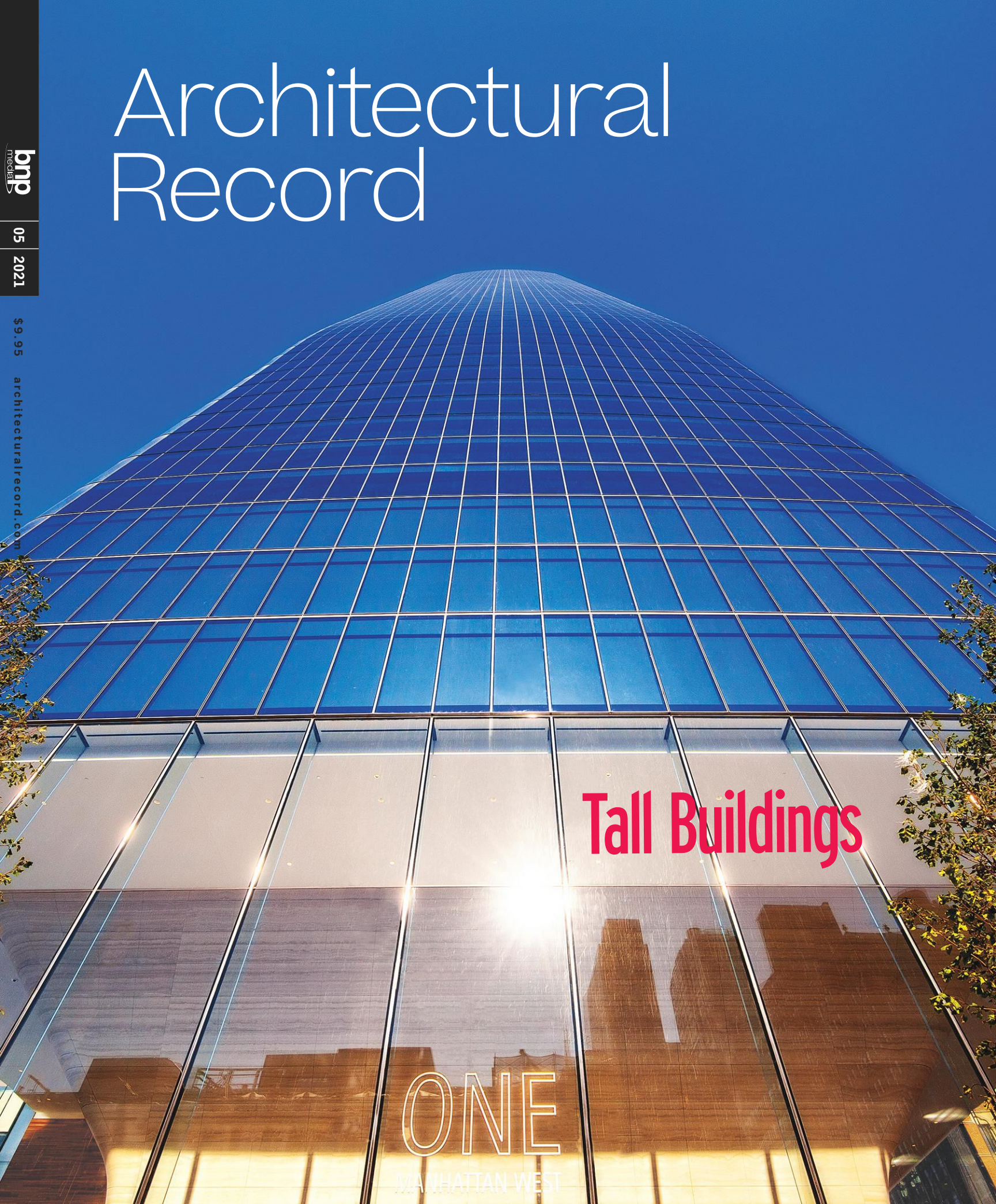
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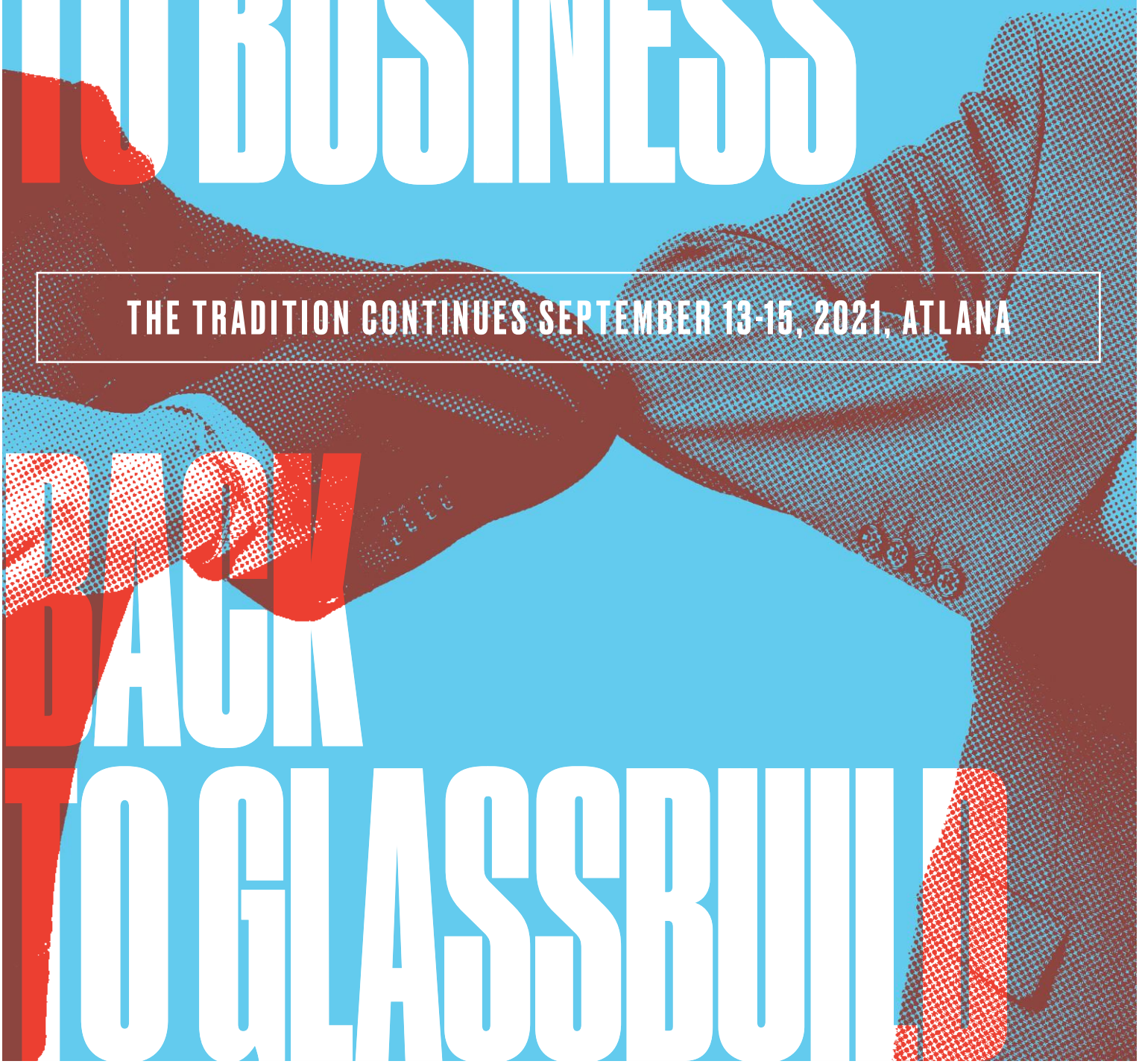
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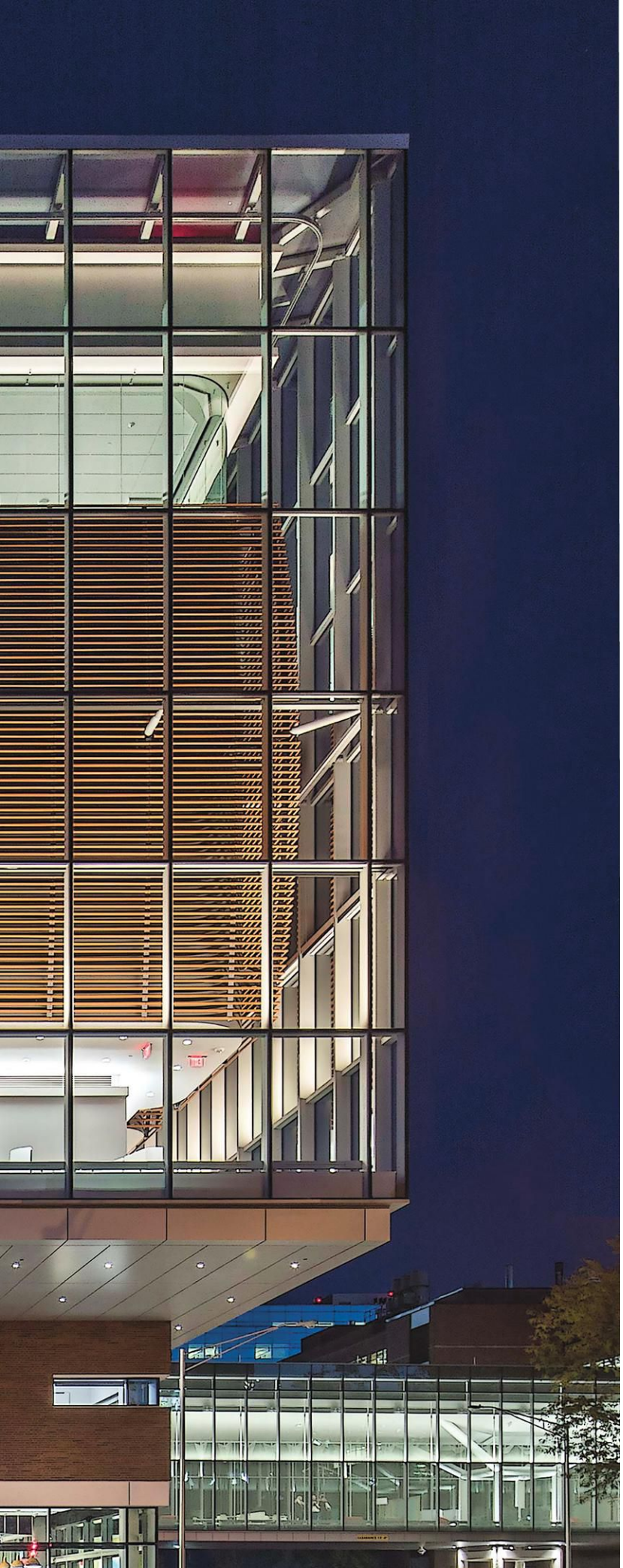
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High and Mighty

Innovative tall buildings are making a big mark on evolving metropolises.

SKYSCRAPERS are tied to the fortunes of cities. So it may seem a strange moment to celebrate tall buildings, when people are questioning—in the U.S., at least—the future of the metropolis. Will people who fled urban life during the pandemic come back to their cramped apartments? Will the workforce that's spent the last year Zooming all day want to put on a starched shirt or high-heeled pumps and commute to the office?

The answers are not yet clear, but it's likely not a matter of *if* people come back to cities but *when*. Yes, some will stay put in suburbia, but many more will pursue a hybrid work model. Big tech companies, which have pioneered the contemporary collaborative workplace, believing in the creative power of spontaneous interaction, are reopening offices, offering an array of work options. While some companies may shrink the footprint of their space, many professionals—including architects—are eager to return to in-person engagement as soon as it is safe to do so.

And whatever the new normal becomes, there will always be those who seek the energy and communion of city life.

Meanwhile, tall buildings preside over the urban ebb and flow like giant redwoods: it takes time for the seed of a skyscraper to germinate, through concept, design, engineering, financing, and construction. Yet the returns can be elusive: the Empire State Building, where RECORD has its offices, was the tallest building in the world for some 40 years, but it didn't turn a profit for the first 20. Today's supertalls, generally defined as 300 meters (984 feet) high, often don't pay back the investment—the Burj Khalifa, the world's tallest, is a loss leader—but they can be linchpins for lucrative surrounding development, particularly in Asia, as Carol Willis, the founder of the Skyscraper Museum in New York, explains in an interview (page 22).

In fact, China is clearly the nexus of this supertall economy, where 17 of the 25 tallest skyscrapers in the world are under construction.

Wherever they are being built, skyscrapers continue to capture the public imagination as they evolve dramatically through innovative engineering and design. The modernist model—an orthogonal volume of stacked floorplates—has been sidelined by asymmetric forms and structural derring-do. In the pages ahead, you will encounter some examples. With One Manhattan West in New York, SOM has created an elegantly sleek glass supertall (996 feet) that gently tapers as it rises. But the surprise is visible in the lobby, where there are no perimeter columns; the concrete-core and surrounding steel framework is expressed in the immense, travertine-clad, trunk-like pedestal that flares out like the crown of a tree. This is not a gimmick—"It's impossible to invent shapes without thinking about structure," says the building's lead designer, Gary Haney—but a solution to accommodating the active train lines that run underneath the building (page 76).

Similarly, existing infrastructure inspired BIG's stainless-steel-and-glass mixed-use tower in Vancouver, which nestles at the foot of a highway on-ramp: the squeezed footprint dictated a form, narrow at its base, that spirals up to become an orthogonal plan for most of its 53 stories (page 62). In Studio Gang's St. Louis residential tower (just 36 floors), the drama comes from the desire to provide unobstructed views and balconies, which resulted in a zigzagging facade of outwardly splayed elements (page 84). And to expedite the construction of NBBJ's swooping Rainier Square mixed-use high-rise (850 feet) in Seattle, with its broad base and curving, slender tower, the engineers employed speed core, an innovative concrete and steel-plate structural spine (page 90).

But it is in China that developers seem to embrace the most ambitious forms, as seen in Morphosis's Hanking Center in Shenzhen: a slender tower (1,148 feet high) sitting on a muscular, angled base, anchored by a detached steel-framed core (page 68). Indeed, says the firm's founding principal, Thom Mayne, "The clients are adventurous."

Punctuating city skylines around the world with dynamic peaks and spires and—at their best—meeting the ground in ways that animate and enhance the public realm, skyscrapers are not a typology that is going away. With advancing structural technology—and the very human dream of reaching for new heights—they are only going to get taller.

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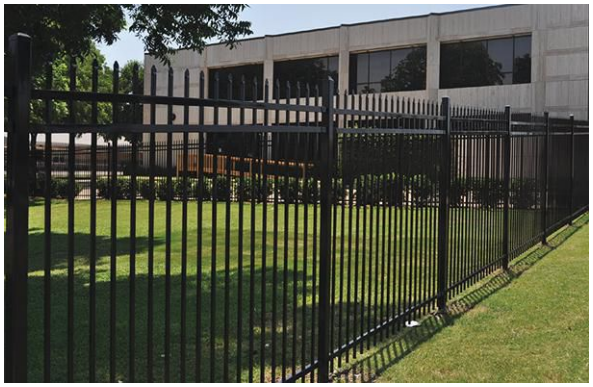
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The global pandemic has no doubt made the question this Architecture Biennale is asking all the more relevant, even if somehow ironic, given the imposed isolation . . . indeed, the theme was proposed a few months before the pandemic.

—*Hashim Sarkis, curator, 2021 Venice Biennale, on the theme "How Will We Live Together?"*

Tucson Commemorates Shooting 10 Years Later

BY BRIDGET COGLEY

"GUN VIOLENCE in this country is an epidemic," said President Joe Biden on April 8, as he outlined executive actions to curb that grim reality. In just one week in March, eight people—including six Asian women—were killed by a gunman in Atlanta, and 10 people were shot and died in a Boulder, Colorado, grocery store.

Now the people of Tucson, Arizona, have a memorial to commemorate another infamous date in America's seemingly never-ending story of gun violence: January 8, 2011, when 19 people were gunned down by one shooter while gathering in a shopping center to meet their U.S. representative, Gabrielle (Gabby) Giffords. Among the six people who died that day were 9-year-old Christina-Taylor Green and Giffords' aide Gabe Zimmerman—the first Congressional staffer to be killed in the line of duty. Giffords narrowly survived the attempted assassination with severe brain damage, and retired from her office to advocate against gun violence.

"All these years, Gabby has been fighting for gun control. When is it ever going to end?" said architect and landscape architect Tina Chee, in an emotional interview, as she reflected on Giffords's encounter with another fearsome event when her husband, Arizona's new senator, Mark Kelly, was in the Capitol on January 6 this year, as the violent mob attacked Congress to try to prevent the certification of the presidential election. Chee, along with her husband, Marc Salette, of the Glendale, California, firm Chee Salette, won a competition to design the memorial with visual artist Rebeca Méndez. Called *The Embrace*, it opened exactly 10 years after the shooting, with Giffords and Kelly attending its dedication.

With its two sharply curving forms that round like arms embracing, the memorial is meant to symbolize community and hope. Its pearlescent inner walls, of powder-coated steel panels, slant outward toward the sky, while its outer shell is composed of berms covered with local stones and plants, which will evolve and change with the seasons and are already attracting wildlife. Hundreds of small circles perforate the inner walls to reflect a breath, a heartbeat, a shot, a hole.





Curved walls and reflection pools create a sanctuary for commemorating victims of gun violence in Tucson (above), with a pathway bisecting the memorial to frame the city's courthouse (right).

After meeting with the families and friends of the deceased and hearing their stories, as well as researching the art and history of the area, Méndez created small symbols and icons for many of the openings—such as scales of justice, a butterfly (that was Green's last drawing), a bighorn sheep, and a cactus—to represent Tucson's victims: not only those from the 2011 shootings, but people who, over time, were lost to racial violence or perished in the unforgiving Sonoran Desert.

Nestled between the two boomerang-shaped landscape formations of the memorial is a pair of triangular reflecting pools, bisected by a walkway leading to the entrance of Tucson's 1929 ornate pink stucco Mission Revival courthouse. The gentle flow of water creates a calming effect for those seated on the precast-concrete benches lining the pools—now a place of gathering and contemplation. The memorial is situated in El Presidio Park, near other memorials that commemorate the Vietnam War and World War II—this one a reminder that some battles are fought at home. ■

PHOTOGRAPHY: © IWAN BAAN

Make No Little Plans

What Biden's $2 trillion infrastructure proposal could mean for architects.

BY DEANE MADSEN

PRESIDENT BIDEN laid out the framework for the American Jobs Plan, a $2.25 trillion infrastructure proposal, at the end of March. Whatever else can be said about it, the plan is breathtakingly expansive and expensive—yet represents, as the president put it, "a once-in-a-generation investment in America." The proposal put forth an almost incomprehensible scale of spending—it has already been decried as too large by conservatives and too small by Green New Deal proponents—but is envisioned as igniting the American economy, not only by financing conventional infrastructure such as bridges and tunnels, but also in renewing and expanding affordable-housing stock and public-education facilities, and funding green technology. Biden, acknowledging it is big and bold, said, "We can get it done."



President Biden's ambitious plan includes repairing infrastructure and expanding affordable housing.

PHOTOGRAPHY: © EVAN VUCCI/ASSOCIATED PRESS

How it gets done, when it gets done, and at what ultimate price tag, remain the trillion-dollar questions. The biggest slice of the proposal's pie goes to infrastructure repair, with $621 billion (roughly 28 percent of the plan) allocated to transportation-related projects. While that may seem like a lot of roadwork—and $25 billion of that is set aside for airports—the plan also includes equitable remediation strategies, such as $20 billion to "reconnect neighborhoods cut off by historic investments [read urban renewal and highways that cut through cities] and ensure new projects increase opportunity, advance racial equity and environmental justice, and promote affordable access."

Related to such infrastructural proposals are numerous parts of the plan that address the concerns of architects and will require their expertise. Even before Biden unveiled his program, a team from the American Institute of Architects (AIA) urged Congress in February to include $300 billion to fund green infrastructure. The Biden-Harris plan gets close, with $100 billion dedicated to achieving carbon-pollution-free power by 2035, and another $180 billion allocated for research, development, and deployment of climate-science solutions. Another $50 billion targets long-term resilience of the country's entire infrastructure, to mitigate flooding, effects of extreme weather and climate change, and sea-level rise.

Kara Kempski, director of federal relations at the AIA, points to the importance of the plan's sustainable initiatives, which could help reduce the "roughly 40 percent of greenhouse-gas emissions that come from our building stock." In addition, she notes, buildings are a "significant part of this proposal: there are investments in affordable housing, VA hospitals, airports, schools, and federal facilities. That investment is great to see, along with the language about [being] carbon-smart, resilient, and equitable." The AIA is advocating that all new buildings be carbon zero by 2030 and all buildings achieve that by 2040. To reach those targets calls for "some investment from all levels of government," she says.

For the architecture profession, the biggest impact of Biden's plan would be the $213 billion investment in affordable housing "to produce, preserve, and retrofit more than 2 million affordable and sustainable places to live." That includes $20 billion for the Neighborhood Homes Investment Act, which would build or rehabilitate roughly half a million low- to middle-income homes. The plan further apportions $100 billion for upgrades to public schools, $25 billion for childcare centers, and $12 billion for community colleges. "There's only about 36 percent available affordable-housing units for every family that would qualify nationwide," says Kempski. "So, clearly, we need significant investment to make up the difference there."

The proposal, as it currently stands, has already been called a nonstarter by Senate minority leader Mitch McConnell, based on both its cost and its content. Myriad details would have to be ironed out in House and Senate committees before anything gets passed. Just for comparison, the recent Covid-19 relief bill cost $1.9 trillion, the 2009 American Recovery and Reinvestment act was $840 billion, and the New Deal passed, in various bills from 1933 to 1937, allocations of roughly $41.7 billion—or approximately $841 billion in 2021 dollars. The American Jobs Plan's $2.25 trillion proposes spreading this cost over the next 10 years—with an estimated investment of 1 percent of GDP over the next eight years—an amount overall that is less than half of the $5 trillion climate policy that then-candidate Biden offered in June 2019. His administration seeks to pay for this plan by eliminating fossil-fuel producers' tax incentives, while raising corporate income taxes from 21 percent to 28 percent.

