes
Structural Engineer: Arup; Colinas de Buen
Public Health Installations: Garza Maldonado y Asociados
Air Conditioning/Thermal Analysis Façade Consultant: DYPRO
Security/Smoke Detection: Logen
Acoustics/Multimedia: Saad Acústica
Signage: Rommy Serrano
Parking Consultant: Walker Parking Consultants
Geotechnical Engineer: Ingeniería Experimental
Heliport Consultant: ATG Airports
Traffic Impact Consultant: ITT
Planning and Environmental Consultant: Asesoría Urbana
Catering Consultant: Grupo Lux
LEED Consultant: HKS
Fire/Transportation Consultant: Arup
Electrical Consultant: DEC
Wind Tunnel Study: RWDI Consulting Engineers & Scientists
Consultant Codes and Regulations: Luis Rosales
Renders: DECC
Size: 188,777 square meters (2.03 million square feet); 78,800 square meters (848,196 square feet) (office)
Cost: Withheld

Arata Isozaki and **Andrea Maffei** devise a brilliantly straightforward structural solution for the ultrathin profile of the **Allianz Tower at CityLife** in **Milan**.

TEXT BY CLAY RISEN

PHOTOS BY ALESSANDRA CHEMOLLO


Allianz
ROLLS ROYCE
RENAULT
UN GRANDE FUTURO PASSA DI QUI

Milan has long been the financial capital of Italy, but until recently, it has lacked the dense verticality that marks other European economic powerhouses like Frankfurt in Germany and Paris's La Défense. In the last few years, though, skyscrapers have started springing up around the city center, mostly to provide office space for companies like Google and LinkedIn.

One of the most watched of this new crop of tower developments has been CityLife. Located a few miles northwest of central Milan on the site of the old city fairgrounds, the complex is anchored by three towers, including one by Zaha Hadid and one by Daniel Libeskind, AIA. The third is the 50-floor Allianz Tower, which, at 793.3 feet tall at the tip of its broadcast antenna, is now the tallest building in Italy.

Designed by Tokyo's Arata Isozaki, HON. FAIA, and Milan's Andrea Maffei and nicknamed "Il Dritto," or "The Straight One," the Allianz Tower strikes a stunning profile: An impossibly thin 79 feet deep by 202 feet long, it is composed of eight six-floor sections, with the glass in each seeming to billow out like a pillow. The curtainwall's cold-bended, triple-glass-unit panels are affixed to a steel frame that is curved to the outside, but straight against the interior façade.

From the side, the tower intentionally resembles Constantin Brancusi's *Endless Column*, Maffei says. "Our projects always start with a concept that we want to tell with architecture. In this case the concept was the idea of infinity." Isozaki and Maffei placed the elevators and core functions at either end of the building, so "the skyscraper becomes a thin transparent sheet that light passes through," Maffei says.

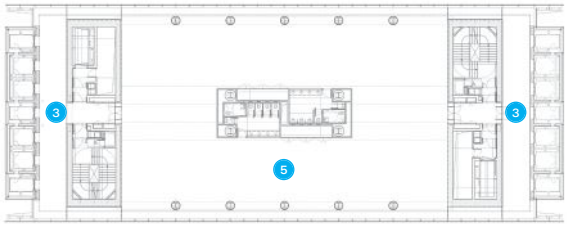
To keep the building rigid, construction crews sank 62 concrete columns 101 feet into the ground below the reinforced-concrete foundation. At the 24th floor, the two cores, also made of reinforced concrete, are connected by a steel belt truss. According to Maffei, the building is strong enough to withstand a seismic event, with some movement on the upper floors. Rather than sacrifice office space at the top for a damper, the team opted for four external, and gold-painted, steel buttresses, which anchor into the structure at the 11th floor. The two on the building's northwest side are 196 feet long and connect to a brace in the basement; the two to the southeast are 131 feet long and anchor into a pair of support structures that house meeting rooms and cooling towers.

The Allianz Tower's thinness is not just to show off the team's engineering prowess. Relegating core functions to the ends allows for versatile interiors. "Our idea was to create a very flexible office space," Maffei says. "The way of working is changing quickly and office space needs to follow this transformation."

Previous Spread: View from east

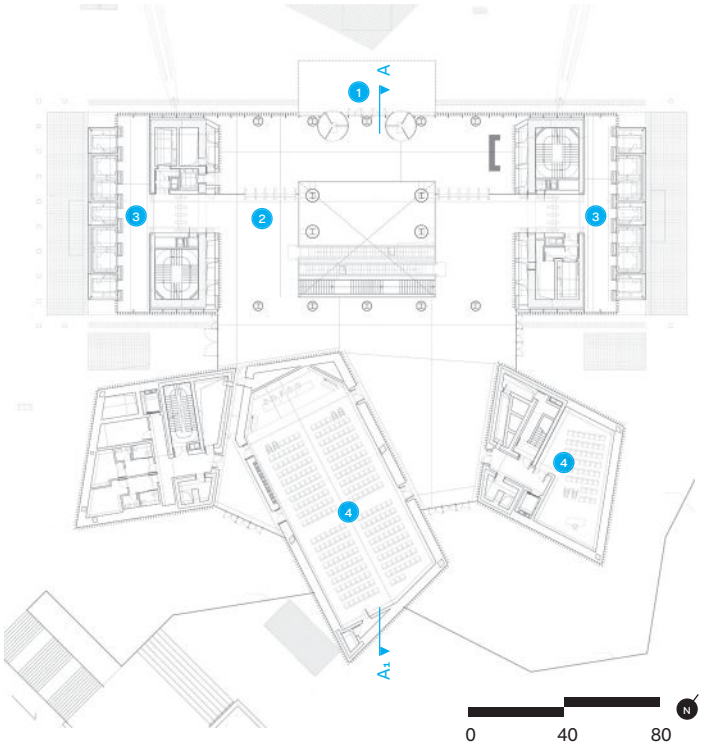
Below: View of thin profile from southwest