That corporate-tax increase alone may be enough to scuttle this infrastructure plan as currently envisioned: as Politico reported, despite early White House outreach, McConnell has indicated that the tax hikes make the infrastructure bill impossible for Republican senators to support, meaning all the Democratic senators would have to vote in its favor for it to pass. And some on the left feel it does not go far enough, relative to the $10 billion, 10-year Green New Deal introduced in 2019 by representative Alexandria Ocasio-Cortez of New York and senator Edward J. Markey of Massachusetts. Given the expansiveness of the infrastructure proposal, it may take the rest of the term to reach agreement, postponing the start of the country's rebuilding until consensus on its scope can somehow be reached. ■



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A Rare Private Residence Designed by Frank Gehry

BY CATHLEEN MCGUIGAN

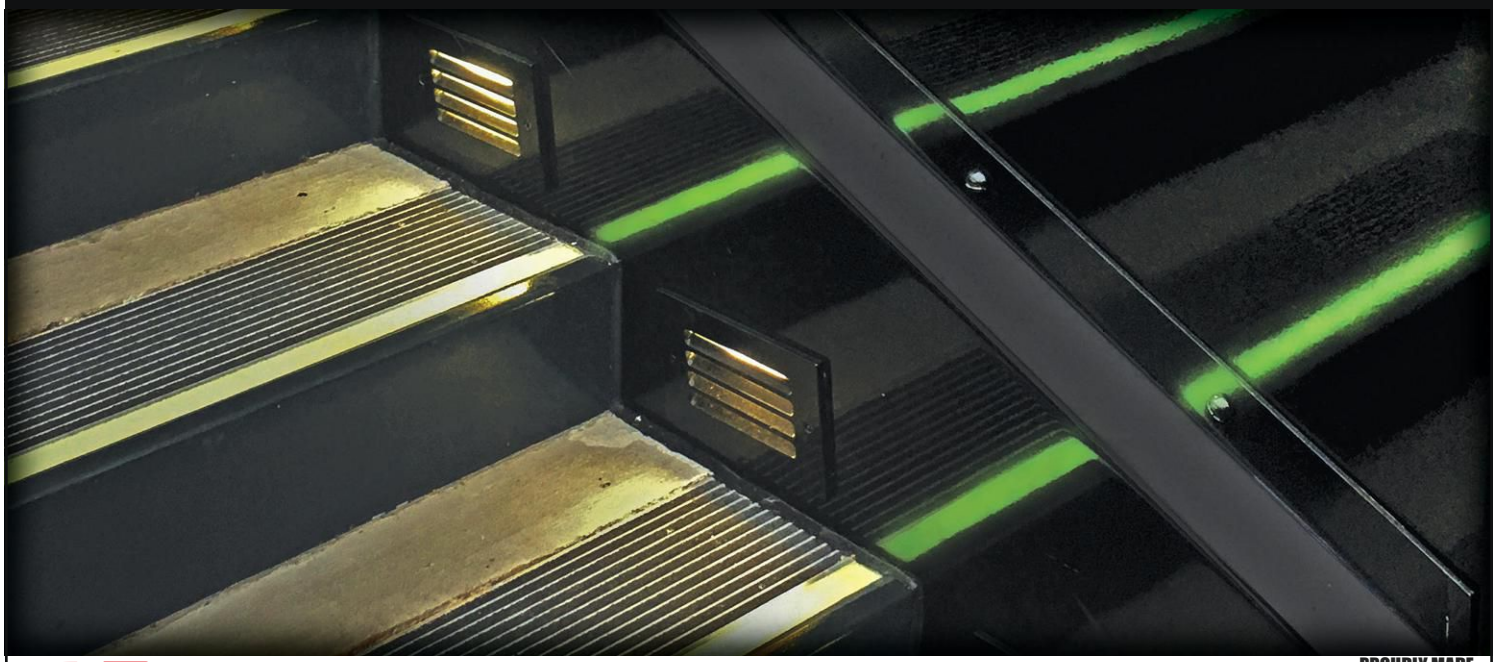
FRANK GEHRY is emerging from the Covid lockdown just like the rest of us, but he is surely busier than most. At 92, he continues to work at every scale—from ongoing plans for the 51-mile-long Los Angeles River basin to creating an art installation based on the Mad Hatter's tea party, a work that was inspired by his 5-year-old granddaughter. While the $1 billion mixed-use Grand complex, across from Disney Hall in Los Angeles, that he designed for the developer Related, is well under construction, much of the architect's work these days is philanthropic. And projects long in gestation are finally finishing. His restoration and reimagining of the Philadelphia Museum of Art opens to the public May 7 (a second, final phase has been designed but is not yet being built). In the south of France, the Luma Arles tower for the arts will debut in June.



IMAGES: COURTESY GEHRY PARTNERS

But one typology Gehry rarely designs these days is the private residence—which makes the family compound he is creating in Cabo San Lucas, Mexico, surprising, especially given that the commission began with a cold call. On a spectacular site—a high, stony outcropping of land with views of the Pacific on one side and a marina on the other—he has designed a collection of structures for the multigenerational Mansur family. At a total

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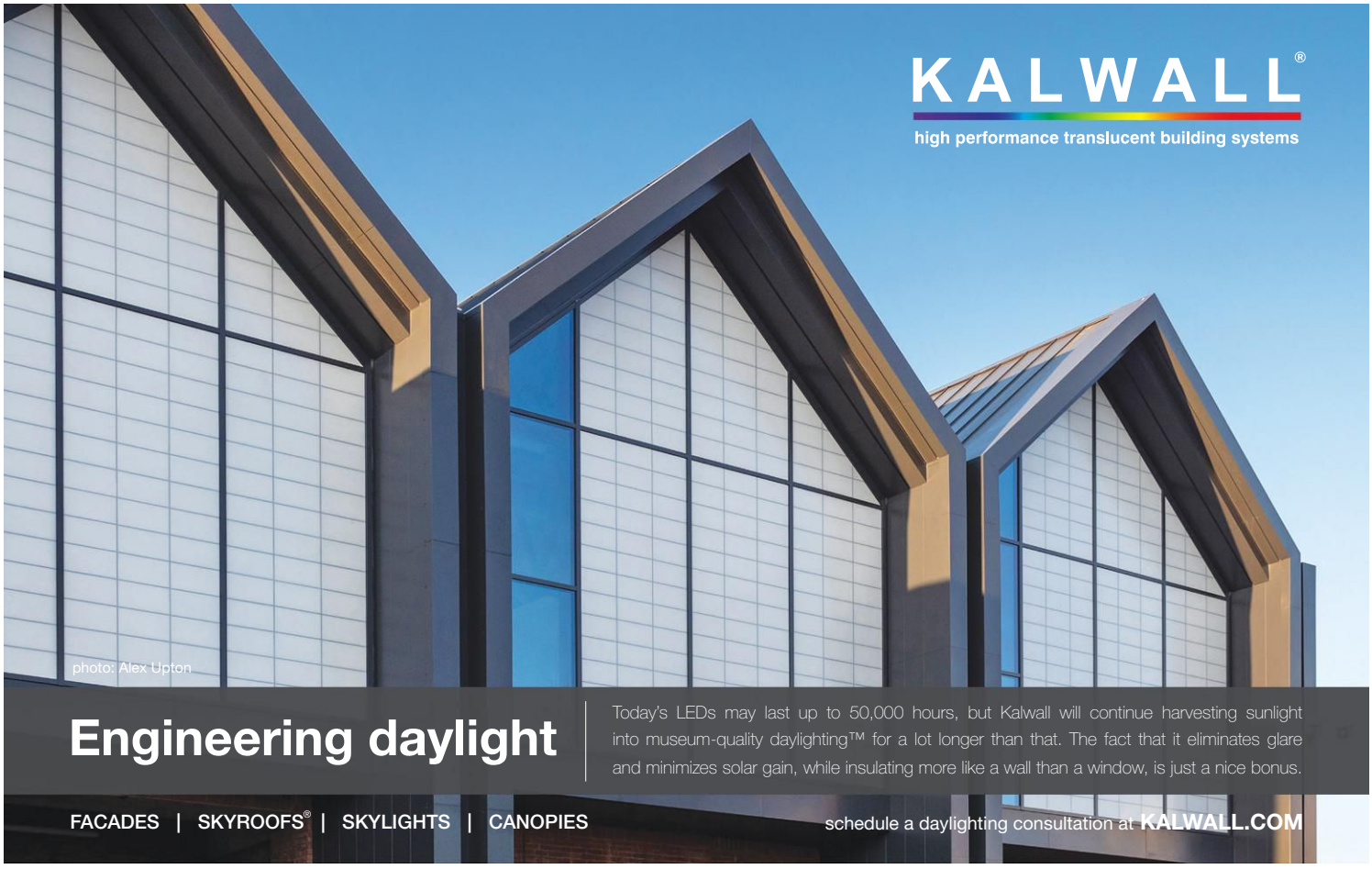


Two views of the model for the compound, on a promontory in Cabo San Lucas (opposite and above).

of more than 50,000 square feet, the compound comprises eight individual "junior" suites, built largely of stone and glass, with rooftop terraces shaded by canopies of steel, which will be colorfully embellished on the underside with art created by Alejandro Gehry, the architect's son. The common spaces include pavilions for living/dining and formal entertaining, wrapped in linen-finish stainless steel, with piers clad in stone, plus a bar/lounge and a spa.

A private family resort, it is hardly modest in scale or engineering—an access road to the site, including a tunnel, is currently under construction. Yet images of the model provided to RECORD suggest that the design is free-spirited—an exuberant, playful cluster of volumes, with rippling canopies, nestled onto rugged terrain. And "play" is a word Gehry likes to use to describe his design process—experimenting, trying different things—so it matters that clients embrace the journey as well as the final architecture.

How did these strangers win over Gehry? According to the architect, he connected to both the site and the clients, who knew and appreciated his work. "It was just the vibe of the family," he says. Even more important, the relationship grew as the design unfolded over several years. "I love the interaction—that camaraderie, that collaborative spirit," the architect says of working with the clients. "They're just great partners; they know how to play with us." ■



The State of the Supertall: Carol Willis

BY JAMES S. RUSSELL, FAIA



WILL THE APPEAL of skyscrapers endure, even as pundits again predict the end of the office version—thanks to remote work? RECORD spoke with Carol Willis, the founding director of the Skyscraper Museum in Manhattan, to take the temperature of commercial construction's hothouse flower—the supertall. (The museum's definition of supertall, distinctly its own, is any building that exceeds the Empire State Building's 1,250 feet.) Her latest exhibition, *Supertall! 2020*, traces the tall-building type through eight examples as a perpetual reconciliation of architectural art, engineering prowess, and cash cow. It is online—at skyscraper.org—along with video talks by the architects and engineers who designed the buildings.

Supertall skyscrapers are expensive, financially risky, and can take a decade or more to finance and build. Does ego overcome economic reality?

Supertalls can be about dreams, the urge to build icons, and ego—but they have got to pay back. Adrian Smith [designer of the current record holder, the 2010 Burj Khalifa] said that there is publicity value in building the world's tallest building. This is not new. Famous photos taken by Lewis Hine were commissioned by the Empire State Building to create a worldwide storyline of its construction.

The Burj is also an example of the supertall as loss leader. It may not have succeeded on its own terms, but it developed so much value. The surrounding condominiums, hotels, mall and entertainment venues were like metal filings attracted to the magnet of the Burj.

The Chinese supertalls work in the same way. A parcel desirable for its waterfront-development potential was master-planned with parks and amenities to be anchored—at the insistence of officials—by the 1,500-foot-tall Suzhou International Finance Square, by Robert Witlock of KPF. This triangulation of government-owned land, the government master-planned city, and its strategy for urbanization is a structure of real-estate development that is foreign to the U.S. mind.

Supertall development has shifted to Asia, where most supertalls are mixed use, stacking offices, hotels or serviced apartments, and condos on top. The mix can be complementary, making the business plan work, but mixing uses also enlivens urban development.

How has engineering evolved with the supertall?

A key difference is concrete. In the mind's eye, you get the Lewis Hine photo of the Empire State Building's ironworkers, sitting on the steel-I beam eating lunch against a background of nothingness. The winds that whip around at these great heights can be extreme, so the concrete core is weighty, to pull the forces down to the ground and keep the building stable. In New York, super-slender towers require a really rigid concrete structure because they are subject to even more of a wind-induced tuning-fork vibration.

Supertalls are criticized as skyline-mutilating baubles of exploitative wealth. Is the type now hopelessly tainted?

In the U.S., we get to argue over every parcel, but the global question is, how do you accommodate the massive number of rural people who are pouring into urban centers? Over the last three or four decades, 300 million people have moved from rural western China to the urban east—the largest migration in human history.

These instant cities, where the iconic tower marks the urban consolidation of businesses and global trade, are driven by government policy that recognizes the sustainability benefits of urbanization and densification, complemented by transit, parks, and amenities. New York experienced this in the early 20th century, when explosive growth and transformation led to such early skyscrapers as the Woolworth tower and Metropolitan Life building. ■

James S. Russell, FAIA, writes about architecture and cities. He is the author of the book The Agile City: Building Well-Being and Wealth in an Era of Climate Change.

Shim-Sutcliffe Wins RAIC Gold Medal

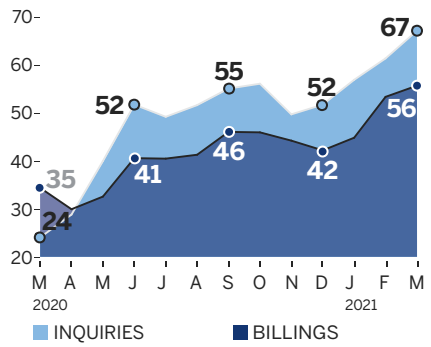
Toronto-based firm Shim-Sutcliffe, founded by Brigitte Shim and A. Howard Sutcliffe, has been awarded the 2021 Gold Medal by the Royal Architectural Institute of Canada, the country's most prestigious architecture award. Partners in life as well as practice, they are currently working on a home of their own and an Ace Hotel, both in Toronto, as well as projects in Moscow and Honolulu.

National Building Museum Reopens

After a 16-month closure due to the coronavirus pandemic and prior renovation work, the National Building Museum in Washington, D.C. has reopened with several new exhibitions and a refreshed visitor center.

Diébédo Francis Kéré Awarded U.S. Medal

The Burkina Faso–born architect was awarded this year's Thomas Jefferson Foundation Medal in Architecture by the Monticello-based foundation and the University of Virginia. Known for his communal approach to building in his home country, using local materials and techniques, Kéré runs his eponymous studio in Berlin, where he received his architectural degree at the Technische Universität.



ABI Inquiries Continue to Grow

The American Institute of Architects reports that the Architecture Billings Index (ABI) score for March was 55.6, up from 53.3 in February and 44.9 in January. The score is a sign of continuing progress for the industry after a year of decline. (A score below 50 indicates decreasing billings.) Design inquiries and contracts are growing steadily as well, now at 66.9 compared to 61.2 last month.


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Can the Mundane Be Captivating?

The curators of the U.S. Pavilion at the 2021 Venice Biennale make the humble American wood frame the star.

BY CLIFFORD A. PEARSON



THERE ARE many things in our surroundings we take for granted because they're everywhere—they're simple and they work. But sometimes their very ubiquity makes them significant: think of wood framing, a system so basic and straightforward that it is used to build more than 90 percent of all housing in the United States. Paul Andersen and Paul Preissner, curators of this year's U.S. Pavilion at the Venice Architecture Biennale, shine a spotlight on this humble method of construction to explore what it says about America's history and our attitudes toward labor and the built environment.

Sometimes dismissed as "stick construction" and usually ignored by the architectural academy, wood framing reveals much about American design and building. "It's ad hoc and allows for on-site changes and improvements," says Preissner. "It's not uptight." The same might be said of this year's U.S. Pavilion. Instead of getting lost in the weeds of theory or postulating on the latest "ism," Andersen and Preissner cheekily ask if the mundane can be illuminating or even, perhaps, captivating.

The story begins on the American frontier, where, in the 19th century, settlers used what they found—trees, lots of them—and the skills they had, often rudimentary, to erect their homes, barns, stores, and places of worship. A few workers with hammers and saws could use the dimensional lumber from local mills and the cheap nails from new factories to put up a building in very little time. Through trial and error, they devised a method of construction that was flexible and forgiving. In the Old World, wood buildings tended to be heavy timber structures that required more expertise, better tools, and more thought. In the New World, pioneers erected lightweight frames with slender two-by-fours and 2-by-6s in a system that relied on repetition and allowed a degree of sloppiness in conception and craft.

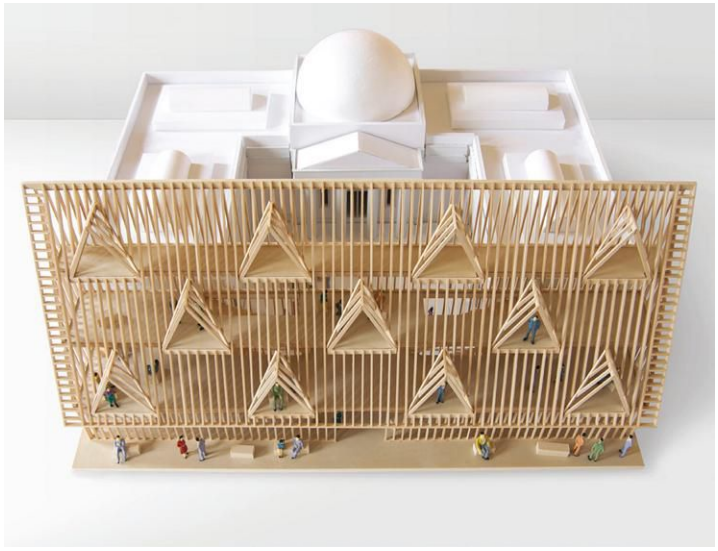
"Improvisation and a certain resistance to authority are American values you can see in this method of construction," says Preissner. "It's an open system that allows for unlimited creativity in form and design," adds Andersen.

Andersen and Preissner, who both teach architecture at the University of Illinois, Chicago (UIC), run their own practices—Preissner in Chicago and Andersen in Denver—but have collaborated on small-scale projects in the past. Anderson has a long interest in popular culture and history, while Preissner is fascinated by notions of the banal. His first monograph, *Kind of Boring*, was published this year by ACTAR.



The two curators take sly pleasure in revealing what's normally tucked behind drywall and in giving a supporting actor a star turn. In Venice, they will introduce their subject in dramatic fashion with a four-story wood-frame structure that acts as a walk-through stage set, rising in front of the U.S. Pavilion. As designed by Andersen and Preissner, this 40-foot-tall, 88-foot-wide construction—all frame and no cladding—engages Delano and Aldrich's 1930 Neoclassical pavilion in a lively conversation about what architecture is and where it comes from. Its enormous pitched roof, punctuated by rows of triangular dormers, is a three-dimensional sketch: an unfinished mansion of many rooms, open in a characteristically American way. While it closes off the old building's front courtyard, it will offer visitors the chance to climb three levels and look out





This year's installation will transform the U.S. Pavilion (above) by adding a four-story wood-frame structure to enclose its front courtyard (left and opposite), shown here as models.

toward the other national pavilions in the beautiful Venetian Giardini. (A light steel mesh attached to various structural elements will prevent people from falling as they touch the raw lumber, inhale its fresh scent, and engage directly with American framing.)

While those 19th-century settlers had access to tall, old-growth trees for the balloon frames they developed, their descendants had to use shorter pieces of lumber from less mature trees. So the balloon frame gave way to the platform frame, with posts running from floor to floor rather than from ground to roof. This reduced the chances of fire's shooting up tall posts and igniting one floor after another. It also led to the standardization of lumber sizes, making the system more affordable and available—and uniquely democratic. Today, farmed trees are a renewable resource that capture carbon as they grow and require much less carbon to process than concrete or steel. Efficient milling equipment leaves little waste, and even bark can be used for siding and paneling.

To explore the history of American framing in Venice, a dozen wood models built by UIC students, at a scale of ½ inch to 1 foot, will be on display, showing historic and cultural typologies ranging from a 19th-century balloon-frame warehouse and a round barn to a Sears mail-order house, a single-wide mobile home, and an elongated geodesic dome from a countercultural 1960s commune. As they move from one gallery to the next, visitors will see changes in the methodology, form, and detail of these structures. The curators commissioned Daniel Shea to create a series of photographs documenting fir and pine forests, while another series of photographs on view, by Chris Strong, will look at the raw materials and the people who work in lumber mills and yards, and on construction sites. In the pavilion's central rotunda, there will be a model of Spike's doghouse from the *Tom & Jerry* cartoons—an amused nod to the intersection of popular culture and American construction. In the courtyard, visitors will be able to relax on wooden furniture created by UIC students in collaboration with Ania Jaworska and Thomas Kelley, who teach at UIC, and Carrie Norman, who is Kelley's design partner.

Both Andersen and Preissner had participated in the U.S. Pavilion at the 2000 Biennale as students, Andersen working under Greg Lynn's direction at UCLA and Preissner under Hani Rashid at Columbia. But neither knew of the other's involvement until they visited Venice together in 2019. That early taste of the global event whetted their appetite for competing to be curators of this year's pavilion, and convinced them of the importance of engaging their own students in its creation.

Though originally scheduled for last spring, the architecture Biennale was derailed by the pandemic—at first pushed back to last September and now slated to open on May 22 and close on November 21. At press time, Italy was in lockdown, due to a Covid surge, but Biennale officials seem determined to press forward with the May opening. Along with exhibitions in the Arsenale—the enormous complex where thousands of workers once built Venice's fleets—and the Central Pavilion, 63 country pavilions will open, the same number as last time, according to the Biennale. The director of this year's Biennale, Hashim Sarkis, dean of the School of Architecture and Planning at MIT, has organized the event around the theme "How Will We Live Together?"

Andersen and Preissner developed their ideas for the U.S. Pavilion before Covid struck and have made only minor changes—to the installation's circulation (one direction now) and seating (limited)—in response to the virus. Says Andersen, "Luckily, our topic is timeless, so it works as well today as it would have before the pandemic." ■

The U.S. Pavilion is presented in conjunction with the Peggy Guggenheim Collection in Venice, which owns and manages the building, and the U.S. Department of State's Bureau of Educational and Cultural Affairs. ARCHITECTURAL RECORD *is the media sponsor of the 2021 installation.*

PHOTOGRAPHY: © PAUL ANDERSEN (OPPOSITE 2 AND BOTTOM); MATTEO DE FINA (TOP)



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HOUSE of the Month

ARCHITECT ARTHUR CASAS DESIGNS A SEASIDE DWELLING NEAR SÃO PAULO FOR A LONG, NARROW SITE. **BY WENDY MOONAN**



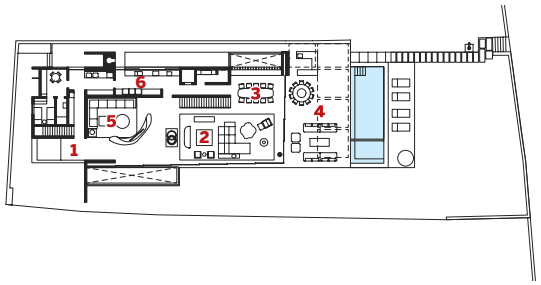
One long side of the rectangular house faces a private street (above); the living space opens up at the northeast corner (below).



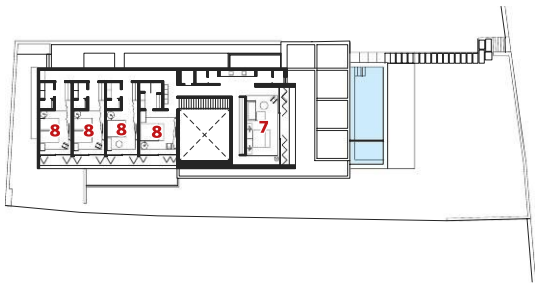
CASAS—Spanish or Portuguese for "houses"—is the perfect surname for the São Paulo–and New York–based architect Arthur Casas, who in the past 35 years has designed distinctive contemporary residences all over the world. The newest one is in the unspoiled Brazilian beach town Praia da Baleia, São Sebastião, some 90 miles outside São Paulo.

Its unique challenge was its extremely narrow site. "How was I going to put a dwelling and its extensive program in a not very large plot, with only 45 feet facing the sea?" he asks—the house was to be 10,000 square feet on 12,500 square feet of land. Rather than building up, Casas turned to his signature move: extreme, low-slung horizontality. "The horizontal shape is part of Brazilian modern architecture," he says. The short side of the rectilinear volume facing the Atlantic has direct access to the beach. On one of the long sides is a private street, on the other, a wall of lush vegetation.

The two-story, seven-bedroom concrete-framed house is a sleek



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SECOND-FLOOR PLAN

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3 DINING ROOM
4 TERRACE
5 HOME THEATER
6 KITCHEN
7 MAIN BEDROOM
8 BEDROOM

PHOTOGRAPHY: © LEONARO FINOTTI







The short end of the rectangle opens up to the sea (right). The central living area is illuminated by a double-height skylight (middle). Cables edge the stair (bottom).

minimalist form. A third level, underground, required double walls to contain the sandy terrain. The facades are clad with small beige bricks made of concrete.

"I tried to use the color of the sand as the basis of the palette, internally and externally," Casas says. "My intention was to create an amalgam between the sea and the building." While on the second floor the bricks are stacked horizontally, below they are set vertically, with triangular indentations to create shadows and texture.

Casas's clients are a couple who wanted a weekend house for themselves and four sons. The upper floor has four bedrooms and a main bedroom suite with a direct view to the sea. The below-ground floor has two guest suites, a game room, and a spa. Openings in the gardens on both the eastern and western sides allow natural light to penetrate the game room and suites.

The open-plan main floor is the showstopper. With its 10-foot ceiling and equally tall sliding glass walls on the north (facing the ocean) and west sides, the occupants are plunged into nature. "With this visual permeability," Casas says, "both beach and landscaping seem to penetrate the interior."

The long, open space has four seating and two dining areas for entertaining. In the center, a rectangular opening, cut into the ceiling, extends 22 feet through the second level to a skylight. The luminosity of this vertical shaft of space, Casas notes, dramatically opens up the horizontal volume.

A round concrete pillar in the northeast corner supports a concrete-framed pergola by the pool as well as the floor slab for the master suite. An inverted, prestressed-concrete beam on the west edge, outside the sons' rooms, serves as the guard rail for the second-floor corridor.

The range of materials is purposely limited. Floors are pale Montdore limestone. The ceiling of the living room is oak, as is the dramatic stair edged with vertical metal cables that extend through the three floors. Accoya, a local, sustainable, weather-resistant wood is used for doors and louvers.

The pandemic has changed Casas's thinking about architecture: "People value their house for relationships and physical health. Since families are spending more time together, the interior design, landscape design, and architecture need to stand out." ■

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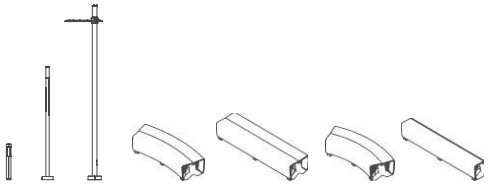
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LANDSCAPE

IN CALGARY, ALBERTA, A TEAM REMEDIATES A FORMER QUARRY AS A PARK AND WATER-TREATMENT CENTER. **BY KARA MAVROS**



IN THE foothills of the Canadian Rockies, Calgary's parks system is built along the backbone of the Bow River, which supplies most of the city's water. A decade ago, it would have been hard to imagine what the abandoned gravel quarry alongside a stretch of that 365-mile-long tributary would become. Today, transformed into Dale Hodges Park (named for a beloved Calgarian politician), the former quarry comprises nearly 100 acres of integrated park, public artwork, and water treatment serving the northwestern part of Alberta's most populous city.

Such an undertaking called for a large, and highly specialized, team: Calgary-based O2 Planning + Design led on the park's landscape architecture, AECOM handled civil engineering, Source 2 Source focused on environmental design and hydraulics, and local group sans façon created the artworks (operating through Watershed+, a city-commissioned program for an environmental public-art plan).

The overall layout was informed by the journey of untreated stormwater through the site, says O2 principal Matt Williams. Starting at a new Nautilus Pond, water is piped in from upstream catchments, and sediment is removed through a gravity-fueled whirlpool.



Along the Bow River (above), the design team created riparian habitats in the restored landscape with pedestrian trails and boardwalks (right).

Then, depending on flow strength, it travels on one of two paths before exiting downstream into the river. Between the pond and eventual outfall, ribbons of meandering marshes, wetlands, and a restored stream lead off from the flow, adding another layer of filtering and providing "breathing room" for the river to expand—an added element of flood protection for the Bow, says Williams. Visitors, too, follow a similar trajectory across gravel footpaths, trails, and boardwalks, passing a handful of public artworks—including a cascading water feature at the center of the Nautilus pond—all embedded in the fabric of the park.

"A lot of the work was preparing the ground to support plant life after the quarry," says Williams. "There was nothing of ecological value on the site at all." To enable plant diversity and optimal riparian (shore) habitats for birds and ducks, the landscape architects crafted subtle grading around the wetlands to create different pockets of north- and south-facing exposures. The team planted native species, including dogwood and willow, keeping all four seasons in mind and providing color even during the harsh Canadian winter.

While aesthetic value will always be paramount, notes Williams, public parks "can't just be pretty places to spend time outdoors—they need to, and can, provide greater benefit to the city." ■

PHOTOGRAPHY: COURTESY O2 PLANNING + DESIGN

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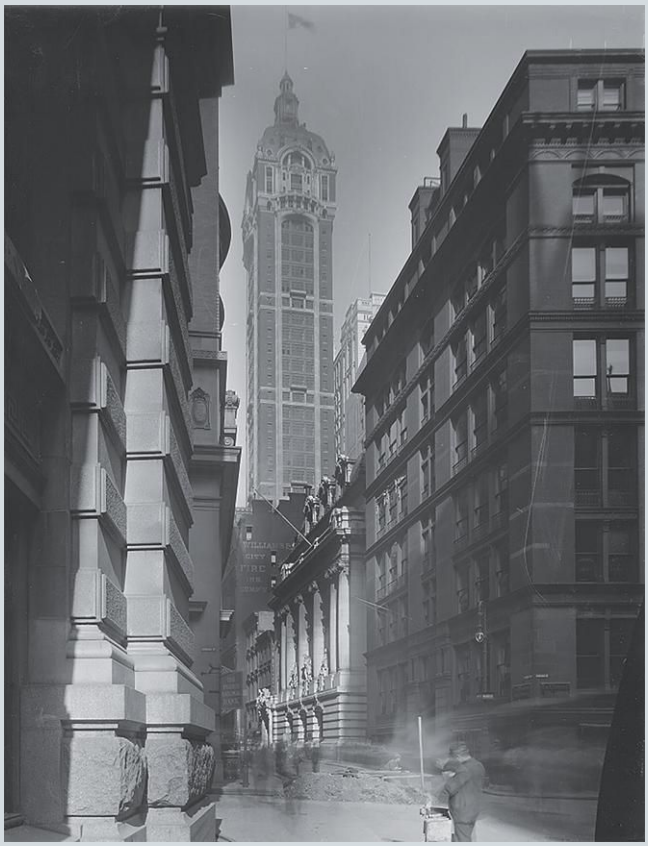
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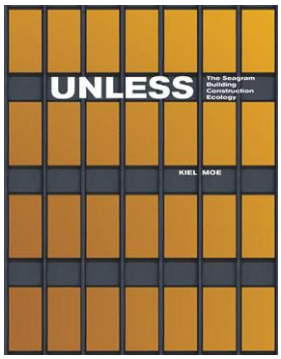
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A Modernist Icon Through a New Lens

REVIEWED BY ERIC HÖWELER, AIA

Unless: The Seagram Building Construction Ecology, *by Kiel Moe. Actar, 316 pages, $34.95.*

SOME of the most pervasive myths of modern architecture surround the Seagram Building, the emblem of standardization—manifested by the extruded shaft of the tower, the applied bronze I-beams that are stand-ins for the structural steel frame encased in concrete within, and the urban stance of the building, an autonomous prismatic object set back on a spare granite plaza. Every aspect of Mies van der Rohe's building has been extensively documented, illustrated, and imitated. Kiel Moe's critical assessment of this Modernist icon reads it through the lenses of material ecologies and environmental load. In the process, he demolishes so much of its mythology.



The book's title implies a dire warning: "Unless architects begin to describe buildings as terrestrial events, processes, and artifacts, architects will—to professional and collective peril—continue to operate outside the key environmental and political dynamics of this century." Moe assesses architecture as a material, geological, and ecological artifact—essentially the substance of which it is made, and the embodied energy and labor that it represents. To do so, he performs a painstaking material audit of the Seagram Building, modeling and measuring the quantities of steel, concrete, and glass that make up the tower's 38 stories.

Elaborating on a method he developed in his previous book, *Empire, State & Building*, Moe tracks the building components back to the fabricators that produced them, to the quarries and mines where the raw materials were extracted, and ultimately back to the ground. He sees the Seagram Building as an "exquisite pile of technomass, attached to perhaps less exquisite inequities in its world."

Moe derives the term "terrestrial," for his investigation, from French sociologist Bruno Latour, as pertaining to "all the human and nonhuman, organic and inorganic, 'natural' and 'unnatural' dynamics of entities on the surface of the planet." The shifting of materials in the making of a building creates "environmental loads," which Moe argues are being asymmetrically displaced from centers of power and wealth onto the peripheries where these materials come from. Only by understanding the expanded web of materials, their sources, waste, by-products, and toxicological impacts can we gain a true accounting of the real environmental footprint of architecture.

The Seagram Building's "bronze" I-beams are actually brass—a combination of copper and zinc. Probably the copper was a mix of recycled and new copper, likely to have come from the Chuquicamata mine in Chile's Atacama Desert. Here Moe finds a mining town crushed, literally, by the tailings from the open pit mine, and a history of illnesses among the workers. In tracing the production of the famous I-beams, we learn about the custom die operation, and the meticulous process of straightening and hand-polishing the extrusions to achieve the perfect "machine-age" look. In Butler, Pennsylvania, the source of the pink-tinted glass Mies specified, he details the history of the Franklin Glass factory, the pouring and casting of the glass, and the labor of polishing the unique lites. The story of the company is one of growth, obsolescence, bankruptcy, and factory closure.

Mies's masterpiece is not emblamatic of modern standardization but is a bespoke artifact, and that comes at a high cost: it was the most expensive office building ever constructed at the time, and now Moe is calculating the environmental and social costs.

But he is not interested in vilifying or valorizing the building or its creators. He wants to completely reevaluate the way we think about architecture, the way we describe it, and the way we value it. Architecture has tremendous agency and responsibility. This book demands that we rethink the very substance of architecture and its expanded footprint so we can understand its larger impact in a "terrestrial" world. ■

Eric Höweler, AIA, is a founding principal of Höweler + Yoon, and an associate professor at the Harvard Graduate School of Design.











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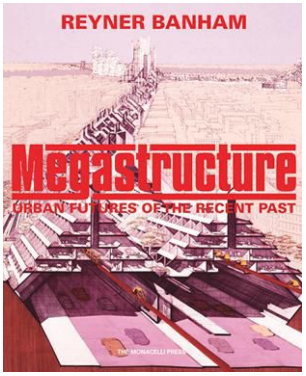
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Architecture of Another Era, Just in Time

Megastructure: Urban Futures of the Recent Past, *by Reyner Banham; foreword by Todd Gannon. Monacelli Press, 232 pages, $50.*

REVIEWED BY ANTHONY VIDLER

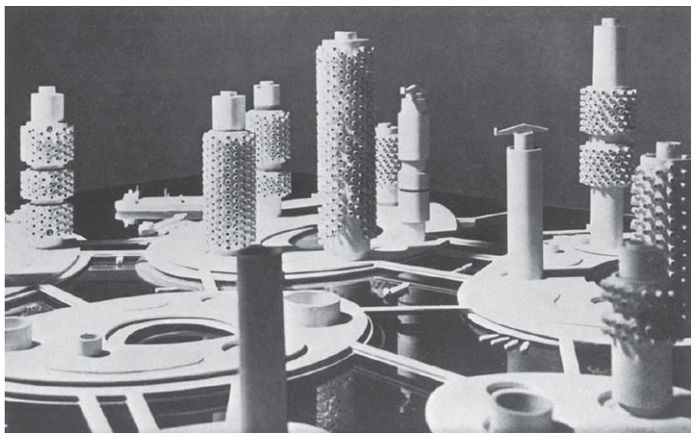
REYNER BANHAM's long-unavailable 1976 book has been reprinted, with an incisive new foreword by Banham historian Todd Gannon. It is especially welcome at a moment when the urban-planning and utopian projects of the late 1960s and '70s are increasingly under critical review, assessed as monumental failures subject to demolition or as aesthetic exemplars of their age demanding preservation. A brilliant historical survey, conducted during the height of the short-lived movement and by a central player in the western architectural world of the time, the text provides insight into the aims behind what was called the "megastructural" movement, and useful categorizations of its different manifestations. First defined by the Japanese Metabolist Fumihiko Maki, in 1964, following the spate of projects for rebuilding that emerged from Kenzo Tange's Tokyo office in 1960, the concept of megastructure as "a large frame in which all the functions of a city or part of a city are housed" soon took hold. It was a way for architects to respond to the demands of infrastructure, monumental form, and mass production integrated at a scale that went beyond the Modern Movement's urban-zoning principles, to create buildings that were miniature cities and city developments conceived as single buildings.



Banham traces the origin of the concept to Le Corbusier's drawings for the unbuilt Fort L'Empereur, Algiers (1931): "the massive sub-structures of an elevated super-highway, built like a gigantic bookcase of reinforced concrete on the shelves of which the inhabitants have built two-story houses to suit their own tastes," as Banham describes it. Postwar megastructures took their cue from a wealth of earlier precedents—vernacular (the pueblo of Mesa Verde) and Modernist (the Futurist designs of Antonio Sant'Elia)—utilizing hi-tech vocabularies (such as Archigram's) and "Brutalist" reinforced-concrete structures (Paul Rudolph's Lower Manhattan Expressway project).

Banham, himself an enthusiast of technological utopianism as found in the industrial structures of oil refineries and Cape Canaveral, had been an avid chronicler of the trend from the outset, and offers an inside





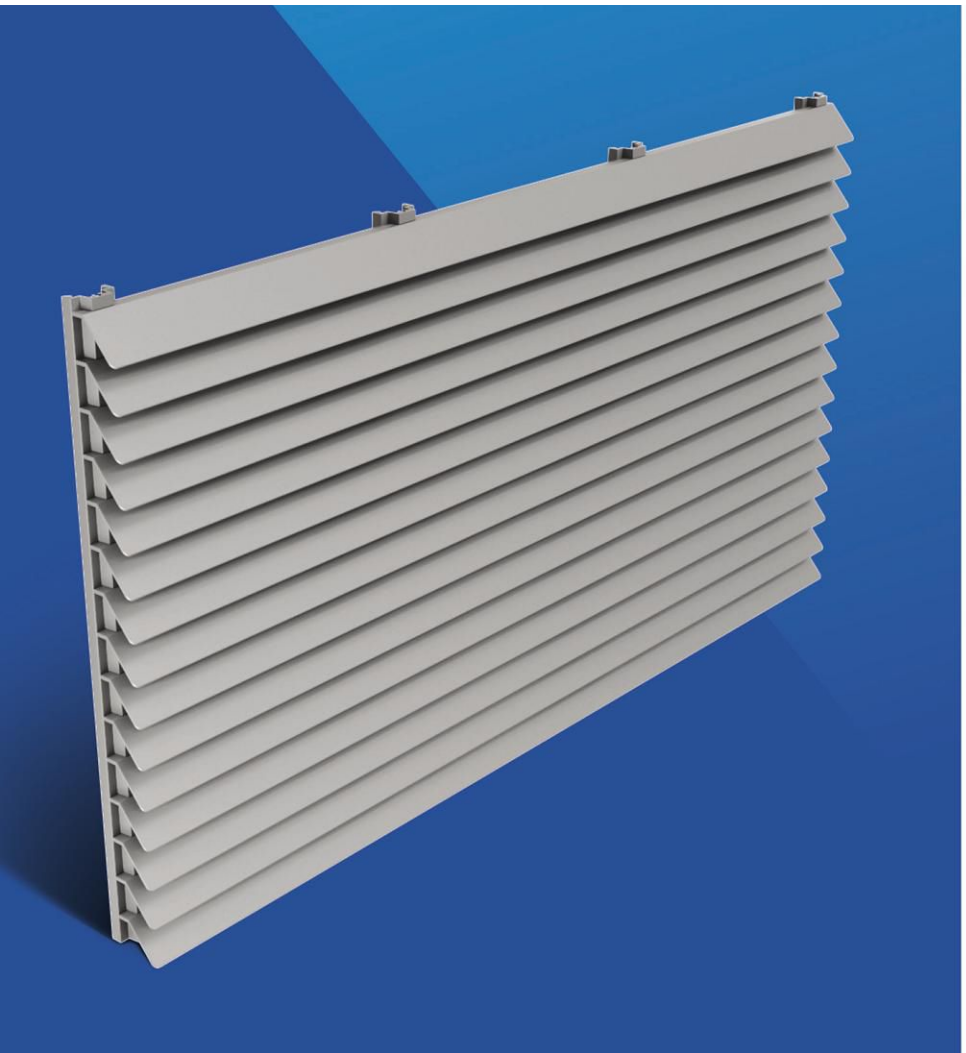
Kiyonori Kikutake's Marine City (1958)

look at the academic, idealist planning and construction of the genre from its utopian phase—Louis Kahn's City Hall (1958), Paolo Soleri's Mesa City project (1959), Yona Friedman's "Spatial Urbanism" (1960)—to the realized projects that followed: Candilis, Josic, and Woods's Free University of Berlin (1963), Owen Luder's Tricorn Centre, Portsmouth (1966), Moshe Safdie's Habitat and Ray Affleck's Place Bonaventure in Montreal (both 1967), and culminating in what for Banham represented both the triumph and the end of the megastructural experiment, Piano and Rogers's Centre Pompidou, Paris (1977).

In an echo of his earlier book summing up the Brutalist phase of postwar architecture, Banham's account reads now like an elegy for failure. Even as the "New Brutalism" started as a promising ethic of "as found" materials under postwar privation but had ended as an aesthetic style, so megastructures—which had begun as an attempt by architects to develop a new physical paradigm for an egalitarian social order—were inevitably subject to the political and economic forces of emerging neocapitalist development. While those megastructural housing and new-town projects that were built under socialist governments in postwar Europe were successful in providing high-quality environments for their populations, those types of buildings were unable to survive Thatcherite privatization in Britain and neoliberal development in Western Europe. Center-city megastructural reconstruction in the U.S. was, in turn, bound to serve business and consumer clientele under the rubric of "slum clearance." Architecture—whether ethical or aesthetic, in Banham's terms—was unable to offer resistance to the political economies of increasingly globalized monopolies. ■

Anthony Vidler is professor at and former dean of the Irwin S. Chanin School of Architecture, Cooper Union, and a historian and critic of modern and contemporary architecture.

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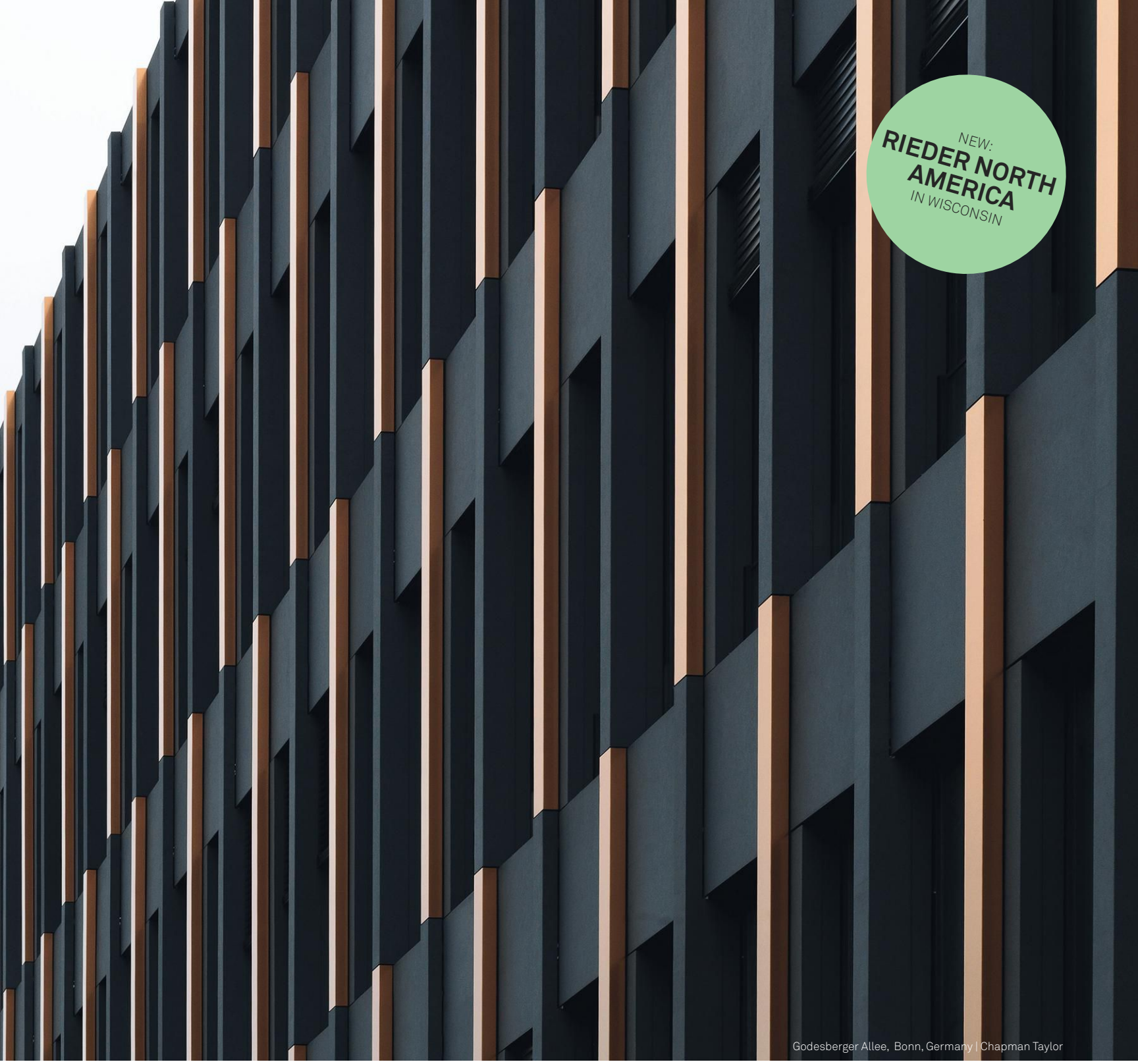


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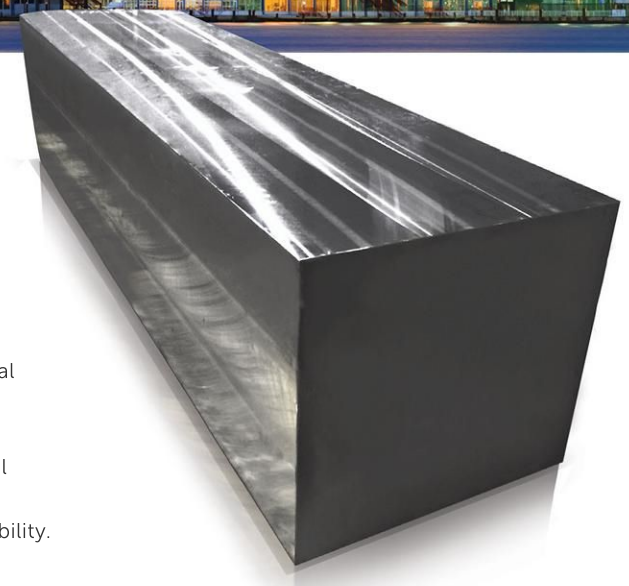
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The Way They Sway

A Cliff Dweller's Guide to Supertall Skinny Buildings

BY SARA HART

WHAT CAUSES billionaires to get dizzy in supertall and megatall towers? Is it the price tag or the side effect of dwelling so far off the ground? Is the public smirking about the correlation between price and altitude? Here is a deep backgrounder for those architects, urbanists, and the concerned public who wonder about the up and down sides of this race to the top of the world.

Historically, skyscrapers have been mostly commercial buildings, where companies lease space and build it out for their needs. But in the past decade, residential towers have started to rise to staggering heights in Midtown Manhattan and other parts of the city—and the globe—but with repercussions. *The New York Times* recently reported big problems and angry rich people at 432 Park Avenue, designed by Rafael Viñoly Architects and currently the tallest occupied residential building in the western hemisphere, according to the developers. Residents there have complained of mechanical malfunctions and acoustical discomfort—creaking walls, whistling sounds—as well as swaying and even stalled elevators, all because of the wind.