Typical Office-Floor Plan



Section A–A₁

Ground-Floor Plan



1. Entrance
2. Lobby
3. Circulation core
4. Meeting room
5. Office

Opposite: View of curved curtainwall panels and gold-painted structural-brace connection at 11th floor

Above: View of tower base from south, showing pavilions containing meeting rooms and cooling towers

Above and Opposite: Tower lobby

Project Credits

Project: Allianz Tower, Milan
Client: CityLife
Design Architect: Arata Isozaki & Associates, Tokyo, and Andrea Maffei Architects, Milan · Arata Isozaki, HON. FAIA, Andrea Maffei (principals); Pietro Bertozzi, Takeshi Miura, Alessandra De Stefani, Chiara Zandri, Davide Cazzaniga, Vincenzo Carapellese, Roberto Balduzzi, Francesca Chezzi, Takatoshi Oki, Stefano Bergagna, Paolo Evolvi, Elisabetta Borgiotti, Giuliano Godoli, Giorgio Ramponi, Adolfo Berardozzi, Hidenari Arai, Higaki Seisuke, Takuichiro Yamamoto, Carlotta Maranesi, Atsuko Suzuki, Sofia Bedynski, Antonietta Bavaro, Mauro Mazzali, Sofia Cattinari, Taro Hayashi, Haruna Watanabe, Madoka Tomita, Ayako Fujisawa (project team)
Structural Engineer: Sasaki Associates (competition); Arup (project); Holzner & Bertagnolli Engineering, Cap Engineering (basement structures)
Façade Consultant: Arup
Fire Safety: Studio Mistretta & Co.
Vertical Transport: Jappsen Ingenieure
Lighting Design: LPA
Project Management: J&A; Ramboll
General Contractors: Colombo Costruzioni; Focchi
Construction Manager: In.Pro
Size: 81,615 square meters (878,497 square feet) above grade; 44,485 square meters (478,832 square feet) below grade
Cost: Withheld

Tom Kundig of Olson Kundig designs his first high-rise, for fashion importer Shinsegae International in Seoul, South Korea.

INTERVIEW BY KATIE GERFEN
PHOTOS BY KYUNGSUB SHIN

KEVIN SCOTT

How did you get this, your first tower commission?
Tom Kundig, FAIA: We had worked for these clients on a number of projects in Korea—some residential and art spaces. One of the members of the family—which develops stores for the fashion industry—was interested in building this tower and asked if would I would design it. I didn't have a portfolio of tower projects. But the owner was willing to take a risk, and I'm indebted to them for inviting me to work on it.

What was the brief and how did you approach design?
The idea was to collect a number of disparate offices that the family had assembled in different buildings in this neighborhood in Seoul into a single building called Shinsegae International. As for the design, what really drives me is context. I always say that architecture is the exterior context pushing against the interior context. It's the membrane between those two; the push and pull between the two different agendas.

Traditionally, this area has had five- and six-story buildings, because that was the limit of technology when they were built. But in an urban context, people only really take in the first six to seven stories of a building whether you're driving fast in a car or if you're walking. What was really clear is that for the client, the base of this building had to be interesting not only to the people in their cars, but also to the people inside the building. They understood the value of city-scaled architecture that would engage people whether they saw it once or every day over a career.

I think this building responds to the existing built environment at the base. And then in the body of the building, we were making a single place for these people that work together. The top is very much about the community of the building itself, because that's where everybody gets together—in the rooftop garden.

Context and regionalism have always been key in your work? How did you approach that at this new scale?
Architects are professional voyeurs. We look at what is happening now in our cultural context, what happened in the past, and what might happen in the future—that's the context. You spend time thinking about the forces pushing on this building and the reasons that the built environment around it exists as it does. But conceptually, aside from scale and some technology issues, in a way, there's nothing different about approaching the design for a cabin in the high desert or a tower in one of the largest cities in the world.

You're known for a thoughtful approach to materiality. How did you showcase the palette for this project?
We used an aluminum curtainwall system that has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동덕여자대학교
Dongduk Women's Univ.
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some steel elements in it. It builds strength for the windows but it's also a brise-soleil because Seoul is a harsh climate and it affects the efficiency of solar gain and heat loss. And then there's the base, where the materiality really makes itself felt front and center. There's wood on the inside as you enter the building, so it's very warm to the touch, and there's tough steel on the exterior. It's hard on the outside, soft on the inside, like a Tootsie Pop. And, of course, the base is where the gizmos are.