Dampers are not required by code (although 432 has two) but are considered essential: supertall towers can sway as much 3 feet in on each side.





432 Park Avenue, in New York (above), designed by Rafael Viñoly Architects, opened in late 2015; 111 West 57th Street, by SHoP Architects (right), is nearing completion.

When the late Leslie Robertson, the structural engineer for Minoru Yamasaki's 1,368-foot-tall World Trade Center (1973), found out that sway caused motion sickness for occupants of tall buildings, he and his team installed viscoelastic dampers between columns and floor trusses. These dampers reduce unwanted vibrations by converting kinetic energy into heat. (Hat trusses on top of each twin tower promised stiffness.)

Now dampers have become an invisible amenity, after wine cellars and dog showers, as potential buyers begin to seek assurances that their lofty perches will not sway in the wind. While that problem can be reduced, the publicity has increased awareness of the drawbacks of living high on the hog.

So why aim for the stratosphere? The short answer: Profit. The longer answer: continued profit. In recent decades, the evolving economics of building tall began to influence real-estate, financing, regulatory, and planning decisions. Scarcity of large plots and escalating land prices forced developers to recalculate their business models. The logic is straightforward: buildable lots are fewer, smaller, and more expensive. To be profitable, developers have to sell units at an exorbitant price per square foot, which isn't appealing to commercial tenants, who lease rather than buy. But ownership is supposedly an investment for wealthy buyers. And having a $100 million penthouse in a supertall with a view of everywhere has a cachet only money can buy. Helpful to business is certifiable height.

The Council on Tall Buildings and Urban Habitat (CTBUH), founded in 1969, developed international standards for measuring tall buildings and is recognized as the arbiter for bestowing such titles as the "World's Tallest Building." For the CTBUH, "supertall" is defined as 300 meters high (almost 1,000 feet) or more, while "megatall" rises about 600 meters (almost 2,000 feet).

Aggressive advancement in the fields of materials science and engineering have offered developers new opportunities to reach higher. The strength of steel and concrete has increased dramatically, which means, for example, that the thickness of concrete walls can be reduced. This new era of extreme height and thinness so far has been applied mostly to residential rather

PHOTOGRAPHY: © BRUCE BECK/ALAMY STOCK PHOTO (LEFT); LESTER ALI (RIGHT)



A Central Park view is a reason to live high in SHoP Architects' 111 West 57th, in New York.

PHOTOGRAPHY: © ARCHITECTURAL RECORD

than commercial towers, at least in the United States, although countries in the Middle East and Far East are betting on extravagant mixed-use towers.

While developers' fixations on height supremacy still dominate, they are now incorporating the slender quotient, known as the Aspect Ratio Challenge. Simply put, the slenderness of a tall building is the quotient of its width to its height. Structural engineers generally consider a skyscraper to be slender if the ratio exceeds 1 to 10 or 1 to 12.

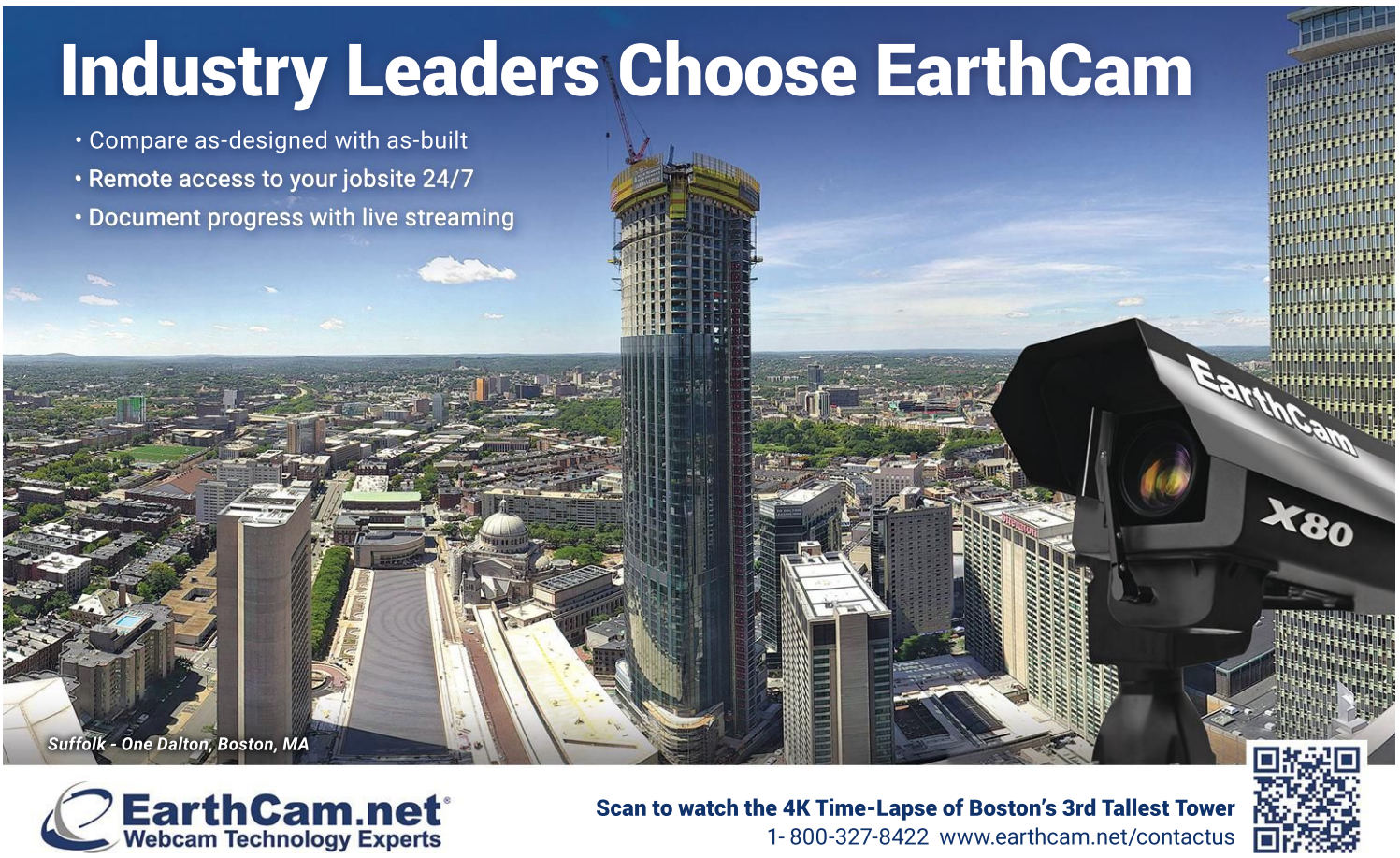
But you can never be too rich or too thin. The residential tower at 111 West 57 Street in New York, enabled by the developer's purchase of the air rights from the landmark Steinway Hall (designed in 1925 by Warren & Wetmore) will have a width-to-height ratio of 1 to 24. Surpassing the previous tallest residential tower, 432 Park Avenue, which has a ratio of 1 to 15, it will be one of the highest in the U.S. and also the thinnest skyscraper in the world. Conceived by New York-based SHoP Architects, the tower's northern elevation rises directly up to the pinnacle. But the southern elevation "feathers" its setbacks as the tower rises, shrinking the tower's footprint on higher floors. Because of the stepped profile of the pinnacle, 111 West 57th Street is nicknamed "Stairway to Heaven."

The engineering firm WSP, a global leader in delivering super-slender towers, has worked on many of the new generation, including SOM's One World Trade Center (2014), 432 Park Avenue (2015), as well as the soon-to-be-completed 111 West 57th Street. Obviously, a stiff and strong structure is needed to endure wind and seismic forces.

By designing two shear walls on the east and west elevations, WSP has achieved the necessary stiffness, while allowing clear views to Central Park on the north and lower Manhattan to the south. The tuned mass damper is located above the highest occupiable floor of the concrete structure and below the lighter steel cage that supports the tower's classic Manhattan finial.

Will the goal of megatowers still be "the sky's the limit" after the Covid pandemic shut down the planet? CTBUH reports a 20 percent decline in 2020 for buildings 200 meters and taller. And yet, optimism (or ambition) does not appear to be dampened. In the end, limitations will come from issues regarding livability. What are the political, social, and economic ramifications of having it all or having only a small piece of it? Is anyone thinking about it? ■

Sara Hart, trained as an architect, is a former RECORD *editor who writes about architecture.*





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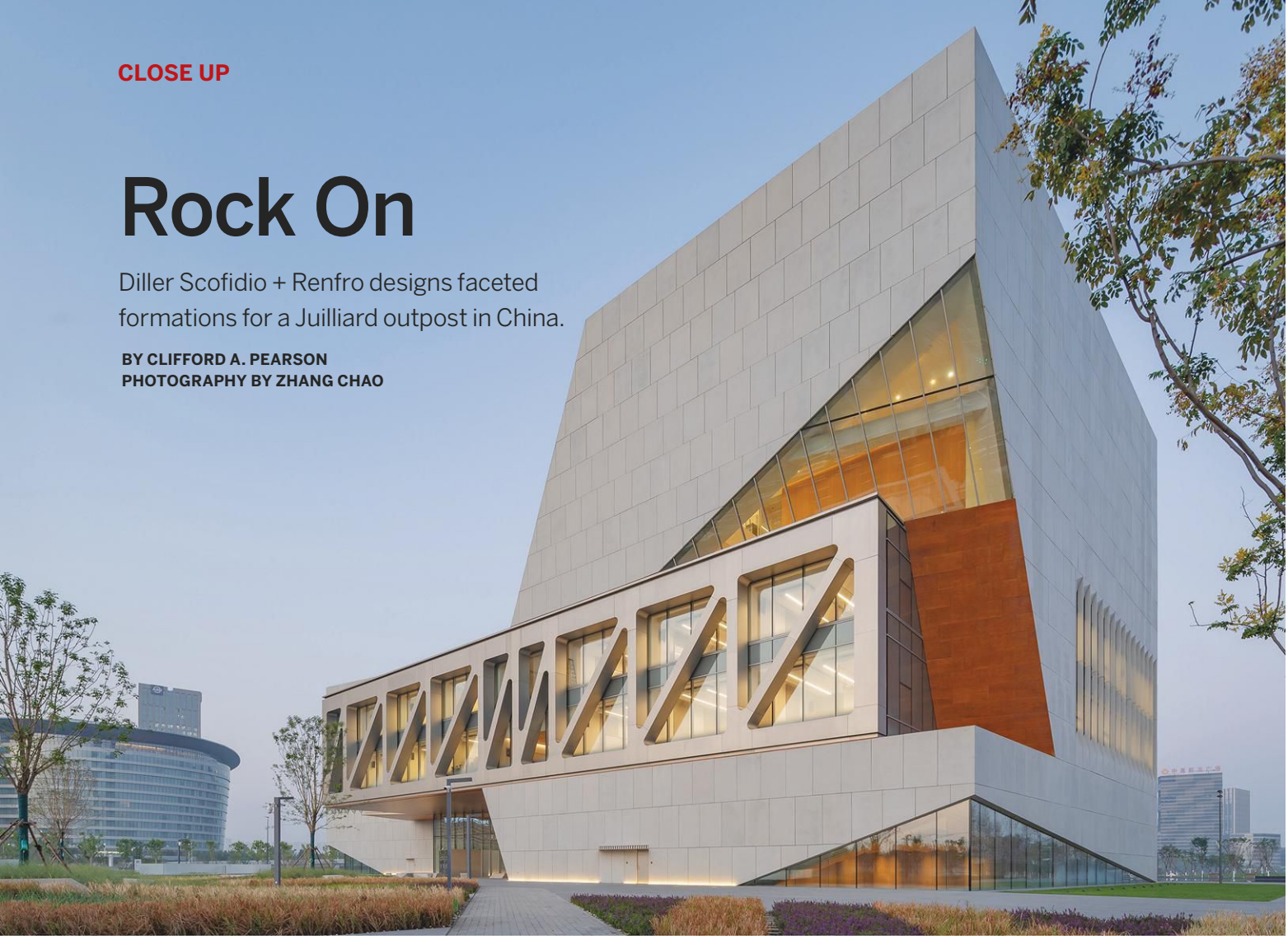
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Rock On

Diller Scofidio + Renfro designs faceted formations for a Juilliard outpost in China.

BY CLIFFORD A. PEARSON
PHOTOGRAPHY BY ZHANG CHAO



A MEGASTRUCTURE set in a megalopolis, Tianjin Juilliard aims to be both big and agile. It's a campus in a building, a descendent of the energetic, multipurpose contraptions dreamed up by Cedric Price and Archigram six decades ago in Swinging London. "Our practice has always been influenced by the great thinkers of the '60s and '70s," says Charles Renfro, the DS+R partner in charge of the Tianjin project. "We certainly thought about Price's Fun Palace and how you can create a place where lots of different things can happen, both programmed and unprogrammed." But while many of the supersized structures from that era turned their backs on their surroundings, Tianjin Juilliard tries to establish a close relationship between building and context.

The 350,000-square-foot complex sits in a riverside park in the rapidly growing Yujiapu Financial District of Tianjin, a port city 85 miles southeast of Beijing that has been the focus of intense development over the past 20 years. High-speed trains now connect the capital's 21 million residents to Tianjin's 15 million people in just 45 minutes, creating a vast sprawl of urbanization.



To break down the bulk of the Juilliard building, DS+R carved it into four pavilions, each articulated with its own faceted form and each looking out in a different direction. Three of the pavilions contain major performance spaces—a 690-seat concert hall, a 299-seat recital hall, and a 225-seat black-box theater—while the fourth houses rehearsal studios, offices, and a library. A large skylit lobby ties all of the pieces together and reaches out to the park with six entrances. Open to the public, the lobby acts as a civic space and an extension of the park, says Renfro.

A critical aspect of DS+R's design strategy was submerging each of the performance spaces one level below grade. This allowed all



Steel-truss bridges, visible on the exterior of the building's pavilions (opposite), create a dynamic lobby (top). Below grade is an "Imagination" space that connects to Juilliard in New York (above).

of the back-of-house areas to be underground as well, so the ground floor is uninterrupted and flows from park to lobby and back out to the park. The architects tipped up the corners of each pavilion and wrapped the ground floor with glazing, letting passersby look into the various music halls and the lobby. DS+R did much the same with its renovation and extension of Juilliard's home in New York, transforming Pietro Belluschi's 1960s Brutalist building into a more open structure, connected to the rest of Lincoln Center and the streets around it. "We wanted to take that DNA of transparency and openness and implant it in Tianjin," says Joseph Polisi, who worked with DS+R on the Manhattan project when he was president of the performing arts school: he now serves as its chief China officer.

Crisscrossing the lobby and knitting the pavilions together on upper levels is a series of five steel-truss bridges glazed on two sides. Classrooms, teaching studios, and practice rooms line these bridges, presenting their activities to people in the lobby and the park. Triple-glazed IGU's, in combination with double walls between practice rooms, prevent





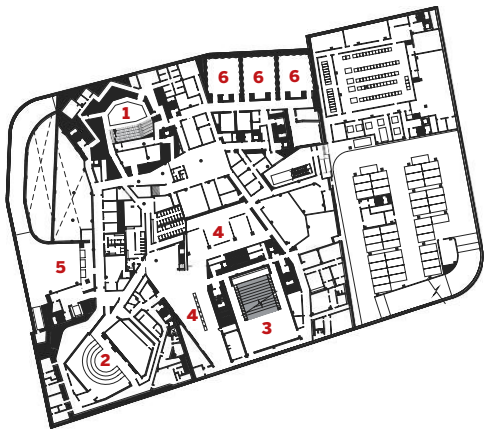
Performance spaces, including the concert hall (top) and a rehearsal room (above) are clad in wood.

sound from escaping and creating a cacophony of competing music. At the end of each bridge is a double-height student lounge with views to the park and the surrounding areas. "We wanted circulation spaces to be vibrant and have architectural significance," says Renfro.

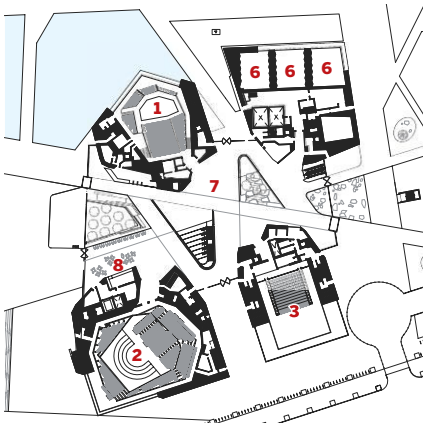
An "Imagination Space" below grade is equipped with screens and sophisticated technologies that connect it to Juilliard in New York, showing live and recorded performances. While the lower level and ground floor are open to the public, students and staff pass through security to get to upper floors.

On the outside of the building, DS+R specified glass-fiber-reinforced-concrete panels that have been sandblasted to reveal dark aggregate and give the impression of stone. The firm sculpted each pavilion, so together they appear as a collection of buildings. A public outdoor stair snakes up the volume with the concert hall, taking people to terraces on top of the zigzagging bridges. Inside the concert and recital halls, DS+R used wood panels to give resonance to the sound and applied much of the knowledge it had acquired from its work at Lincoln Center a decade ago to make the music sound its best.

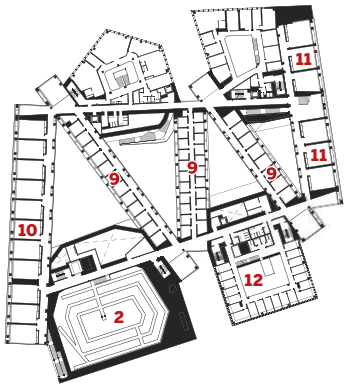
Tianjin Juilliard is the first performing arts institution in China to offer a U.S.-accredited Master of Music degree, and is Juilliard's only satellite campus. It opened last September and, like most schools in China, is operating with in-person classes and performances. "We've long been an international institution, with about 30 percent of our students coming from outside the U.S.," says Polisi. "Now we are a global one." ■



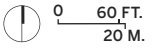
BASEMENT LEVEL-ONE PLAN



FIRST-FLOOR PLAN



THIRD-FLOOR PLAN



1 RECITAL HALL
2 CONCERT HALL
3 BLACK-BOX THEATER
4 IMAGINATION SPACE
5 LOADING DOCK
6 REHEARSAL STUDIO
7 LOBBY
8 CAFÉ
9 PRACTICE ROOMS
10 TEACHING STUDIOS
11 CLASSROOMS
12 FACULTY LOUNGE



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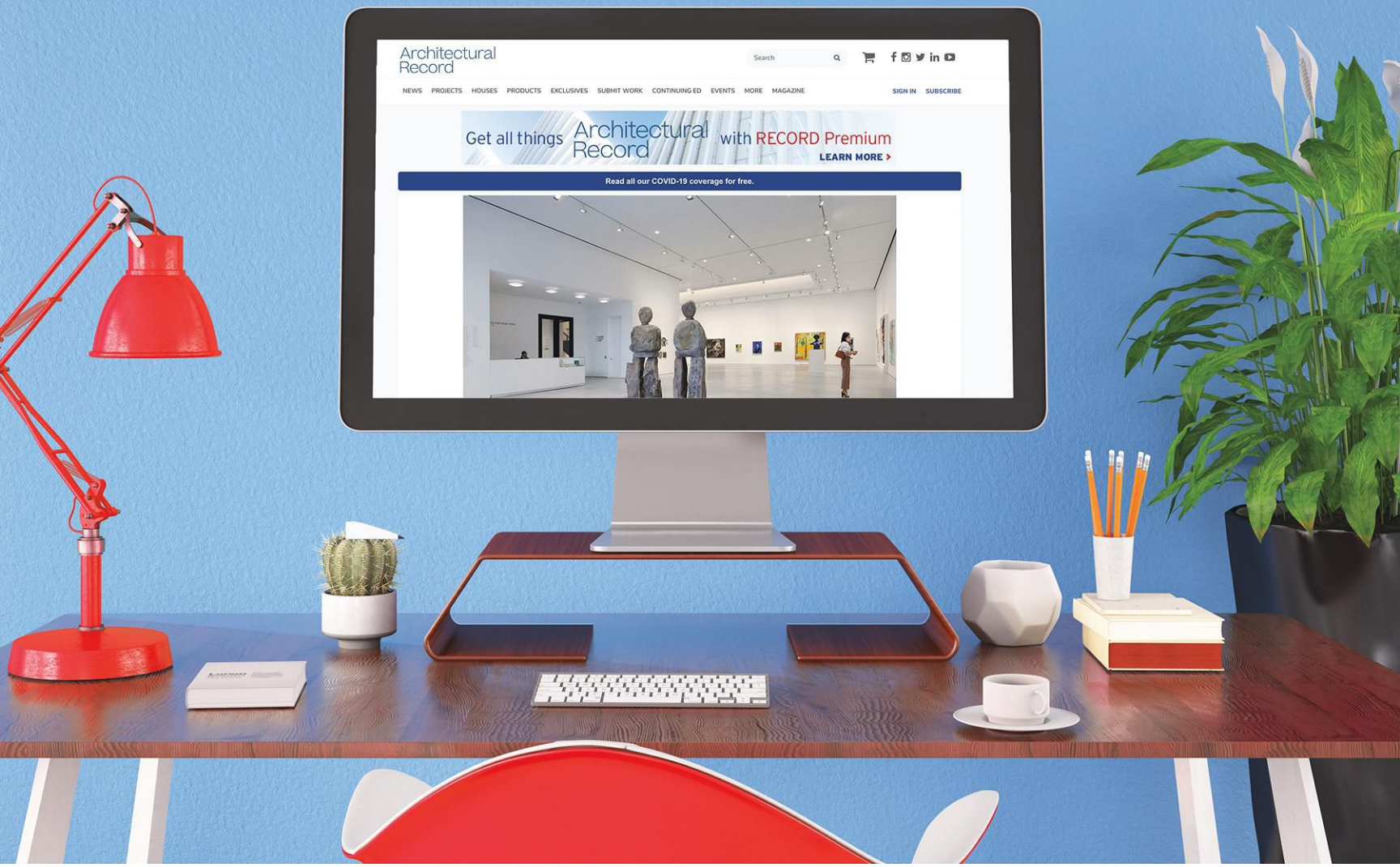
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Fast Forward

In Rwanda, MASS Design Group tailors an ambitious building to train tomorrow's leaders.

BY ALEX KLIMOSKI
PHOTOGRAPHY BY IWAN BAAN

IN THE RWANDAN capital city of Kigali, the new African Leadership University (ALU) campus, designed by Boston-based MASS Design Group, looks boldly to the future. The handsome 70,000-square-foot pale tan brick building, one of the firm's largest education projects to date, cascades down a steep hillside—a roughly 130-foot drop in elevation—connecting outdoor plazas and passageways in a dynamic grid structure. It is a physical manifestation, says MASS founding principal Michael Murphy, of a pioneering pedagogy with one driving goal: to transform Africa by cultivating its next generation of leaders.

The university expands on the mission of the African Leadership Academy (ALA), a competitive residential high school located on the outskirts of Johannesburg, cofounded in 2004 by the Ghanaian entrepreneur Fred Swaniker. In 2015, Swaniker launched ALU's first campus, in Mauritius, to meet the growing demand, at the college level, for the type of intensive, hands-on training provided by ALA. Together these institutions bring together young people from across Africa, grooming them to develop the





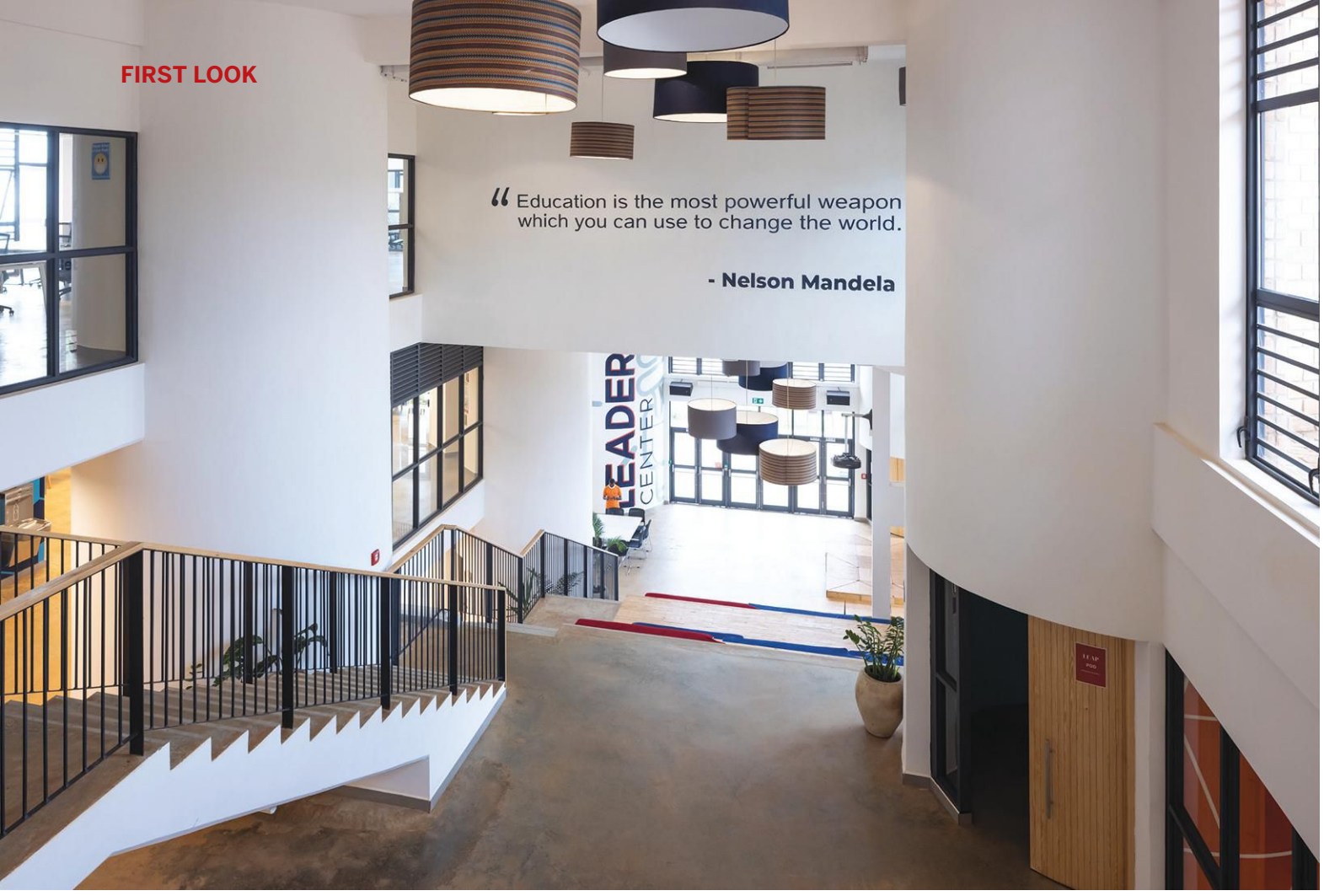


innovative professional and ethical governance skills needed to tackle the most pressing challenges facing the continent—which, with the fastest-growing population in the world, is projected to have a greater workforce than China by 2030. Swaniker engaged MASS in 2017 to submit a proposal for the second ALU campus, to be in Kigali Innovation City, a new special zone in the Gasabo District comprising schools and biotech and technology companies.

MASS—which has an office in Kigali and has planned, designed, and built nearly two dozen locally sourced projects in Rwanda, including research centers, medical facilities, schools, and housing—worked closely with the ALU team to create a built environment that would uphold Swaniker's progressive vision. Unlike the paradigm of higher education in the United States, where sprawling, infrastructure-heavy campuses with large lecture halls are the norm, ALU's model is organized around more intimate classrooms and work spaces that support four phases of schooling: discovery, in which students identify what they need to learn; individual, self-paced instruction; peer learning; and facilitated group learning. According to Boston-based project architect Patricia Gruits, the design team participated in workshops, focus groups, and various exercises with faculty, staff, and students to "try to understand the nuance of what happens in each of these phases, and to figure out how the architecture could respond."

The hillside university offers a variety of spaces for study and meeting, inside and out.

The design team observed that most learning happens outside the classroom, and that small group settings are critical to maintaining the culture of innovation and entrepreneurial spirit that drives ALU's curriculum. These scenarios were translated into a spatial arrangement of modules and pods, which form the six-story building's structural grid. The modules, each defined by four open columns, constitute "work hives," with various seating arrangements; the pods—small rooms within the hollow round columns—accommodate both individual and peer learning.





Large circular columns define the interior (above), some containing seating areas (left).

These columns are a motif throughout the building, holding mechanical and electrical risers and elevators inside, as well as seating areas and planting spaces outside for a profusion of trees and greenery. The handsome brick walls include open-brickwork screens as part of the facade, to promote natural ventilation throughout the building.

Considering the site's dramatic change in elevation, the modules enabled the architects to conceive of the building—which has a structure of locally made stabilized earth blocks and reinforced concrete—as a system of smaller components that stack and interlock, creating a complex network of tiers and terraces, with numerous outdoor gathering and work spaces. That design also allows for flexibility. “ALU is expanding so quickly,” says Gruits, “it needed a building that could grow to meet demand and give it the ability to adapt and evolve.”

According to Murphy, the building's program is a prototype not just for ALU—which has ambitious plans to build more than two dozen medium-size universities across Africa within the next 15 years—but also for countries around the world, including the United States. “The education paradigm in the U.S. cannot be replicated in the next generation—there needs to be a new standard,” says the architect. Ideally, this framework would embrace remote learning—not in the vein of the current ad hoc Zoom model, but “designed around a much more regimented online structure.” In this way, the pandemic has revealed ALU's great foresight, Murphy says. “I would call it a post-Covid pedagogy that's already built.” ■

Alex Klimoski is a New York–based writer and editor focused on architecture and design.

Mitsubishi Electric Elevators & Escalators



PHOTO COURTESY OF GIARRATANA LLC

Bringing Nashville residents to new heights

Nashville has many claims to fame — country music, hot chicken and the Grand Ole Opry, to name a few — and its skyline may soon join the list. Alcove and Prime, a pair of 34- and 38-story upscale apartment towers, will be among the tallest structures in bustling Music City, U.S.A. upon their completion in late 2023 and 2024, respectively. Collectively the towers will cover nearly an acre of prime real estate along Church Street in the bustling downtown, directly across from the up-and-coming Nashville Yards district.

Local developer Giarratana LLC and Chicago-based architect Goettsch Partners intend for Alcove and Prime to provide premier apartment living to an influx of new residents drawn to Nashville by one of the country's hottest job markets. But what sets the Giarratana projects apart from other nearby residential options? The towers provide *vertical* living, which appeals to residents with easy access to amenities, services and sweeping views of the vibrant downtown. As Nashville grows and downtown becomes more populated, vertical living helps preserve and enhance the city's quality of life.

Safe, reliable and high-quality vertical transportation is essential for the project's success. The towers will use Mitsubishi Electric elevators, built by AECOM Hunt and equipped with an innovative Sigma AI 2200 Destination Oriented Allocation System (DOAS®) compatible with Mitsubishi Electric's touch-free smartphone call system. These features, combined with Mitsubishi Electric's sophisticated engineering, energy-efficient motors and quality materials, will enable passengers to move safely and seamlessly — from the ground floor to the penthouse. Visit mitsubishielevator.com or email EEDSales@meus.mea.com to experience *Quality in Motion*® for yourself.

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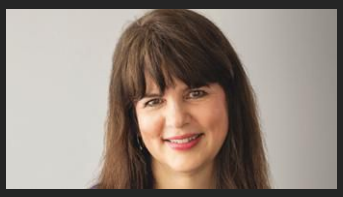
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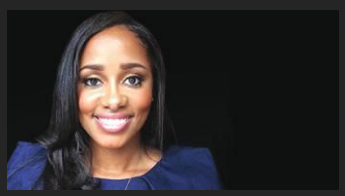
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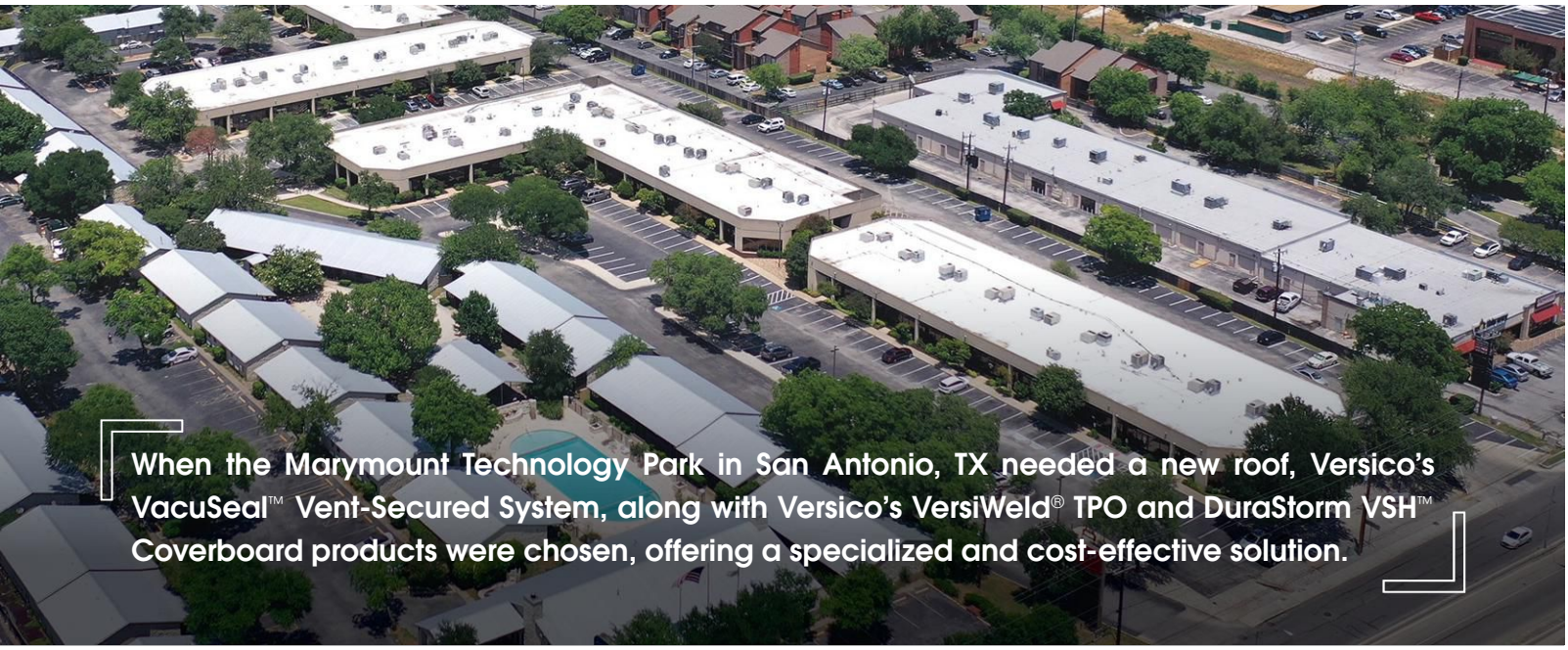
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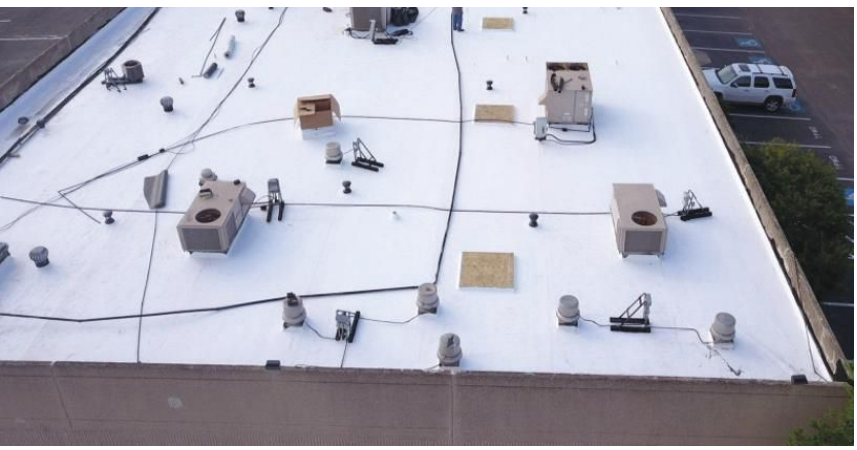
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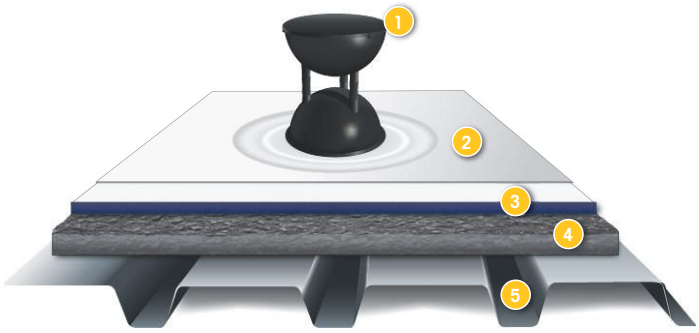
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TALL BUILDINGS

Believe it or not, there is no universally accepted definition of a tall building. The experts don't agree on a minimum height to qualify. On the following pages, RECORD has embraced this ambiguity with projects that include a 36-story residential building in St. Louis with a fan-like facade as well as a 1,148-foot-tall office tower in Shenzhen, China, and its muscular bracing system. But, despite the range, all the buildings share an interest in inventive form, ingenuity in structure, and engagement of context. Reading about them and taking the online quiz earns one hour of continuing-education credit (see page 99).

PHOTOGRAPHY: © EMA PETER

VANCOUVER HOUSE, BRITISH COLUMBIA
BJARKE INGELS GROUP

Vancouverism

In the western Canadian city, BIG reinterprets the typical residential tower.

BY KATHARINE LOGAN
PHOTOGRAPHY BY EMA PETER

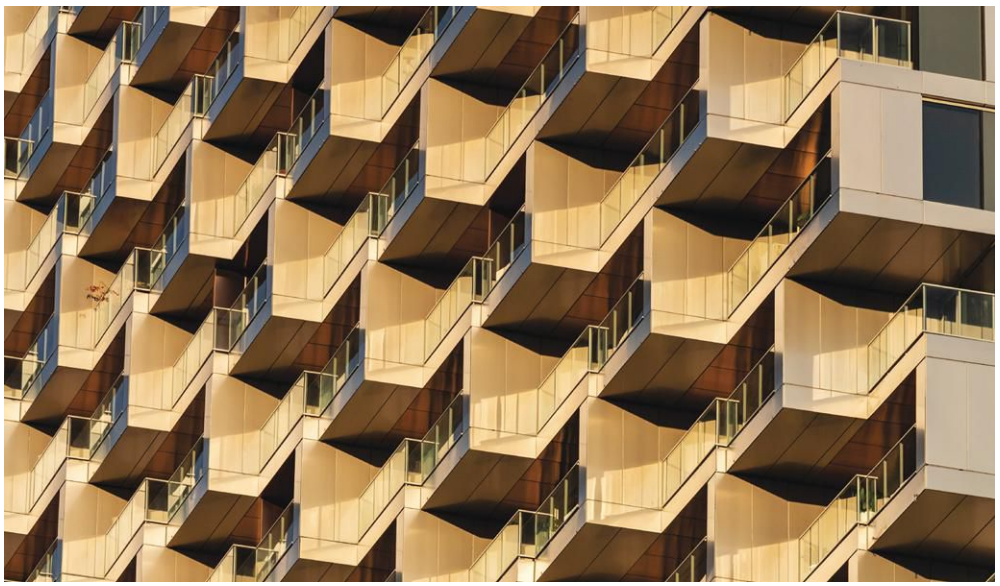
DOWNTOWN Vancouver's location on a small peninsula on the Pacific coast comes with all-natural non-negotiable boundaries to urban growth. Combined with the public priorities of view corridors to the North Shore Mountains and a pedestrian scale at street level, these constraints have given rise to a distinctive form of urbanism. "Vancouverism" (an internationally recognized term in planning circles) refers both to the integration of dense mixed-use development with accessible natural amenities and to the city's characteristic building type: the point tower on a retail or townhouse podium.

Highly successful as a model for urban livability, the typology from an architectural perspective is now arguably formulaic. Vancouver House—a 515-foot, 53-story mixed-use development designed by Bjarke Ingels Group (BIG) and completed in 2020 (it sold out in 2014)—reinterprets the tower on a podium in response to a uniquely challenging site. "We thought maybe there was a way to inject new life into the building type," says Bjarke Ingels, "for the tower to escape the typology of the extruded universal plan in favor of one that reproportions as it grows."

Located at the foot of the eight-lane Granville Street Bridge, one of three main gateways to the city center, the site is trisected by the fork of the bridge's elevated ramps. A mandatory 98-foot setback from the traffic pares even the largest parcel down to a triangular footprint that's too small for the money to work. "Those difficult places are really the ones that have the greatest potential to force creativity and invention," says Ingels. In a solution negotiated with the city, the design interprets the setback requirement not straight-up, but as a radius. As the stainless-steel-and-glass-clad tower clears the redefined setback, pixel-like units begin corbeling from the hypotenuse of the triangle until the plan becomes orthogonal, doubling the floor area of the upper levels.

From some vantage points, the resulting form presents as a slender rectangle, from others as a curtain drawing aside to open the way out of the city, and from others, suggests Ingels, "it looks almost like a genie coming out of a bottle."

A genie, however, is not inherently structur-





THE APPROACHES to Granville Street Bridge cut through the Vancouver House site (right). The tower's incremental setbacks give the east facade (above) a pixilated appearance.

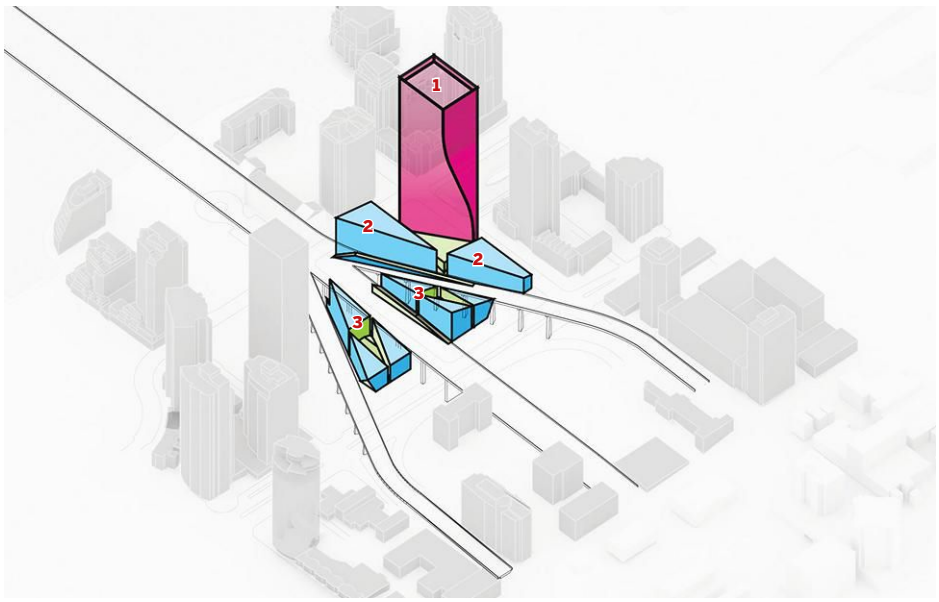




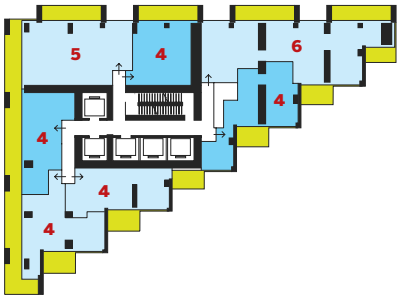
ally stable. "The overturning due to self-weight is as much as that from an earthquake, and Vancouver is prone to large ones," says Derrick Roorda, a principal in the San Francisco office of Buro Happold, structural engineer for the project with Vancouver-based Glotman Simpson. Post-tensioned high-strength steel cables inside the 2- to 3-foot-thick walls of the reinforced-concrete building's core hold down the side opposite to the cantilever. They also keep the concrete under compression, preventing it from cracking, and thus significantly reducing the walls' potential to deflect.

Each facade of the tower is different: the north and east because of the incremental cantilever, and the south and west in response to solar conditions. South-facing loggias and west-facing balconies are boxed with thick frames for shade and privacy; and where the facade elements of neighboring towers are mostly light and delicate, the scale of Vancouver House's facade pattern holds up to that of the bridge and its steel-truss substructure and constant flow of traffic. In fact, the proportions of solid and void in the building's elevations resemble those in some of the struts helping to keep the roadway aloft.

The tower's distinctive silhouette and prominent site have made it the focus of public attention, but the project's great sur-



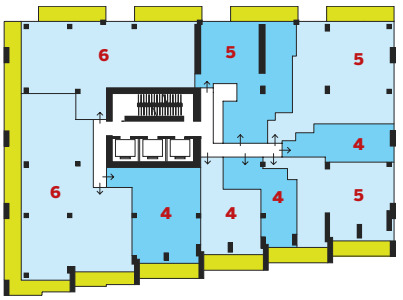
SITE DIAGRAM



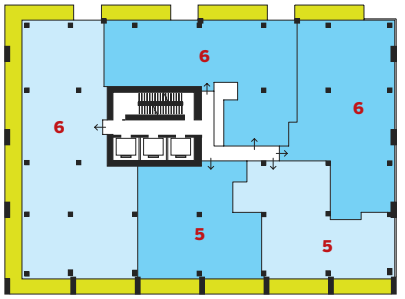
15TH-FLOOR TOWER PLAN



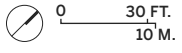
28TH-FLOOR TOWER PLAN



42ND-FLOOR TOWER PLAN



53RD-FLOOR TOWER PLAN



1 CONDOMINIUM TOWER
2 RENTAL HOUSING
3 COMMERCIAL SPACE
4 ONE-BEDROOM APARTMENT
5 TWO-BEDROOM APARTMENT
6 THREE-BEDROOM APARTMENT

THE LOBBY includes copper-clad walls (above). The material is echoed in the kitchen backsplashes and the copper-toned balcony soffits (right). The kitchen island resembles the tower's profile, but turned 90 degrees. A spinning chandelier by local artist Rodney Graham activates the space under the elevated roadway (opposite).





The Grove at Grand Bay, Miami



The XI, New York



Telus Sky, Calgary

With a Twist?

RECORD *asked BIG's Bjarke Ingels how Vancouver House relates to the firm's other towers, such as Telus Sky in Calgary, the fraternal-twin towers of the Grove at Grand Bay in Miami, and the dancing pair at The XI in New York, which all appear to twist as they rise.*

Bjarke Ingels: First of all, neither Vancouver House nor **Telus Sky** is twisting, actually. I would say that the correct term for Vancouver House would be expanding—expanding from a triangular floor plan to a rectangle, which gives rise to the illusion or perception that the tower is twisting.