Let's talk about these gizmos—the wheels and panels on the façade. What are they and what do they do?
The gizmos are motor-driven, and the wheels support the motors as they move these black-framed, black-mesh panels up and down along a steel track. It's all computer-controlled so you can change the program—they can move slowly or quickly. They're intended to move like fabric does—changing positions and proportions, and that's important because they're at the city level of visual engagement with the building. The clients can put things on each panel so that you could have a billboard that breaks up or comes together: It's ready to have artists engage. But the gizmos are also in the client's control, and I think it's cool that it engages the building at a human level and gives people the ability to affect this building in a very personal way if they want to.

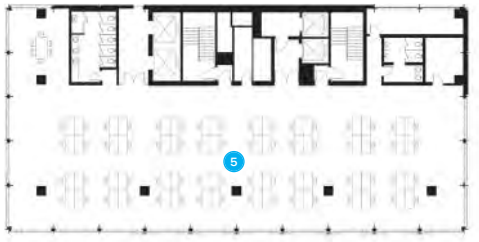
The aesthetic overall is a departure from the purely glazed towers that we see elsewhere. Was that a driving factor in the design?
It was intentional on my part to reconsider how these tall buildings in cities are articulated. With the smaller stuff that I work on, articulation and human touch are really important, and I always think it's somewhat disappointing that taller buildings don't have that. This is a very simple building, done to the envelope that was allowed. I thought the proportions were beautiful, and maybe the subtlety and nuance will be appreciated in the next 50 or 100 years, rather than if it was a one-liner in a crazy shape.

Now that you've got one in your portfolio, can we expect more towers from you? More larger projects?
I'm interested in the adventure of life, where you can go out and experience different places. That's why I like small projects as much as large ones—they take you all over the world. The large projects are interesting from a community-design perspective, and we're getting good as a firm at understanding what the larger community, and the owner, is looking for. It's not about being big or small. It's about: What's the new adventure?

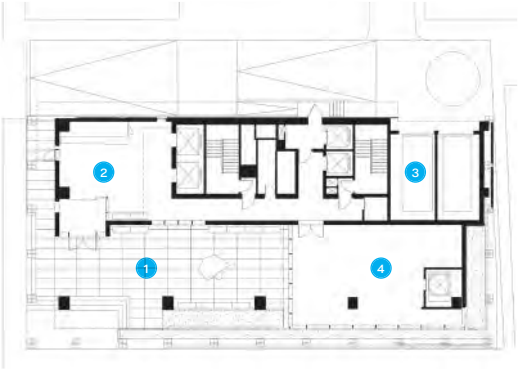
Roof-Level Plan

Amphitheater-Level Plan

Fifth-Floor Plan



Ground-Floor Plan



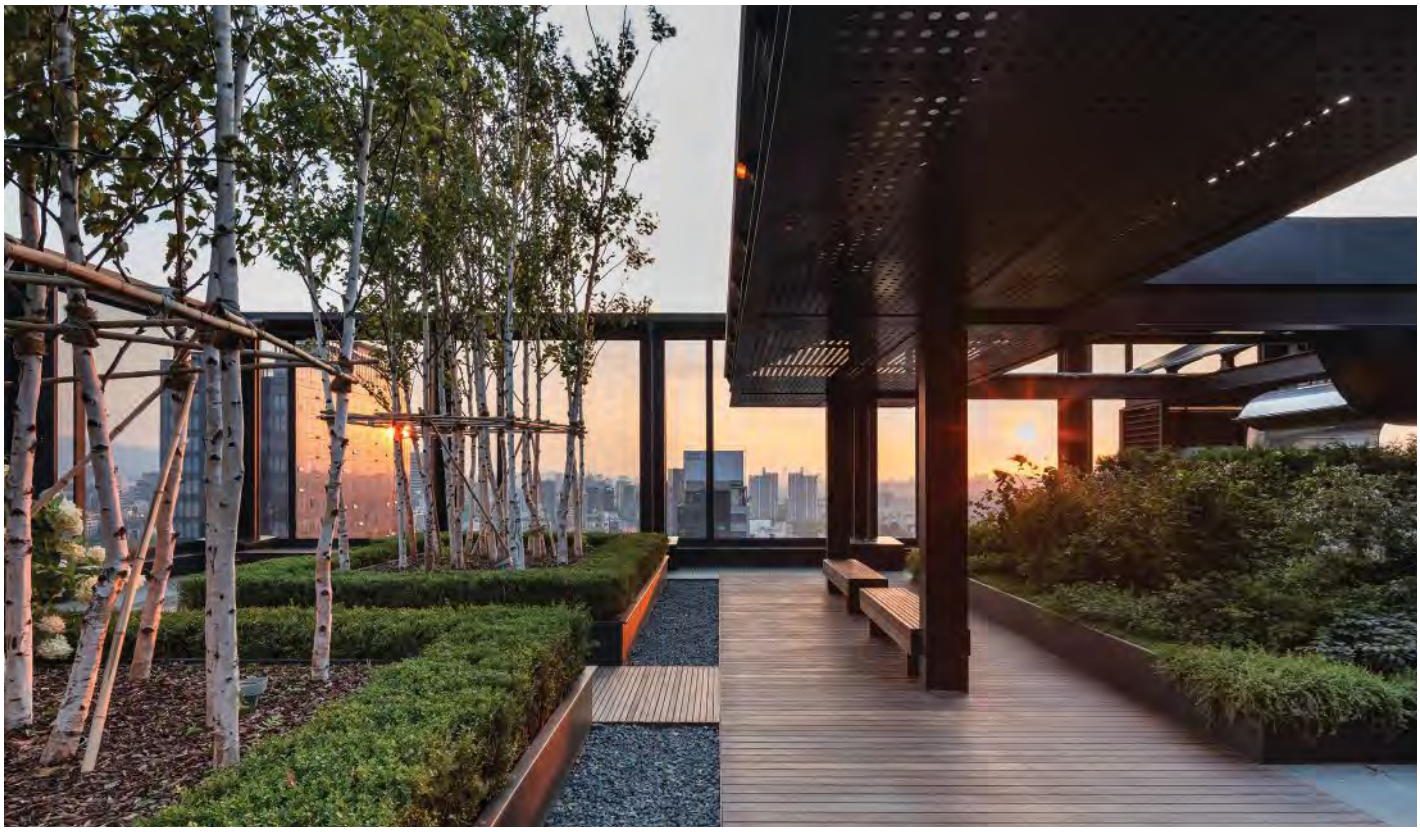
1. Plaza
2. Lobby
3. Auto lift
4. Retail
5. Office
6. Amphitheater
7. Conference room
8. Terrace