Similarly, or almost inversely, Telus Sky has a different prerequisite, in that the bottom half of the tower is work spaces. For work space, you want a floor plate that is as large as possible, but once the program transitions to living space, you want a shallower floor depth. So the tower has to become more slender. In neither case is there an actual twist.

In the **Grove**, there is an actual twist going on. The pair of towers are facing front and back on the lower levels, and then they turn as they rise to become side by side on the higher levels, reorienting the apartments toward the more desirable views of downtown Miami and the bay.

Lastly, in New York, the two towers of **The XI** are reproportioning. On the lower levels, where you are surrounded by the urban context of Chelsea and the Meatpacking District, the river-facing tower is opening up a framed view toward the river for the High Line tower. And then, once they clear the rooftops of the neighboring warehouses, they change in proportion so that the river-facing tower takes up the entire elevation of the Hudson River, and the High Line–facing tower expands, with large north-facing and south-facing elevations looking uptown and downtown.

What unites all four projects is that they reject the more typical approach in which you choose a single floor plan that you repeat infinitely—or until you're done with the building. In all four cases we realize that, as you rise up through the city, the demands, the requirements, the concerns, and the considerations for the context and for the neighbors—access to daylight, capturing views, etcetera—change. That means that the best or the right answer at the ground floor may be very different from the best or the right answer in the middle or at the top. That's why you get these vertical buildings that change, or shift, or grow, or turn as they rise.

PHOTOGRAPHY: © RASMUS HJORTSHØJ (TOP); DBOX (BOTTOM, LEFT)

COURTYARDS, including one for the swimming pool, are carved out of the triangular podium buildings (right).

prise is the urban contribution made by the angular six-story "podium" buildings that are part of the complex. Three glassy prisms inserted between the tines of the bridge's fork comprise residential rental units, commercial space that has been leased to a private university, and street-level retail. Formally, the wedge-shaped buildings respond to the constraints of the raised roadway, the need to get light to the public spaces beneath it, the sloping topography, and the dense and intense urban context.

For the streets between the lower levels of these buildings, the bridge with its monumental concrete bents and piers forms a sheltering hypostyle. The buildings' upper levels create a street wall for the elevated ramps, domesticating them and defining a threshold to the downtown. Green roofs tilting toward the traffic offer a moment of refreshment for people driving past. Carved out of the buildings' cores, multilevel, wood-lined courtyards—accessible to occupants and, potentially, the public—provide sheltered outdoor space. Those courts, and the steps and paths that thread through them, introduce an almost European, village-scale experience, completing the project's span of scales from urban to intimate.

Ingels describes the solution for the tower as a hole in one, a simple meeting of requirements; the lower buildings, by contrast, represent most of the detailed design work. "Even though I knew that 80 percent of the effort had gone into this realm between the bridges," he says, "I was happily surprised at what a Euclidean, Piranesian, three-dimensional urban space it has actually become."■

Credits

ARCHITECT: Bjarke Ingels Group — Bjarke Ingels, Thomas Christoffersen, Beat Schenk, partners in charge; Agustín Pérez-Torres, project leader; Carl MacDonald, Melissa Bauld, project managers/designers

ARCHITECT OF RECORD: DIALOG

GENERAL CONTRACTOR: ICON West Construction

CONSULTANTS: Buro Happold (structure); Glotman Simpson (executive engineer); Nemetz & Associates (electrical); Integral Group (mechanical); Brook Vandalen Group (facades); Morrison Hershfield (envelope); PFS Studio (landscape); HLB Lighting Design (lighting); James KM Cheng Architects (urban design)

CLIENT: Westbank Projects

SIZE: 650,000 square feet

COST: $278 million

COMPLETION DATE: November 2020

Sources

CURTAIN WALL: Iljin, Glastech

SOLID SURFACING: Avonite

LIGHTING: iGuzzini, Artemide, Ocean Pacific, Lutron

ELEVATORS: TK Elevator, CEI







High Ambition

Morphosis's Hanking Center, in western Shenzhen, China, puts engineering ingenuity on display in this supertall structure.

BY SUZANNE STEPHENS
PHOTOGRAPHY BY ZHANG CHAO

ALTHOUGH Thom Mayne and his firm, Morphosis Architects, have designed several supertall buildings (towers more than 300 meters, or 984 feet high), Hanking Center is the first one to be constructed. The firm's earlier 985-foot-tall curvilinear Phare Tower, in Paris, of 2010, and its hotel tower for Vals, Switzerland (1,250 feet), designed in 2015, are both, so to speak, 6 feet under. So it's good to have the 1,148-foot-high Hanking Center office tower in the Nanshan district of west Shenzhen, China, actually realized and currently filling up with office tenants. The office has entered a competitive category where Mayne can nod nicely to KPF (which has four supertalls alone in Shenzhen) and other architects he encounters during invited interviews with prospective global clients.

In the U.S., the debate continues about the value of creating more supertall buildings, with some construction slowing during the pandemic and uncertainty about the amount of office space that will be needed in major cities in the future. But in other parts of the world, the skyscraper category is vibrant, especially in China, where seven of the 10 tallest buildings currently under construction are located. In addition, "the clients are adventurous," says Mayne. "The representative for Hanking Center said he loved the lyricism of the scheme, and he would protect us during the process."

Mayne claims, "We don't deal in style." It depends on what you call style. The building has all the muscular show of force characteristic of Morphosis's best work. The Hanking Center takes a brawny frame of steel and glass and adds an elegance to its silhouette, where the main tower is cleaved from the core. Morphosis designed a mega steel-braced frame structure for a tropical climate where typhoons and earthquakes pose challenges for tall buildings. In working out the design concept with Robert Halvorson Associates of Chicago, the structural engineer, the architects came up with a slender tower coupled with a detached core, in which elevators, services,



SKINNY IS IN with a vertically bifurcated steel structure that features a low-E double-glazed main tower and an aluminum-clad detached core (right). The entrance to the podium on the west (opposite) leads to a mix of activities.



THE GAP between the main tower and the detached core, viewed looking up from a skylight in the podium, shows the drama of the mega–frame bracing (above). The office lobby in the podium looks south over the city.

and mechanical functions are tucked. The engineers, of course, were essential: "We had that covered with Bob Halvorson," says Mayne.

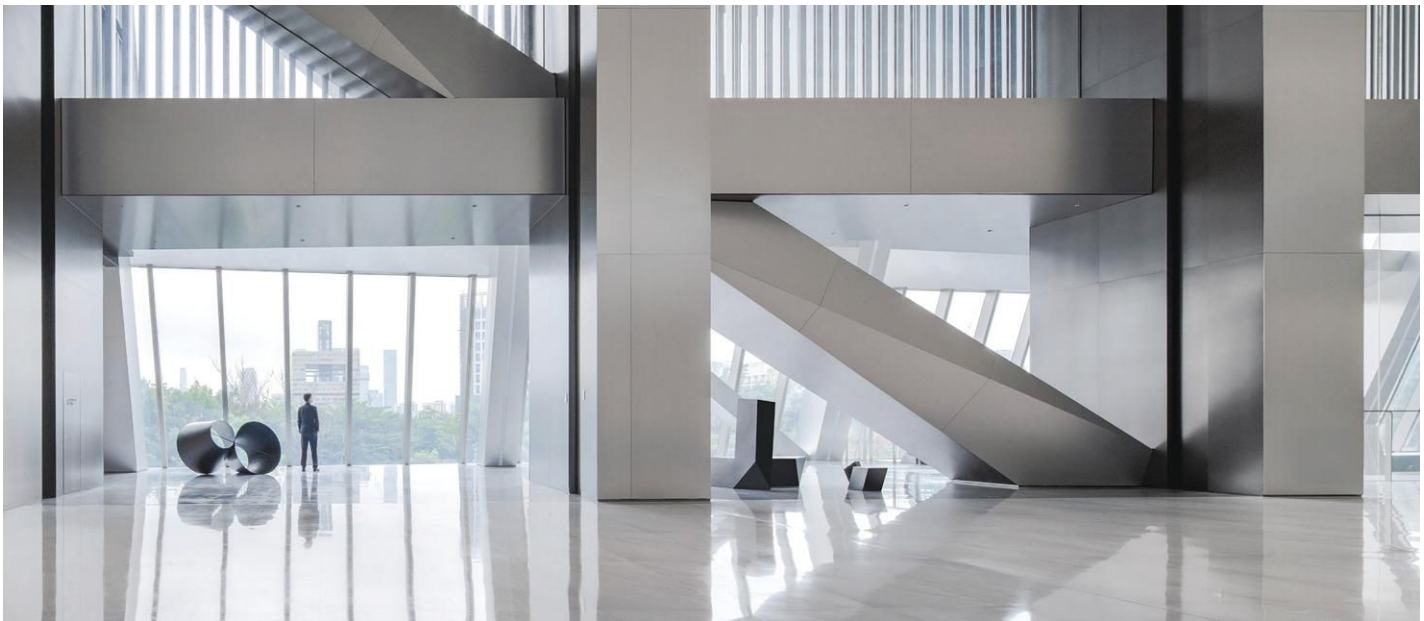
Having a core offset from a tower has a history: Skidmore, Owings & Merrill's Inland Steel building in Chicago of 1958, although only 332 feet high, moved the elevator core from the center of the floor to the perimeter, to provide a column-free space. Rogers Stirk Harbour did the same with the 738-foot-high Leadenhall Building in London of 2014. Hanking Center is not only taller but even farther detached, with a 35-foot gap between the main tower and its separate core, enabled by a mega brace-frame system that takes care of seismic and wind forces. In plan, Hanking's office floors are indented on the east and west. In elevation and in section, the main tower tapers as it ascends from larger to smaller floor plates (for boutique offices), while the detached core shoots up straight as a soldier's spine.

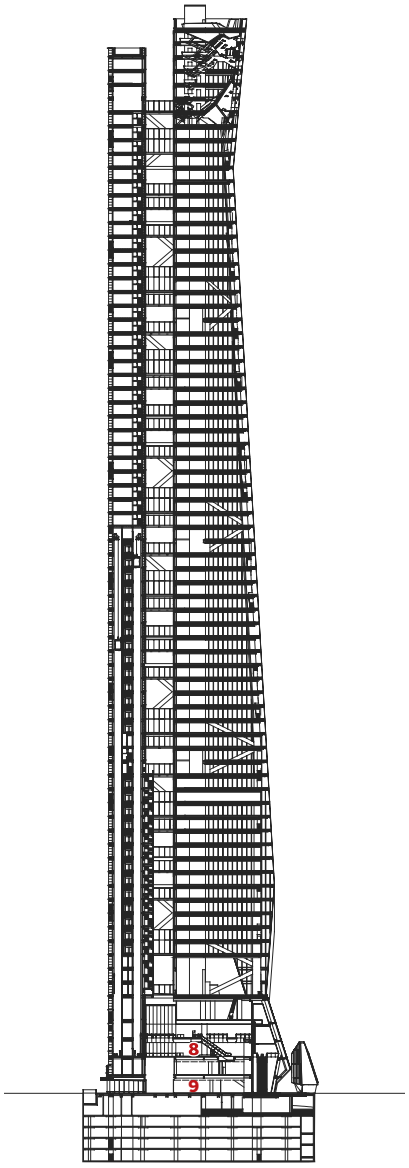
The floors all have 270-degree views east, west, and south; only the vista on the north, where the core connects to the tower, is obstructed. Two smaller, supplementary elevator cores, inserted on the north edge of the main tower, provide additional modes of circulation—which can be useful for the privacy of visiting VIPs.

The 60 floors of offices sit on top of a 1,796-square-foot plinth with four-stories above grade and one below, for shops and restaurants. Four additional levels underground contain parking and services. Three "refuge" floors are inserted in the upper tower for fire safety.

While Zhubo Design, the architect of record, had oversight on drawings and building codes, Morphosis's partner in charge of the project, Eui-Sung Yi, reports that "our firm did its own construction drawings"—highly unusual in China. The project took time: design

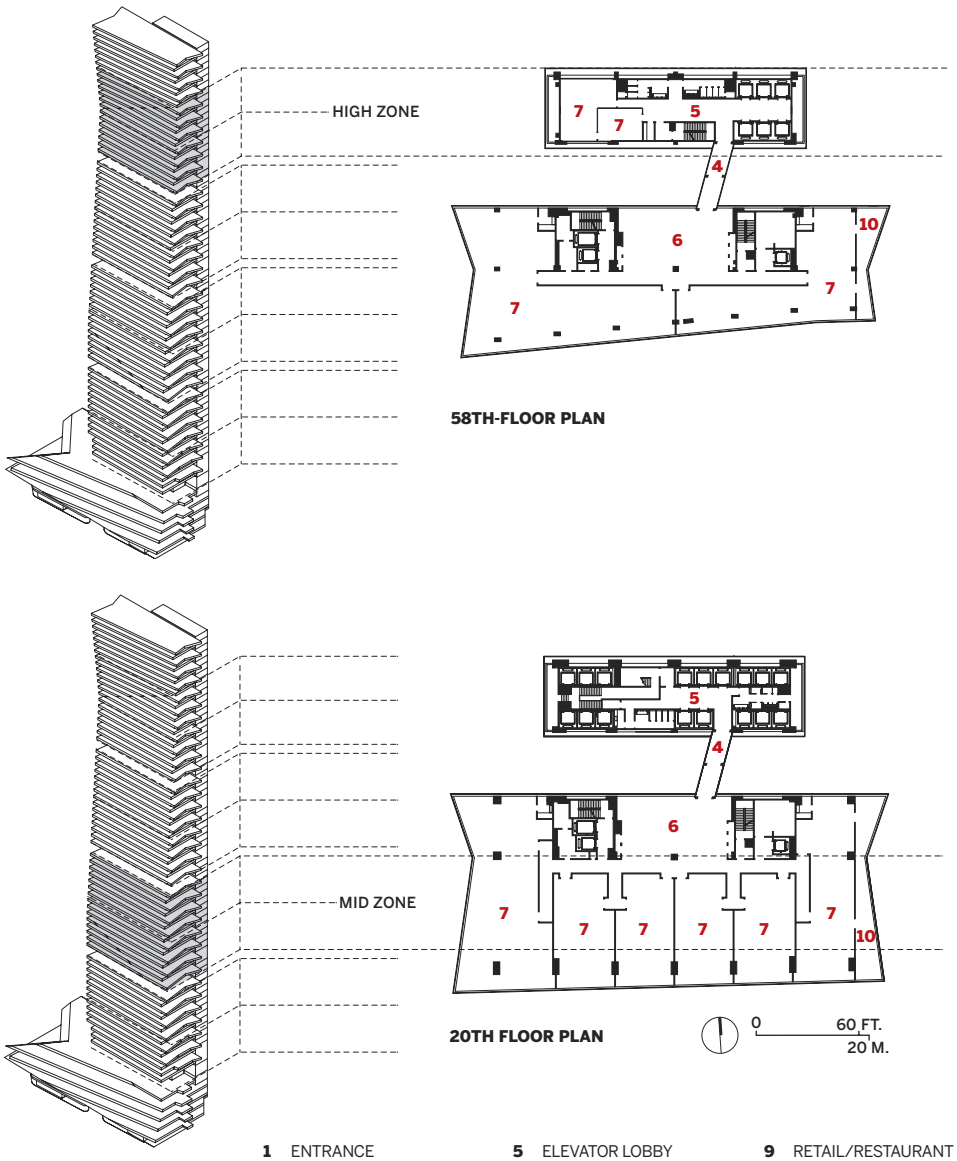






SECTION A - A

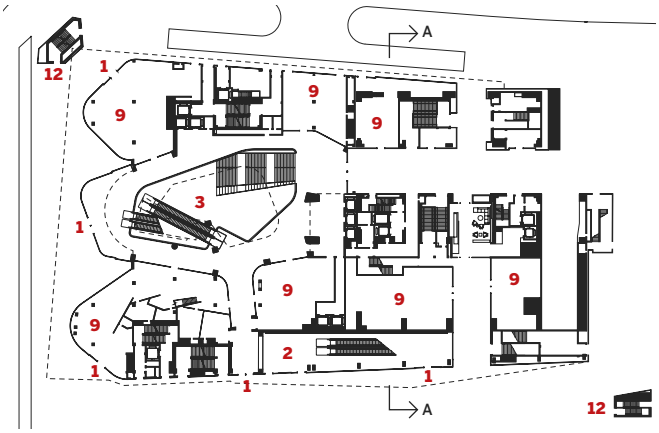




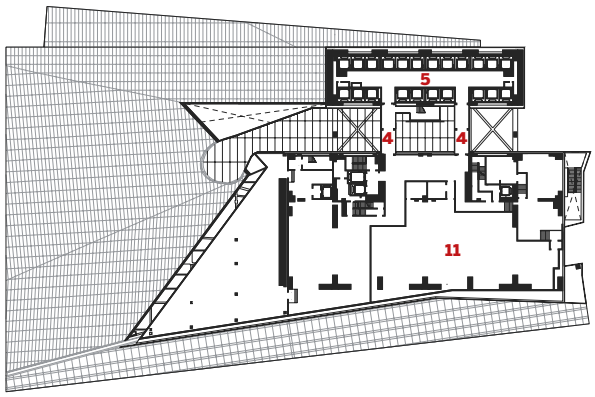
58TH-FLOOR PLAN

20TH FLOOR PLAN

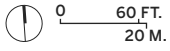
1 ENTRANCE
2 OFFICE ATRIUM
3 RETAIL ATRIUM
4 BRIDGE
5 ELEVATOR LOBBY
6 LOBBY
7 OFFICE
8 OFFICE LOBBY
9 RETAIL/RESTAURANT
10 TERRACE
11 EQUIPMENT
12 PARKING EXIT STAIRS



FIRST-FLOOR PLAN

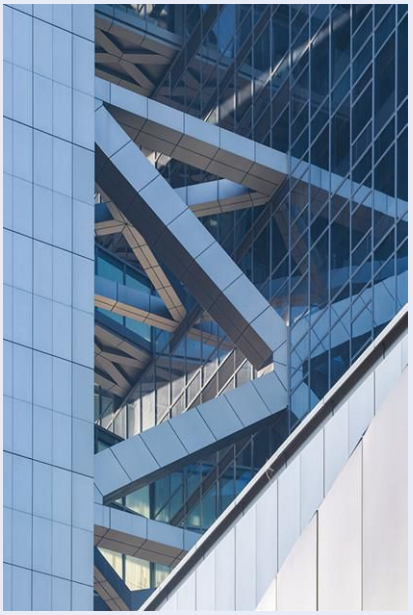


FIFTH-FLOOR PLAN



INDENTATIONS in the main tower are emphasized by its smooth glass skin. The corset-like armature joining it to the detached core does a lot of work in a climate known for its seismic and wind forces.

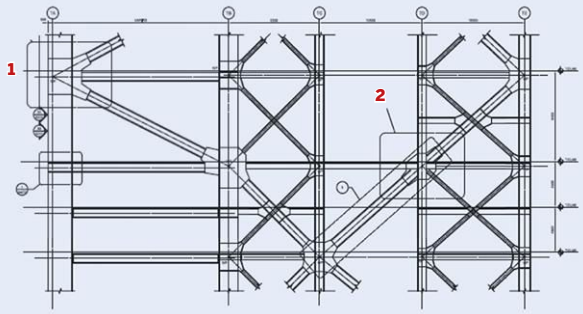
Brace Yourself



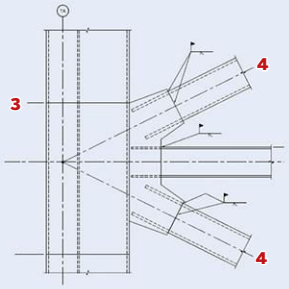
ACCORDING to Patrick Ragan, the project engineer for Halvorson and Partners (now absorbed by WSP) on the Hanking Center, the joints were key. The points of connection for the steel braced-frame structure binding the detached core to the main tower required special attention (above and right). As indicated by the section diagram of the beam/column/bracing joints (far right), which is cut along one of the two primary north–south bracing lines, diagonal steel tubes cross from the entrance facade of the main structure to the back face of the detached service core. In doing so, the bracing engages all the columns and helps resist lateral overturning forces. The detail of a typical connection (right, bottom) shows the intersection between the concrete-filled column, the diagonal steel-box sections, and the wide-flange steel floor beams; it is accompanied (far right, bottom) by the polychromatic isometric drawing from a structural-analysis joint model that highlights the complex geometry of the different plates' coming together.

PHOTOGRAPHY: © WU FEI

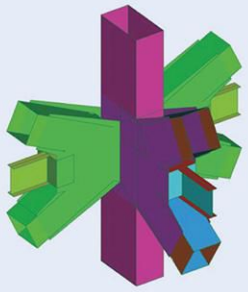
JOINT CONNECTIONS



BRACING SECTION—ELEVATION



JOINT 1: DETAIL OF TYPICAL CONNECTION



JOINT 1 MODEL

1 JOINT 1
2 JOINT 2
3 COLUMN SIDE PLATE
4 PRIMARY BRACE



started in 2012, and the core and shell were constructed by 2018, even if the interior design is ongoing.

Although steel's ductility helped the tower meet seismic code restrictions, there was also the wind force to consider. Robert Halvorson (now retired, and whose firm has become part of WSP) points out that wind loads in Shenzhen's location on the South China Sea are severe, with typhoons often raging between May and December, so you need to design for twice the amount of wind load common in Miami or other hurricane areas in the U.S. While concrete and composite structural systems offer twice the lateral stiffness of steel structures, the whole team favored steel for its strength and compactness, despite its being more expensive in China than concrete. The engineers arrived at a compromise—the columns have a concrete center with steel plates enclosing them. This composite solution allowed the columns to be heavier than steel alone, but lighter and slenderer than concrete. "We got approval to call it a 'steel' building, even with a steel/composite system for the columns," says Halvorson. The strategy meant "welding in the field, adding to construction time, but allowed us to abide by a more reasonable lateral-stiffness code requirement and reduce material quantities, column sizes, and costs."

OFFICE LOBBIES on the third and fourth levels of the podium face south (above). The main entrance is on the west (opposite).

Other design moves helped counter seismic and wind forces. Not only are the main tower and the detached core linked by the pedestrian bridges at every floor, but the team inserted horizontal diaphragms, composed of beams and diagonal bracing, on every fourth level; they act like floor slabs linking the two structures. But—since the main building's facades are of slightly different lengths, owing to its idiosyncratic geometry—the detailing of these bracing modules was tricky.



The pedestrian bridges linking the two structures, about 10 feet wide and 35 feet long, form an important experiential aspect of the concept. Says Mayne, "You look at the city from various sides—not only in the 270-degree view from the offices, but, when you walk across a bridge to the north, you see more of the city through solid glass. You are connected to the urban environment." And everyone will traverse the bridges frequently, not just to use the elevators: "We even put the restrooms in the detached core," he adds.