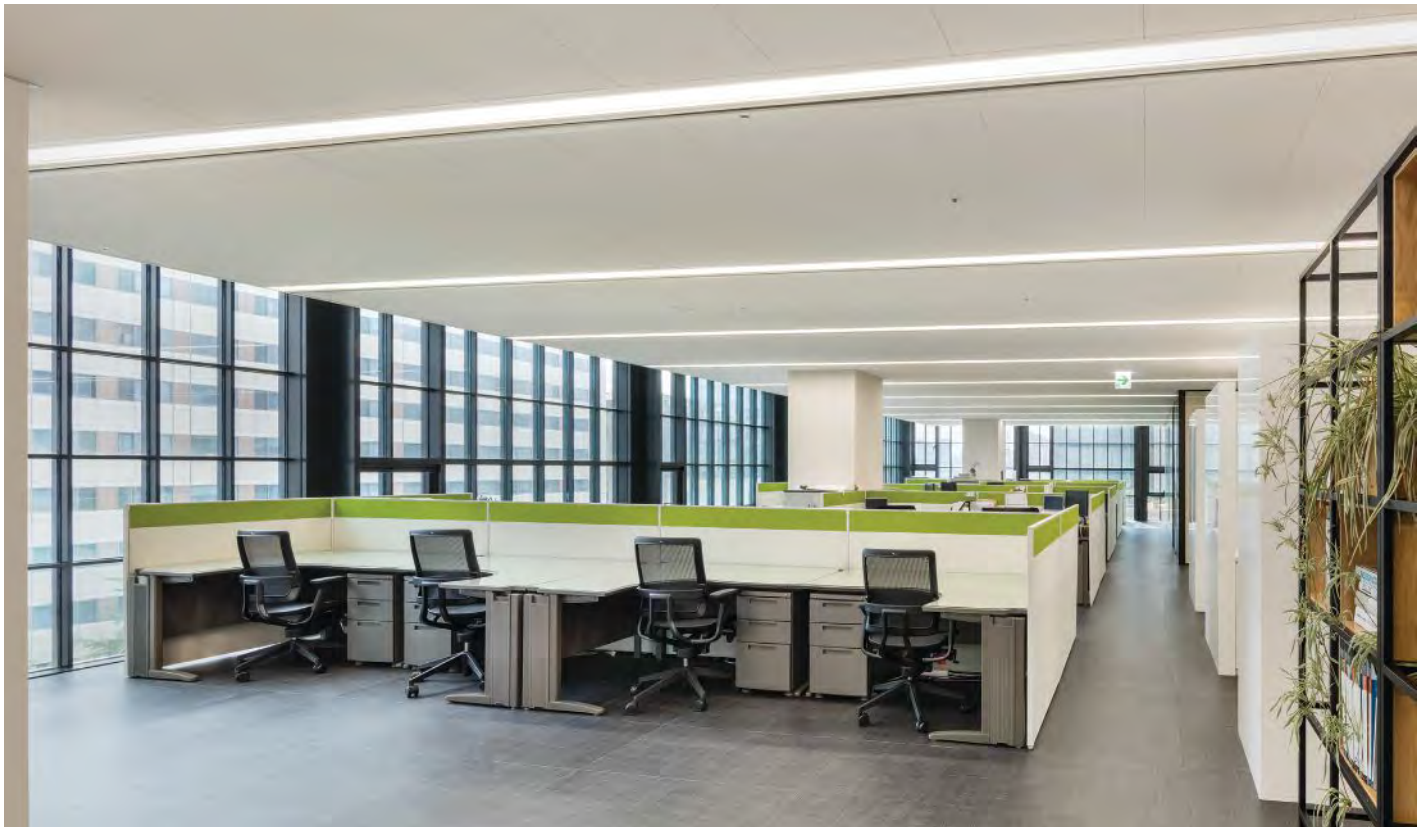
Main entry, with view of screen apparatus