Since the pandemic has kept the American architects from being on the scene during the final stages of fit-out, they are waiting to see how it all came together when they visit in September, as planned. While some retail had a soft opening in September 2020, most shops and restaurants are expected to debut this fall, bringing life to the public spaces. But the rest of us will have to wait a little longer to assess the success of the bold, adventurous Hanking Center. ■

Credits

ARCHITECT: Morphosis Architects — Thom Mayne, principal and design director; Eui-Sung Yi, project principal; Hann-Shiuh Chen, project manager; Jamie Wu, Amit Upadhye, Mario Cipresso, project architects

ARCHITECT OF RECORD: Zhubo Design

ENGINEERS: Halvorson and Partners (now WSP) — Robert Halvorson, principal, Patrick Ragan, engineer (structural); John A. Martin (structural concepts); Stantec (m/e/p and facade concepts); Parsons Brinckerhoff (m/e/p/fp)

GENERAL CONTRACTOR: China Construction Fourth Engineering Division Corp

CONSULTANTS: w.erk studio (general tower); RWDI (wind)

CLIENT: Hanking Group

SIZE: 1.8 million square feet

COST: withheld

COMPLETION DATE: 2018 (core and shell); interior ongoing

Sources

STEEL: Wuyang Steel; Xingcheng Special Steel Works

ELEVATOR: Hitachi

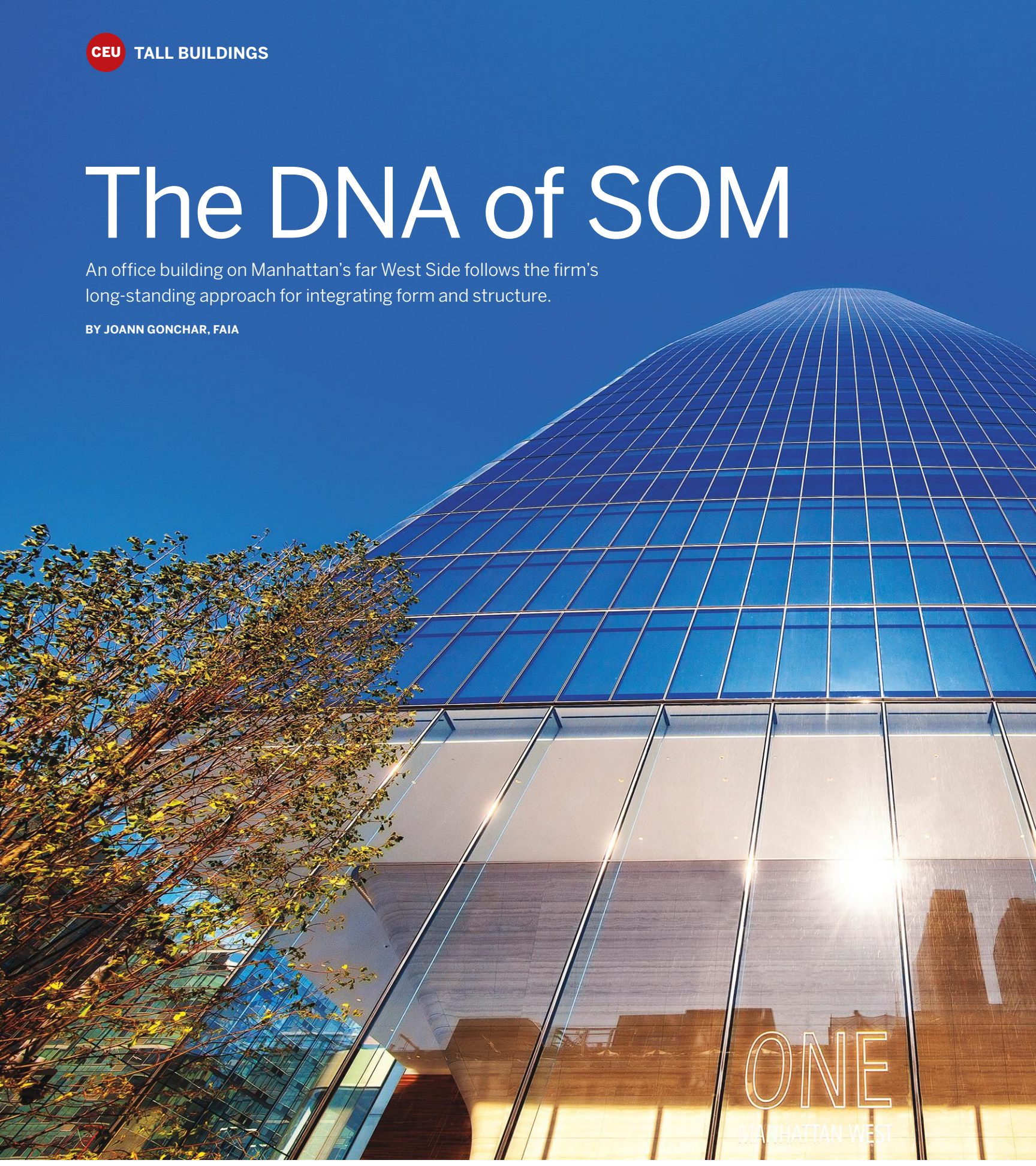
PAINT/COATING: AkzoNobel; Hempel A/S; Jotun; PPG

CEILINGS: Compton Metal Ceilings

The DNA of SOM

An office building on Manhattan's far West Side follows the firm's long-standing approach for integrating form and structure.

BY JOANN GONCHAR, FAIA





PHOTOGRAPHY: FADI ASMAR © SOM, EXCEPT AS NOTED

THE SUBTLE bow and bend of One Manhattan West's east facade is achieved primarily with flat glass, but also uses some curved panels.

SKYSCRAPERS designed by Skidmore, Owings & Merrill (SOM) don't show an obvious family resemblance—the venerable firm's tall buildings are formally diverse. They include Chicago's Willis Tower (1974), the Miesian office building previously known as the Sears Tower and made up of square "bundled tubes," and the Burj Khalifa, in Dubai—still the world's tallest tower 11 years after completion—with its seemingly spiraling pinnacles buttressing its core (RECORD, August 2010). But despite the aesthetic range, SOM buildings do have a common thread of DNA, says Gary Haney, design partner for One Manhattan West, a recently completed 67-story office building on New York's far West Side."It is impossible to invent shapes without thinking about structure," says Haney, now a consulting partner of SOM. "It is part of our ethos."

One Manhattan West is definitely the progeny of this philosophy, but just how so is not apparent from afar. On the skyline, the 996-foot-tall tower appears as a straightforward though refined shaft—an extrusion of repeated rectangular floor plates within a taut glass skin. From closer range, its rounded corners come into view, and one can see that its east-facing facade gently bows, and slopes back, creating a profile that subtly tapers toward its crown. However, the SOM genes truly reveal themselves where the building meets the ground. Here there are no perimeter columns. So, even without entering, passersby can look beyond the ultratransparent, mullionless enclosure (supported only with structural glass fins) into the lobby, taking in its main event: a muscular pedestal-shaped element at the center, clad in striated travertine, that gracefully flares outward toward the 45-foot-high ceiling.

The travertine feature is more than a sculptural conceit. Behind the stone (quarried, milled, and installed so that its veins seem continuous, even around corners) is the building's reinforced-concrete core, with walls up to 4 feet thick, and a robust framework of steel diagonal "kickers," each 75 feet long. These transfer the loads from the perimeter columns on the floors above through the core and to the foundations. The structural gymnastics are a direct response to the conditions below grade, where there was limited avail-



ON THE SKYLINE, the tower appears as a refined shaft (left). The drama, a travertine enclosure for a robust structure, is evident at closer range, through the lobby's transparent glazing (opposite, top and bottom).

able terra firma on which the tower could touch down. The building sits on foundations representing only about 30 percent of its footprint. "It is as though it is standing on tippy-toes," says Kim Van Holsbeke, an SOM design director.

So little bedrock was accessible because the tower, as well as the surrounding eight-acre Manhattan West complex, is built over active passenger rail lines that connect to nearby Pennsylvania Station. The nearly complete $4.5 billion development—which sits between the James A. Farley Post Office recently transformed by SOM into Moynihan Train Hall (RECORD, February 2021) and the mega-development Hudson Yards—encompasses 7 million square feet of office space, apartments, hotel rooms, restaurants, and retail in six buildings, four of which were designed by SOM, which also created the master plan.

Developed by Brookfield Properties, Manhattan West has been a long time in coming. Olympia & York, a Brookfield predecessor company, acquired the first parcel of land in 1985. Sabrina Kanner, then just starting her career at Olympia & York and now Brookfield's executive vice president of development, design, and construction, says she was "just a kid in steel-toed boots" and did not see the potential of what was then primarily a void over the train tracks with some at-grade parcels used mostly for parking. But she now describes the emerging complex as a pedestrian-friendly neighborhood, a "people place." Toward that end, the developer has decked over Dyer Avenue—a vehicular approach to the Lincoln Tunnel that ran through the site—and, with the landscape firm James Corner Field Operations, created an event plaza and other outdoor spaces. By the end of 2022, the "spur," a branch of the immensely popular elevated park the High Line, will be extended to meet Manhattan West.

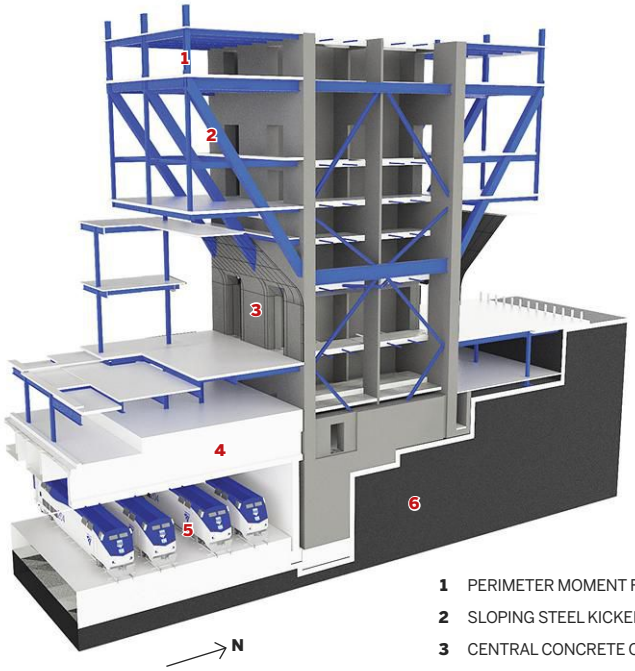
One Manhattan West was conceived as the centerpiece of the new neighborhood, along with Two Manhattan West, a slightly shorter office building at 912 feet tall and 60 floors, still under construction. Like its sibling, the second tower will have a tight glass skin and one tapering and bowing face, but the angled facade will be its north elevation instead of the east one. Together, the pair will mark either side of the events plaza, which sits directly across the street from the new Moy-

PHOTOGRAPHY: LUCAS BLAIR SIMPSON © SOM (THIS PAGE AND OPPOSITE, BOTTOM)


ONE MANHATTAN WEST
395
395


395





CORE SECTION—AXONOMETRIC DIAGRAM

1 PERIMETER MOMENT FRAME
2 SLOPING STEEL KICKERS
3 CENTRAL CONCRETE CORE
4 SITE-WIDE PLATFORM
5 RAIL LINES
6 BEDROCK

Credits

ARCHITECT: Skidmore, Owings & Merrill — Gary Haney, design partner; Kenneth A. Lewis, T.J. Gottesdiener, managing partners; Kim Van Holsbeke, design director; Julia Murphy, managing director; Charles Besjak, Preetam Biswas, structural engineering directors; John Hollenberg, Joseph Chase, associate directors

ENGINEERS: Skidmore, Owings & Merrill (structure); Jaros, Baum & Bolles (m/e/p); Philip Habib and Associates (civil); Mueser Rutledge Consulting Engineers (geotechnical)

CONSULTANTS: James Corner Field Operations (landscape); Speirs + Major (lighting); Brandston Partnership (crown lighting); Vidaris (energy and enclosure); AKRF, WCD Group (environmental); DVS (security); Thornton Tomasetti (threat analysis); Cerami & Associates (acoustics)

GENERAL CONTRACTOR: Tishman Construction

CLIENT: Brookfield Properties

SIZE: 2.1 million square feet

COST: $1 billion

COMPLETION DATE: October 2019

Sources

GLAZING: AGC Interpane, Tvitec, Cricursa

CURTAIN WALL: Benson Industries

STOREFRONT: Sedak, W&W Glass

ENTRANCES: Blumcraft

LOCKSETS: Schlage

TRAVERTINE: Travertini Paradiso

GRANITE PAVERS: Polycor

ZEBRAWOOD PANELS: ADF Designs

LOBBY LIGHTING: Zumtobel Group, Cooper Lighting, acdc

CROWN LIGHTING: Traxon Technologies

ELEVATORS: Schindler Group

WITH NO perimeter columns at the ground, the glazing is supported by structural glass fins that nearly disappear (opposite). A sculptural zebrawood wall separates the retail podium from the lobby (right).

nihan Train Hall. The towers make an "ensemble" and are "in dialogue," says Van Holsbeke.

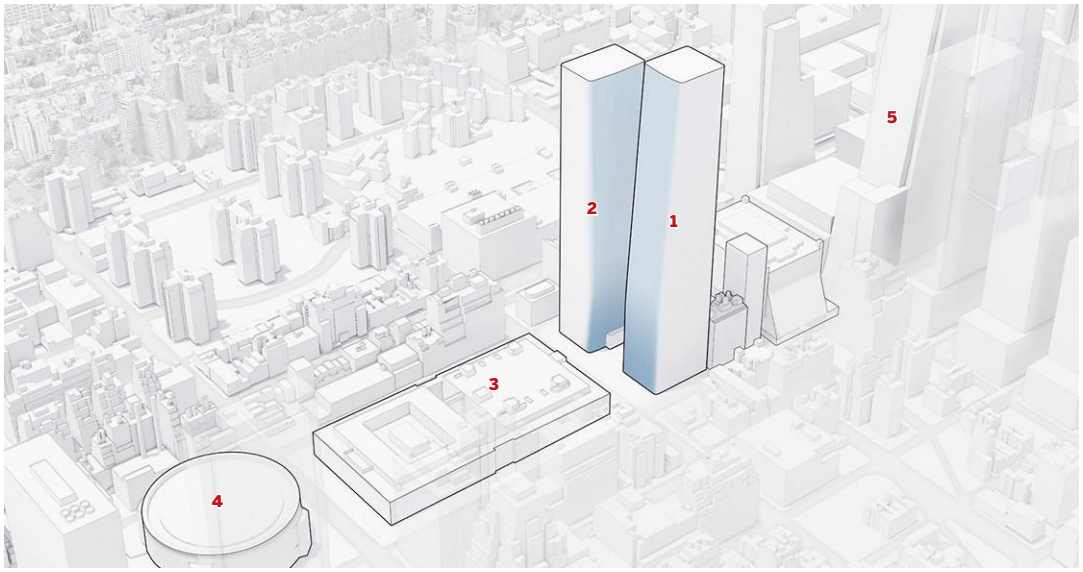
Despite their similarities, Two's base will be quite different from that of One. Due to the particular arrangement of the tracks under it, the shorter building will have eight perimeter megacolumns at lobby level and a braced central core of steel, only half of which will reach bedrock. Below grade, one-story-tall trusses will redirect the building's loads to available zones between the tracks, explains Charles Besjak, structural engineering director for SOM. And, as a reflection of its structural configuration at the ground level (and below), the architectural expression of the lobby will be distinct from that of One, with the steel-framed core clad in eucalyptus wood and the megacolumns in stainless steel. "While different, it will be equally dramatic," promises Haney.

Van Holsbeke says the aim is to make the towers appear almost as though they were milled from blocks of stainless steel, rather than clad in glass. At One, this effect has been achieved with a curtain wall of structural silicone glazing and a combination of flat and curved—but mostly flat—high-performance panels. The insulated glazing units (IGUs) for the building's rounded corners were "hot bent" in the factory, while the few curved panels necessary to achieve the angle of the east facade, concentrated between floors 4 and 19, were "cold bent" on-site, during erection. The architects used parametric modeling extensively, both to visualize how many flat, faceted IGUs could be used and still achieve the appearance of a smooth and uninterrupted radius, and to understand the cold bending tolerances of the glass and the curtain wall assembly, explains Julia Murphy, an SOM managing director.

On the inside, the glazing strategy yields offices with floor-to-ceiling glass, and from the upper levels allows for sweeping views of the city, the Hudson River, and beyond. Coupled with 13-foot 6-inch slab-to-slab heights and a core-to-perimeter depth of about 42 feet, the approach yields daylight-filled, flexible office spaces that have proved appealing to a variety of tenants, including white-shoe law firms, accounting firms, and the National Hockey League. The building is 90 percent leased, while Two, slated for comple-

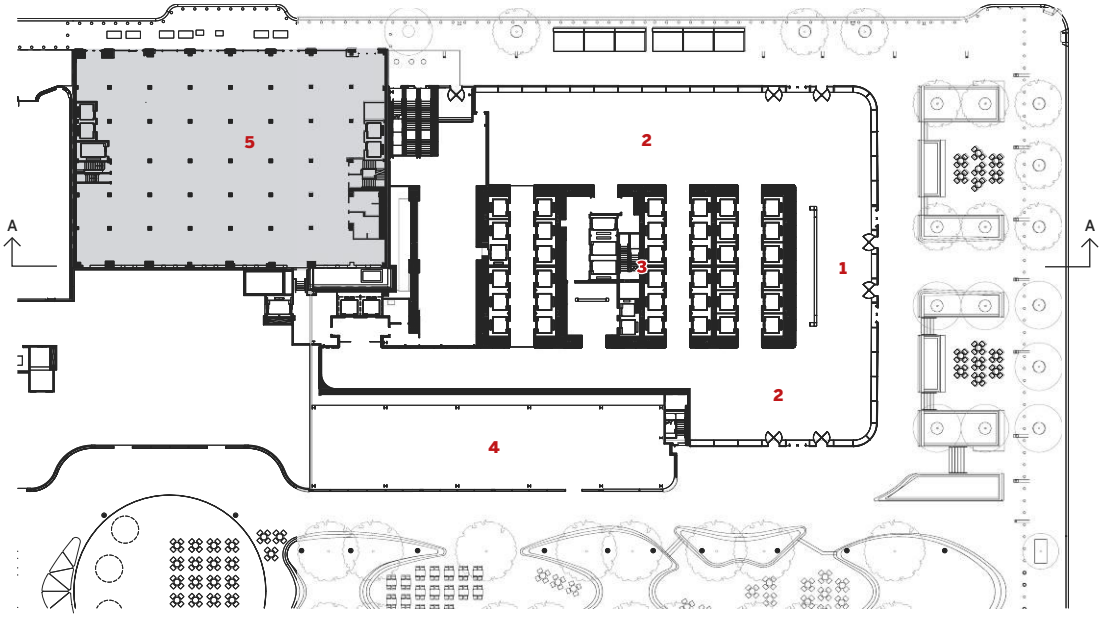


PHOTOGRAPHY: LUCAS BLAIR SIMPSON © SOM



SITE DIAGRAM

1 ONE MANHATTAN WEST
2 TWO MANHATTAN WEST (UNDER CONSTRUCTION)
3 MOYNIHAN TRAIN HALL
4 MADISON SQUARE GARDEN
5 HUDSON YARDS



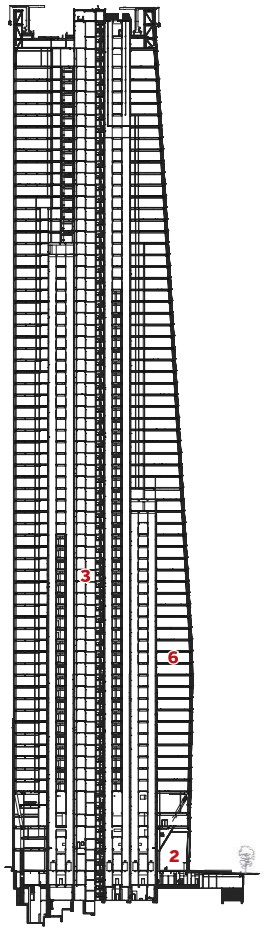
GROUND-FLOOR PLAN

1 RECEPTION
2 LOBBY
3 CORE
4 RETAIL PODIUM
5 RENOVATED LOFT BUILDING
6 OFFICE SPACE



33RD-FLOOR PLAN

0 30 FT. 10 M.



SECTION A - A

0 100 FT. 30 M.

tion in 2023, has secured an anchor tenant for 13 floors, according to Brookfield's Kanner.

Although pundits are questioning the post-pandemic relevance of the office building, especially now that many companies have shown that remote work can be effective, Kanner is optimistic about the market. She insists that there is no substitute for the creativity that in-person collaboration allows, and maintains that even if employers don't require a return to the office full-time, workers will still need designated desks.

For the moment, it is unclear how strong the demand for office space in New York (and other urban centers) will be as restrictions ease. It is uncertain if and when tourists and workers will return and how soon the environment that Kanner describes, with people dining at the complex's restaurants, shopping in its retail outlets, and meandering through its outdoor spaces, might materialize. But, whatever the future, One Manhattan West's structural acrobatics and subtle curves make it an elegant addition to the city's far West Side. ■



THE TAUT skin is intended to make the building seem as though it were milled from stainless steel (top). The envelope strategy yields office spaces with floor-to-ceiling glazing and, from the upper floors, sweeping views, as shown in a rendering (above).

IMAGES: LUCAS BLAIR SIMPSON © SOM (TOP); COURTESY BROOKFIELD PROPERTIES (BOTTOM)



THE BUILDING springs up in four- to five-floor tiers (this page). Its base features a striated screen of aluminum Z-channels (opposite).



Jagged Edge

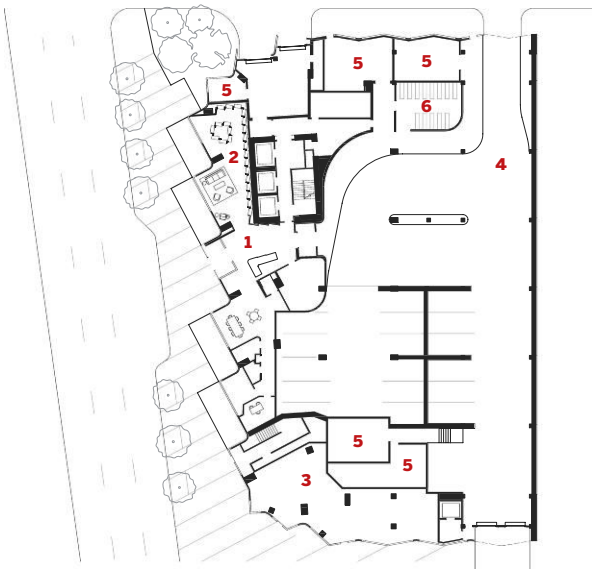
Bordering a park, Studio Gang's sawtooth-shaped apartment tower rises above its St. Louis neighborhood.

BY JOHN KNUTESON
PHOTOGRAPHY BY SAM FENTRESS

FOREST PARK has been the 1,300-acre centerpiece of St. Louis for nearly 150 years: it hosted the 1904 World's Fair and is home to many of the city's beloved museums, gardens, and historical structures. Today, a new building punctuates the northeast corner of the park. Completed last fall, Studio Gang's One Hundred is the firm's first project in St. Louis. The tower houses 316 residential units ranging from studios to three-bedrooms and rises 36 levels above the Central West End neighborhood. Located near mansion-lined Lindell Boulevard at an intersection of a main artery, North Kingshighway, the building takes advantage of some of St. Louis's finest views. To the west, it overlooks the rolling green space of Forest Park, while to the east, the building sits almost directly on axis with the Gateway Arch and downtown St. Louis.