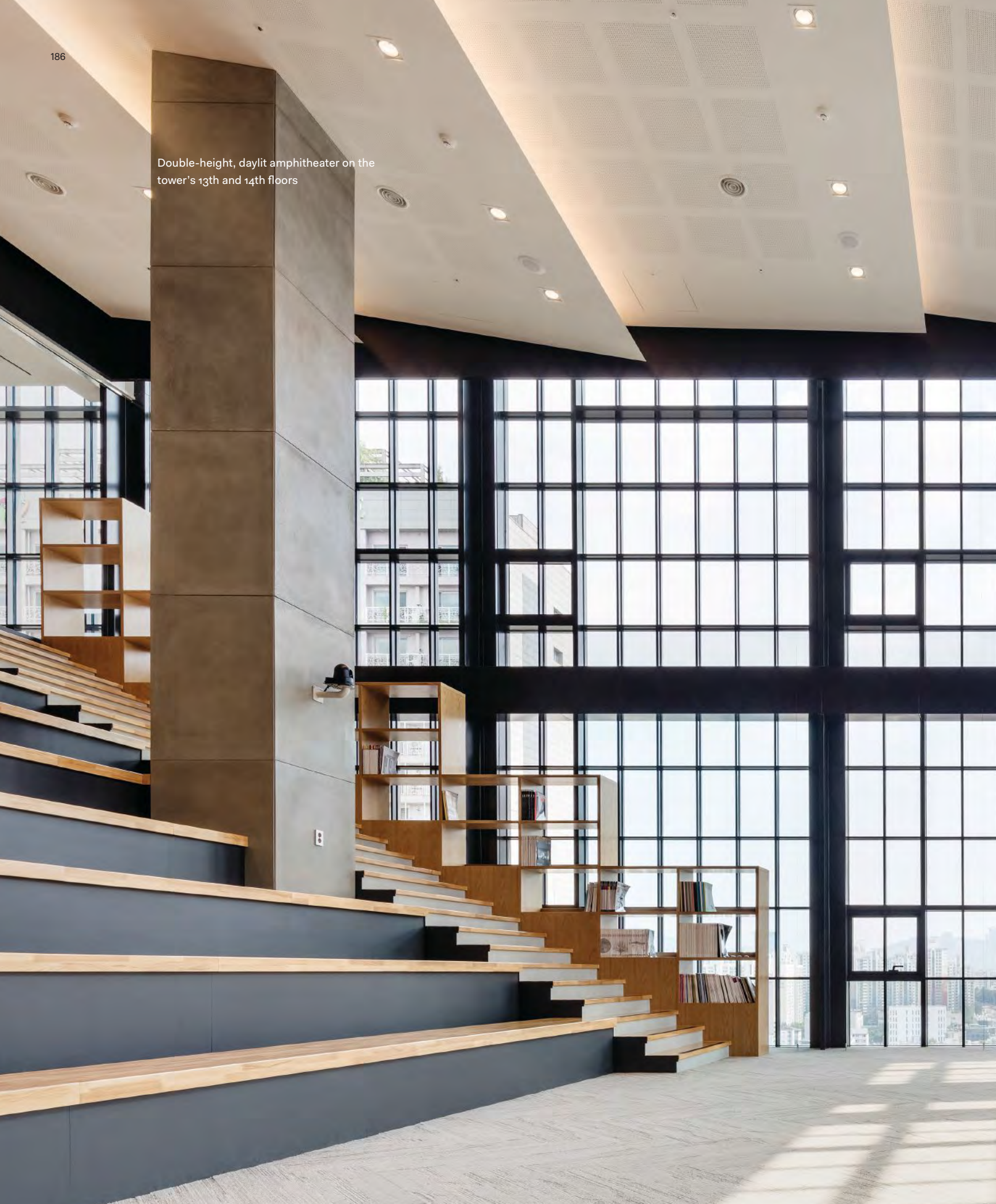
Above: Ground-floor lobby

Opposite, Top: Roof terrace

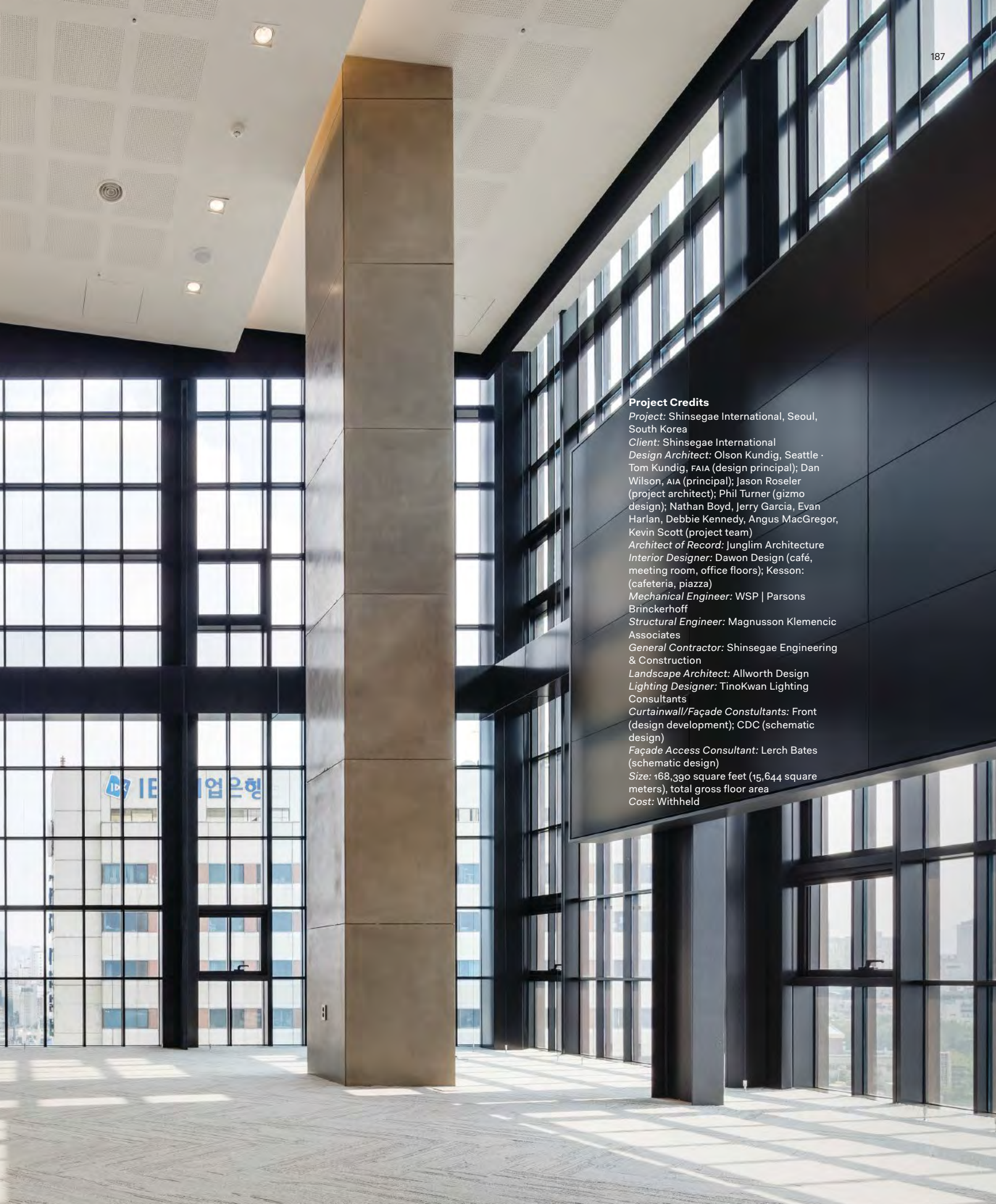
Opposite, Bottom: Typical office floor







Double-height, daylit amphitheater on the tower's 13th and 14th floors



Project Credits
Project: Shinsegae International, Seoul, South Korea
Client: Shinsegae International
Design Architect: Olson Kundig, Seattle · Tom Kundig, FAIA (design principal); Dan Wilson, AIA (principal); Jason Roseler (project architect); Phil Turner (gizmo design); Nathan Boyd, Jerry Garcia, Evan Harlan, Debbie Kennedy, Angus MacGregor, Kevin Scott (project team)
Architect of Record: Junglim Architecture
Interior Designer: Dawon Design (café, meeting room, office floors); Kesson: (cafeteria, piazza)
Mechanical Engineer: WSP | Parsons Brinckerhoff
Structural Engineer: Magnusson Klemencic Associates
General Contractor: Shinsegae Engineering & Construction
Landscape Architect: Allworth Design
Lighting Designer: TinoKwan Lighting Consultants
Curtainwall/Façade Constultants: Front (design development); CDC (schematic design)
Façade Access Consultant: Lerch Bates (schematic design)
Size: 168,390 square feet (15,644 square meters), total gross floor area
Cost: Withheld

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Sun Control Systems

DIVISION 8 OPENINGS
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Residential:

This Bare-Bones Cabin Could Shelter Weary Hikers in the Icelandic Wilderness Sometime Next Year

COURTESY ORIGINS

TEXT BY SARA JOHNSON

A recent contest, launched by competition-organizing company Bee Breeders with CDS NORD Property Developers, called for a shelter distilled to its most basic functions—a place to rest, relax, and rejuvenate—designed for hikers navigating isolated Icelandic landscapes. Toronto studio Origins designed the first-place entry, the three-roomed Terra Firma, articulated with gabion walls filled with local volcanic stone. A 3,500-square-foot timber and polycarbonate roof covers two sleeping areas as well as interior and exterior gathering spaces. CDS NORD plans to construct the first Iceland Trekking Cabin, which could be any of the top three winners, next year.

> *See more renderings of Origins' Terra Firma at bit.ly/IcelandTerraFirma.*

Perriand, Reich, the Aaltos, and the Eameses: MoMA Highlights 30 Years of Early 20th-Century Residential Spaces

TEXT BY CHELSEA BLAHUT

Residential interiors are designed to fit the bespoke needs and comforts of the future inhabitant, but an exhibition that opened this month at New York's Museum of Modern Art (MoMA) explores other factors in how designer and client craft spaces: specifically, the external social, technological, and political influences that helped shape residential interiors in the early 20th century. "How Should We Live? Propositions for the Modern Interior" presents domestic and retail spaces as well as re-created exhibitions originally produced between 1920 and 1950. The exhibition includes more than 200 pieces by designers such as Aino and Alvar Aalto and Charles and Ray Eames, and also features some of MoMA's recently acquired work by female architects and designers.

The exhibition includes personal living spaces, such as German modernist Lilly Reich's "Apartment for a single woman," which shows an attention to a new demographic in the early 1930s: the single, working woman. Another interior concept, the "Frankfurt Kitchen" (left) by Austrian architect Margarete "Grete" Schütte-Lihotzky, was a response to Germany's post-WWI housing crisis. New materials such as aluminum, linoleum, and colorful plastic were also introduced in design during this period, and appear in French designer Charlotte Perriand's dormitory furnishings for Maison du Brésil, designed for Brazilian students at the Cité Universitaire in Paris. The exhibition will be on view until April 23, 2017.

THE MUSEUM OF MODERN ART, NEW YORK

Explore Marvin's contemporary windows and doors at marvinwindows.com/contemporary

These Radical Fixtures Transform Natural Wood into Octagons, a Diatom, and an Upturned Blossom

TEXT BY SELIN ASHABOGLU

1. **Navicula, David Trubridge** Inspired by the forms of diatoms—single-celled phytoplankton found in the ocean—this CNC-milled bamboo plywood structure is fitted with a strip of LEDs and available in lengths of 59", 78.7", and 98.4". *davidtrubridge.com* 2. **2X Truss Chandelier, Stickbulb** This 54"-by-28" chandelier combines two octagonal forms. Made of reclaimed and sustainably sourced materials and fitted with 2'-long, 12V LED modules, the 119W fixture puts out 2,385 lumens at a standard color temperature of 3000K and a color-rendering index of 94. Available in four types of wood (walnut shown), with polished brass hardware. *stickbulb.com* 3. **No. 3 Loimu Pendant, Karikoski** Composed of Programme for the Endorsement of Forest Certification–certified birch plywood, this pendant measures 21.25" tall and 15.15" in diameter. Loimu is fitted with an E27 base, and the 40W luminaire is available in birch (shown) and shiny black. *karikoski.fi*

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NEW 72", OBSIDIAN INTERIOR, FRENCH DOOR MODEL IS BRAND'S FIRST WI-FI CONNECTED REFRIGERATOR.

Jenn-Air is proud to announce its first-ever, Wi-Fi connected refrigerator with Obsidian interior.* This new and innovative counter-depth, French door refrigerator features wireless connectivity and a fully functioning app. The app allows users to monitor the status of the appliance and to control its settings remotely. The sophisticated Obsidian interior appeals to the most discerning designers and consumers. Jenn-Air side-by-side refrigerators feature a 72" high, counter-depth design that helps fill the gap that a 69" high refrigerator may leave underneath overhead cabinets. Elevate your refrigerator with intelligent connectivity and style.

UNMATCHED IN ITS CATEGORY

Like the recently launched connected wall oven, this new Connected Jenn-Air Refrigerator delivers a level of control unrivaled in the market. Available for both IOS and Android devices, the app provides status notifications, temperature control to optimize storage conditions, as well as live online support and instructions. For example, you'll know if you accidentally left a door open, or if the ice maker needs an adjustment.

The Obsidian interior dramatically transforms the cabinet every time the door is opened. Integrated LED lighting beautifully illuminates while drawer lights make sure every item is visible.

Yet function is what elevates this model above the rest. The brand's patented TwinFresh™ Climate Control System features separate evaporators in the refrigerator and freezer compartments to deliver independent humidity and temperature controls. Food goes in fresh and stays that way. Additional luxury details include a soft, auto-close technology to create a smooth motion as drawers open and close, clear glass shelves and adjustable, metal door bins.

To learn more about the JENN-AIR appliance collection visit jennair.com.

*Model available winter, 2016.

JENN-AIR

Stealth Building
New York
WORKac

TEXT BY GIDEON FINK SHAPIRO
PHOTOS BY BRUCE DAMONTE

This Spread: The addition is set back from the building's façade, creating space for a terrace off the living area.

Previous Page: The rooftop addition is designed to be completely invisible from the street.

A sharply folding roof plane lies behind the cornice line of an 1857 building in New York City's Tribeca South Historic District, invisible from the street. This secret aerie caps the renovation and expansion of an apartment building that was originally a five-story commercial loft, and that boasts one of the city's oldest cast-iron façades. Dan Wood, FAIA, and Amale Andraos, partners in New York–based WORK Architecture Company (WORKac), restored the façade and replaced everything behind it except joists and party walls.

The four-condominium building contains three 1,650-square-foot floor-through apartments, plus a 1,750-square-foot addition that transformed the uppermost unit into a three-level, 3,400-square-foot penthouse. The simplex units below contain WORKac-designed cores that package kitchen, storage, and bathroom spaces in a freestanding volume with additional living space above—a testament to the glory of 13-foot ceilings.

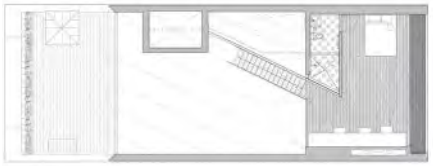
To develop the shape of the addition and conceal it from the street, the duo used a projection model to calculate what Andraos calls "a cone of vision" from a nearby street corner, the furthest point on the ground from which the building can be seen. The oblique sight line determined the roof's 15-degree slope, as well as the diagonal slash of the ceiling and penthouse staircase relative to the street. The three peaks of the irregular sawtooth roof are abstractions of the pediment, the neighboring building's pediment, and the former bulkhead, which now contains a hot tub.

The building's fifth floor, and lowest level of the penthouse, contains three bedrooms and a family room. Connected by a transparent glass-enclosed stairway that qualifies as an emergency stair, the added sixth floor, featuring an open-plan living area and kitchen with a north-facing terrace, serves as a dramatic entrance. The seventh-floor loft, reached via a steel stair, opens to a south balcony.

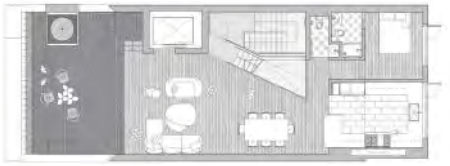
On the façade, 25 new Corinthian column capitals adorned with foliage motifs stand in for long-lost originals. Generated with Michael Hansmeyer, a Zurich-based architect and programmer, the new capitals were cast not in iron, but in malleable glass-fiber-reinforced concrete based on a CNC-cut foam model—exemplifying the sophisticated layering of preservation and invention throughout the project.

Section A–A₁

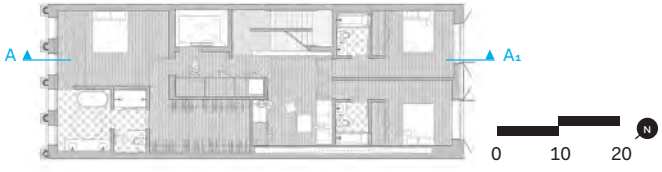
Seventh-Floor Plan



Sixth-Floor Plan



Fifth-Floor Plan



Built of thin steel stringers and treads and lined with mesh guardrails, the staircase from the sixth-floor living area leads to a seventh-floor loft with a bedroom and bathroom.

The addition's roofline creates a dramatic ceiling in the sixth-floor living space, which features the solid ash plank flooring used throughout.

Project Credits
Project: Stealth Building, New York
Client/Construction Manager: Knightsbridge Properties
Architect/Interior Designer/Landscape Architect: WORK Architecture Company, New York · Dan Wood, FAIA, Amale Andraos (principals); Sam Dufaux (associate principal); Karl Landsteiner (construction administration project architect); Chris Oliver (design project architect); Maggie Tsang, Timo Otto, Patrick Daurio
Mechanical/Electrical Engineer: Plus Group Consulting Engineering
Structural Engineer: Robert Silman Associates
Lighting Designer: Tillotson Design Associates
Restoration Architect: CTS Group
Artist, Column Capitals: Michael Hansmeyer
Code Consultant: CCBS Consulting
Size: 14,000 square feet (building, including addition); 3,400 square feet (penthouse unit)
Cost: Withheld

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Editorial: A Rising Infrastructure Lifts All Boats

Last month I participated as a juror in Gensler's annual internal design review. As you would expect of such a big firm, the projects came in many different sizes, shapes, programs, and locations. Office buildings, car dealerships, factories, and condominiums, in the U.S., China, the Middle East, and Europe. As is Gensler's custom, out of all the award winners, we picked one project as the best of the best: a clinic for Cook County Health and Hospitals System in Chicago. It brings rigorous design to an often undistinguished building type and dignity to an underserved community.

The jury met on a Thursday and Friday in Washington, D.C. Not surprisingly, given the locale and the fact that the first presidential debate was scheduled for the following Monday, the election was the topic of much conversation during breaks and meals. I didn't expect the inverse to happen, but Monday night, as I watched the candidates spar over immigration, race, gender, poverty, and the role of government, the jury kept coming to mind, and especially that hospital project.

In a rare area of agreement, both Donald Trump and Hillary Clinton spoke in favor of infrastructure spending, which should warm the hearts of architects nationwide. While Trump didn't mention his favorite initiative, the Great Wall of Mexico, he colorfully described our nation's airports as "like from a Third World country." Anyone who has flown through Orlando recently might agree.

Clinton has proposed spending $275 billion on infrastructure. Trump's plan would cost $500 billion—a figure that has not found favor on Capitol Hill. Alas, without congressional support, neither of the candidates' plans has much chance of becoming a reality. And that's tragic, for several reasons. Firstly, the nation's infrastructure seriously needs an upgrade. Not just the plumbing and wiring, or the roads and bridges, but also the airports, schools, fire stations, and, yes, hospitals. In the most recent iteration of the American Society of Civil Engineers' frequently referenced infrastructure report card, from 2013, the U.S. earned a D+. Secondly, given the historically low interest rates, never in our lifetimes will there be a more financially advantageous moment to make the investment. Thirdly, the economy and the job market could use another jolt, to push us over the line from "recovering" to "recovered," or better. And lastly, there are few smarter, more equitable ways to improve lives, which is why I couldn't help but remember the Gensler clinic (a collaboration with Forum Studio) during the debate.

The old hospital building, a 1915 Beaux-Arts landmark that provided the model for the gritty TV drama *ER*, has been shuttered for over a decade. Yet from its prominent site along Chicago's major east-west artery, the Eisenhower Expressway, it remains a depressing symbol of deprivation. The online *Encyclopedia of Chicago* describes Cook County Hospital as "open to all patients, generally poor or destitute, and often alcoholic." And almost entirely immigrant: 19th-century European settlers; blacks moving north in the Great Migration; and more recently Hispanics and Asians. When the Gensler's clinic opens in 2018, it will serve the same important constituencies. No matter who we elect as president, it's time to design better symbols, and finer realities, for every American.

STEPHEN VOSS

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