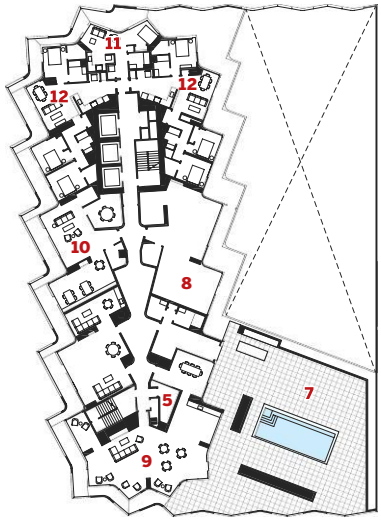
A bustling district, with a vibrant streetscape of shops and restaurants, the Central West End was one of the neighborhoods that suffered least from the impact of urban decay that afflicted the city in the mid- to late 20th century. Vestiges of the neighborhood's historic grandeur are speckled throughout the area, such as the Art-Deco Chase Park Plaza hotel and apartments. Until One Hundred surpassed that building by eight floors, the 28-story Park Plaza tower was the most prominent landmark in the area. For the design team, it was important for One Hundred to engage with this context. According to Studio Gang design principal and partner Juliane Wolf, "We wanted to

PHOTOGRAPHY: © TOM HARRIS

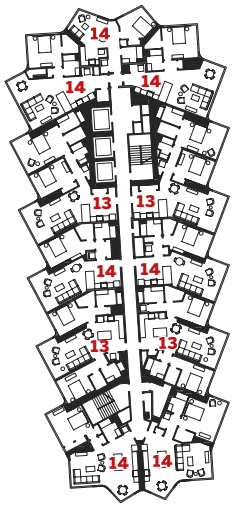


GROUND-FLOOR PLAN

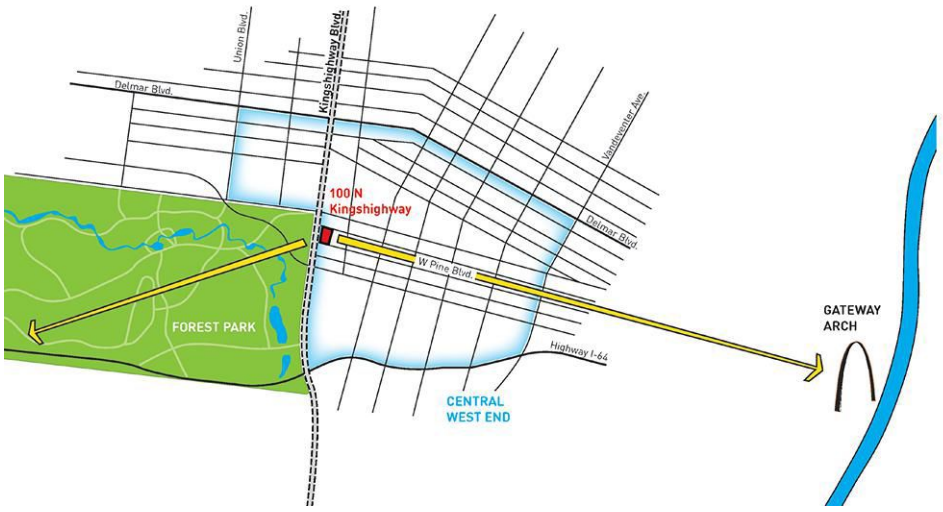
0 30 FT.
10 M.



LEVEL 7 - AMENITY PLAN



LEVEL 14 - TYPICAL FLOOR PLAN



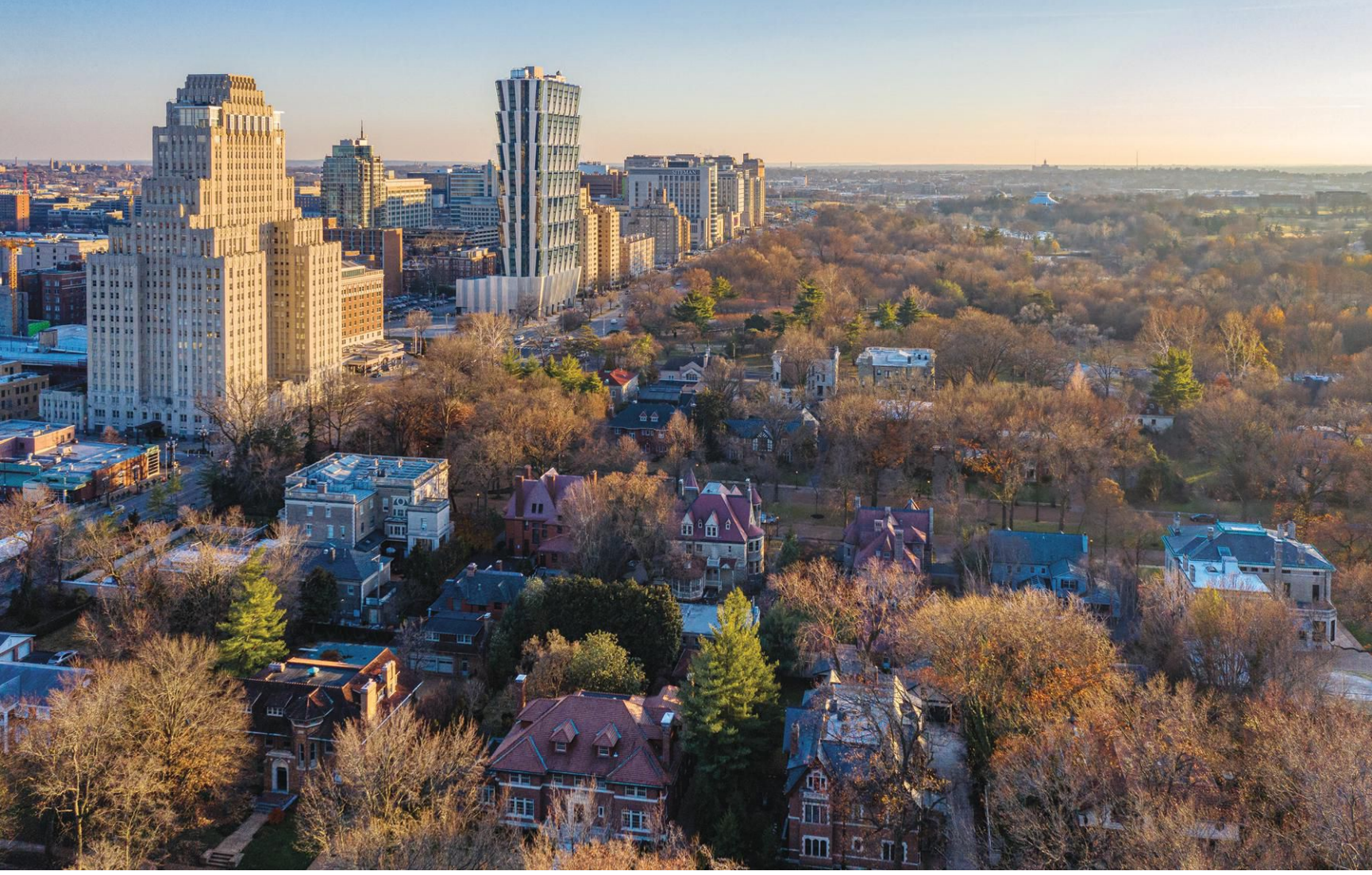
1 LOBBY
2 MAILROOM
3 RETAIL
4 PARKING
5 UTILITY ROOM
6 BICYCLE ROOM
7 AMENITY DECK
8 FITNESS ROOM
9 PARTY ROOM
10 BUSINESS LOUNGE
11 STUDIO
12 3-BEDROOM UNIT
13 2-BEDROOM UNIT
14 1-BEDROOM UNIT

create a massing that continues the street wall of Kingshighway and finds its place within the other tall buildings—Chase Park Plaza and Barnes Jewish Hospital—that define that edge." The building also adds roughly 95 linear feet of retail frontage at street level, with the first tenant, a Pilates Lab, set to open in May.

The most striking feature of the new building is its distinctive shape. Above a horizontal podium consisting of the ground floor, parking levels, and an amenities level, the tower rises in a series of four- or five-floor tiers, each splaying upward in a pattern of oblique angles. One Hundred is the latest in a trio of ground-up projects that Studio Gang has completed with Chicago developer Mac Properties, each with successively more complex exterior skins that address conditions of natural light and solar heat gain. Studio Gang's earlier projects with Mac Properties, City Hyde Park and Solstice on the Park, both in Chicago, foreshadowed the formal decisions made at One Hundred. But while those two buildings manipulated the skin solely in the horizontal or vertical axis, respectively, the faceted facade of One Hundred contorts in both directions, maximizing views and daylight.

The splaying of the exterior wall was born from the desire to connect residents with the outdoors. Among the client's initial goals for the project was for a quarter of the units to have exterior space. By pushing the envelope outward, the "roof" of each tier becomes a terrace for the first floor of the tier above. The outward thrust comes with a trade-off: the units at the top of each tier have more enclosed space, while units at the bottom are smaller but offer private terraces. The curtain wall's slant also improves thermal performance: it reduces solar heat gain in the summer, when sun angles are steeper, but permits lower winter rays. This geometry was not without its challenges: the building required a structural strategy to support the cantilevering floors of each tier. To achieve this, the concrete structure is braced by a vertical core within the northern portion of the floorplate. At the perimeter, the columns align vertically throughout the building but are adapted into a wedge-shaped profile that transfers the load of each additional floor.

The shape of the floor plate was inspired by the plant life of Forest



ONE HUNDRED is part of the street wall along the eastern edge of Forest Park, whose north side is lined with century-old mansions (above). Rotated unit layouts create dynamic living spaces with views in multiple directions (right).



Park: the plan resembles the outline of a leaf, with jagged edges symmetrical around a central north–south spine. The corridor forms a central axis, and each unit rotates south about the spine, maintaining a 90-degree glazed corner at each living room. This essentially makes each apartment a "corner unit" with multidirectional views. Studio Gang took particular care to ensure that there is a direct view to the exterior from the entrance to each unit, adding to a feeling of openness in the nonorthogonal layouts.

The subtle rotation of the units results in a building that appears to be different from virtually every angle. The materiality of the exterior skin plays a critical role in this respect. The facade alternates between regions of transparent curtain wall glazing and corrugated anodized-aluminum rainscreen panels. According to the design team, the material decisions were inspired by the stainless steel of the Gateway Arch and the way it reflects its

environment. This textured expression, as opposed to the minimal appearance often associated with curtain wall construction, feels appropriate in the historic brick-and-masonry character of its context. The facade is wonderfully dynamic, particularly as seen from Forest Park, where the tower has a strong visual presence. The pattern of transparent curtain wall and aluminum rainscreen enhances the experience of the building "in-the-round." From the north, the aluminum shards dominate while, from the south, the curtain wall makes the building appear more open and transparent. The material expression is consistent from base to top; at the podium, the anodized aluminum panels become a striated screen of vertical Z-channels, allowing for natural ventilation at the parking levels and contributing to the project's sustainability program.

One Hundred is full of inflections: between downtown and Forest Park, between the city's past and its future. It serves as a bold new landmark for the Central West End that still subtly responds to the context through its massing, geometry, and materiality. The tower adds to the rich and layered history of its neighborhood while embodying an optimistic outlook for the city of St. Louis. ■

John Knuteson is a practicing architect and educator based in St. Louis.





Credits

ARCHITECT: Studio Gang — Jeanne Gang, founding principal and partner; Mark Schendel, managing principal and partner; Juliane Wolf, design principal and partner; Margaret Cavenagh, design principal; William Emmick, principal of design management; Jason Flores, senior project leader; John Dolci, senior project leader; Aurelien Tsemo, design management director

ENGINEERS: Magnusson Klemencic Associates (structural); dbHMS (m/e/p); Charles E. Jarrell Contracting Co (mechanical); Sachs Electric (electrical)

CONSULTANTS: Studio NYL (facade); MorLights (lighting); WGI (parking)

GENERAL CONTRACTOR: Clayco

CLIENT: Mac Properties

SIZE: 517,000 square feet (excluding parking)

COST: withheld

COMPLETION DATE: November 2020

Sources

METAL PANELS: Morin

CURTAIN WALL: Ventana Design-Build Systems

GLASS: Tianjin SYP Engineering Glass Co

ENTRANCES: Ventana Design-Build Systems, YKKAP, CMI Architectural

WOOD DOORS: Jeld-Wen

HARDWARE: Hager, C.R. Laurence



THE SPLAYING form creates units with private terraces (opposite). The crownlike tower is a new neighborhood landmark, surpassing the 28-story Chase Park Plaza just north of it (this page).

One Fell Swoop

In Seattle, NBBJ designs a mixed-use skyscraper that bows to its midcentury neighbors.

BY RUSSELL FORTMEYER
PHOTOGRAPHY BY MORIS MORENO

HUMILITY is not a word often associated with skyscrapers, but scale need not override context in architecture. When the site is a downtown Seattle block anchored on one corner by Minoru Yamasaki's Rainier Tower—a beloved local icon with a white, flared concave base supporting 41 stories—context is everything. Even Yamasaki, a native of Seattle, approached the design for his 1977 building in response to his own earlier work, diagonally opposite Rainier Tower, for the 1964 IBM Building, a 20-story high-rise generally considered the precursor to his 1973 World Trade Center in New York.

Adding to this high-Modernist mix, NBBJ Architects has gingerly inserted its new 1.3 million-square-foot Rainier Square—a 59-story mixed-use skyscraper completed in September 2020—on the block's northwest corner, with a gentle upward slope that performs almost like the architectural equivalent of a bow down to the older landmark. The geometry of Rainier Tower's inward-curving base informed the swoop of Rainier Square as it transitions from a four-story retail podium on Fifth Avenue to the 33 stories of office floors that diminish in size as they rise, topped by the even skinnier 20 stories of residential tower. Mechanical floors at levels 38 and 59 complete the building.

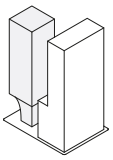
Mindy Levine-Archer, a partner with NBBJ, describes the new high-rise's combination of vertical and angled flat glass curtain wall panels as an "accordion" in the way it arcs upward without employing curved elements. NBBJ adopted this geometrical strategy as a way to transition from the larger floor plates for the offices to the smaller floor plates for the dwellings higher up. "In Seattle, residential buildings have a limited floor plate size, whereas offices do not, so we had to think how we were going to go from one to the other in an elegant way," says Levine-Archer. Seattle's Municipal Code regulates residential floor plate sizes as a ratio to the block size when buildings exceed minimum heights, a threshold Rainier Square, at 850 feet high, easily surpassed.

The project's original brief, selected through a call for proposals by the site's landowner, the University of Washington, envisioned six levels of subterranean parking, plus the retail podium, tenant office space, market-rate rental housing, and a separate 12-story hotel tower, as well as common areas and amenity space. In 2019, the hotel tower design was changed to tenant office floors to meet evolving market conditions. The tower's office block includes a garden deck, with a landscape designed by Seattle-based GGN, as part of the lobby and amenity areas

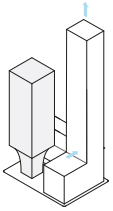




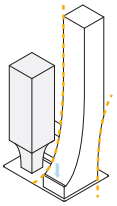
THE CARVED base of Minoru Yamasaki's Rainier Tower informed Rainier Square's gentle slope.



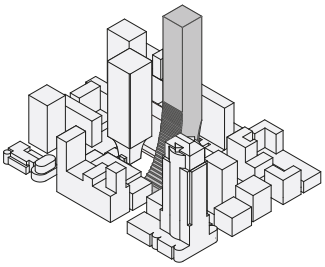
Massing derived from city zoning

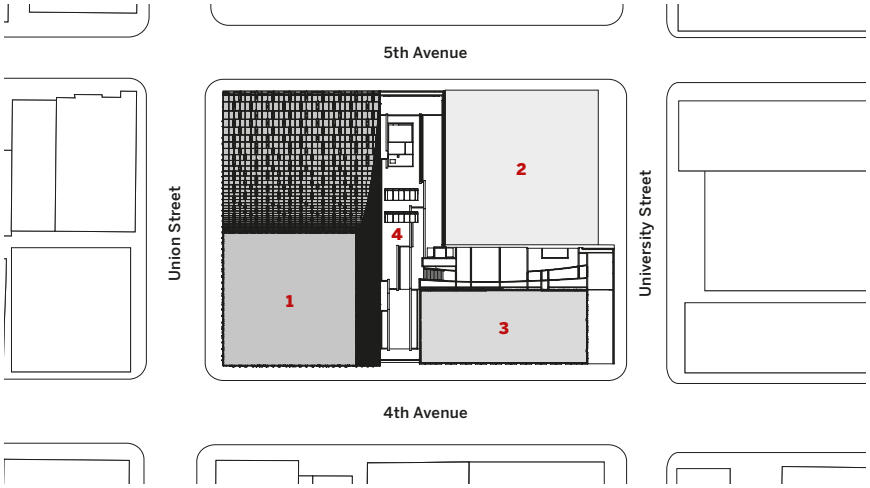


Massing shifted to improve views to and from Rainier Tower



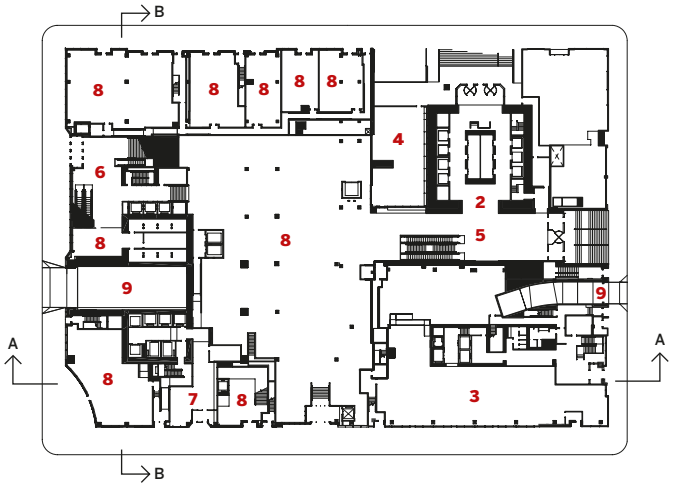
New high-rise form sympathetic to Rainier Tower





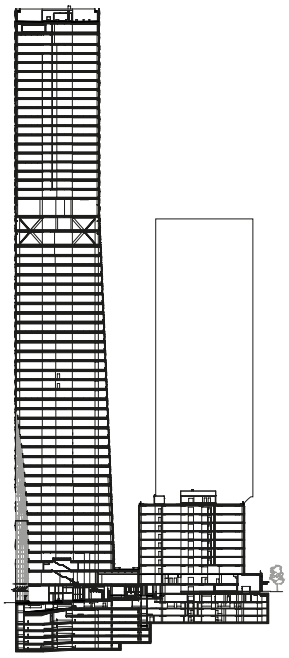
SITE PLAN

1 RAINIER SQUARE
2 RAINIER TOWER (EXISTING)
3 400 UNIVERSITY (FUTURE OFFICE BUILDING)
4 COURTYARD/DECK
5 FUTURE LOBBY CONNECTION
6 OFFICE LOBBY
7 RESIDENTIAL LOBBY
8 RETAIL
9 GARAGE ENTRY/EXIT
10 OFFICES

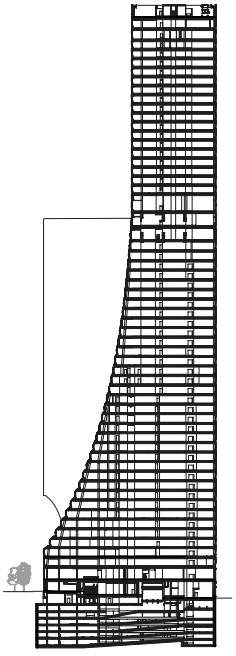


LEVEL-ONE PLAN

0 100 FT. 30 M.

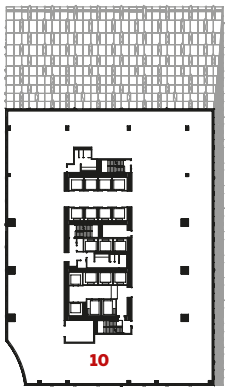


SECTION A - A

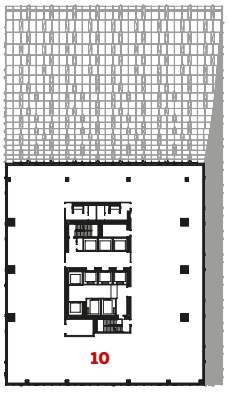


SECTION B - B

0 100 FT. 30 M.



LEVEL-15 PLAN



LEVEL-25 PLAN

0 50 FT. 15 M.

VERTICAL AND ANGLED flat glass curtain wall panels act as an "accordion," arcing upward without employing curved elements (above). A glazed scoop adds definition to street-level retail (right).



on floors two and three, which sit within the retail podium. A residential sky lobby at levels 39 and 40 contains a separate elevator bank for accessing the apartments above and has space for luxury amenities.

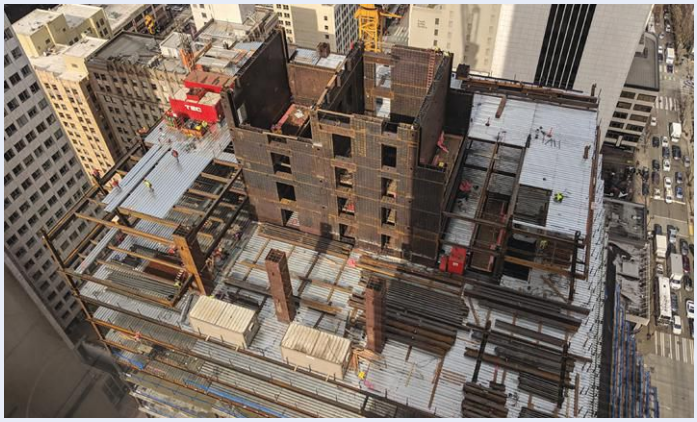
Greg Johnson—CEO of Seattle-based developer Wright Runstad & Company, which controls the 80-year ground lease for the project—found the diversity of uses in the stacked program presented flexibility in vertical organization during the design stage. And the development team appreciated the University's interest in maintaining views and daylight access to Yamasaki's tower, which the institution also owns. "We weighed those considerations with the expectations for dramatic design, and the need to attract office tenants and residents to premium apartments," Johnson says. Amazon leased the entire office space early on but, while considering a reduction in its workforce in Seattle, is now opting to sublease rather than occupy it, despite the tough commercial market.

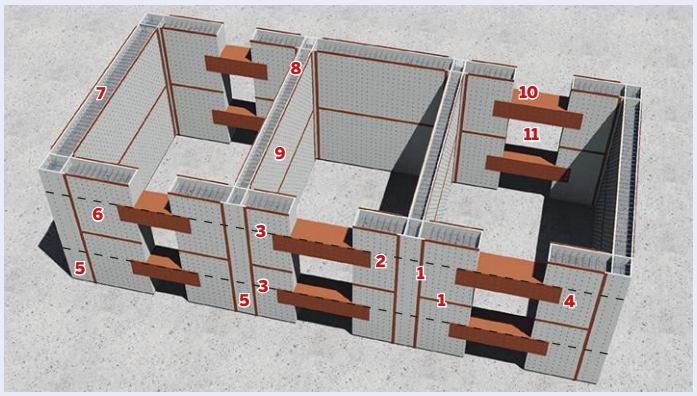
Levine-Archer and her team were sensitive to the fact that the building—Seattle's second-tallest—

Radical at its Core

DEMANDS to reduce the budget and expedite construction are two imperatives at top of mind for most private developers. Rainier Square's speed core design solves a problem that plagues tall building construction everywhere: how to minimize a schedule lag when building a concrete core that leads the erection of the surrounding steel structure. Choreographing separate trades, which are simultaneously adding floors in their respective materials, only exacerbates the issue.

Ron Klemencic, chairman and CEO of Magnusson Klemencic Associates, the project's structural engineer, had never implemented his idea for a composite-plate shear wall core—or what is now called the "speed core"—on a high-rise before. Originally conceived in 2009 as a collaborative research project with Purdue University and subjected to years of testing, the speed core at Rainier Square consists of eight concrete-filled steel box columns at the core's corners, each one the thickness of the core wall. Steel sandwich blocks (ranging from 21 to 45 inches thick) formed with two 14-foot-high steel plates (varying in thickness from ½ inch to ¾ inches) and tied together with protruding steel rods 12 inches on center, were craned into place between each set of columns. The 536 core panels on the tower range in length from 30 to 40 feet, in line with the building's structural bays, with some unique geometries to account for core openings.





SPEED CORE COMPONENTS

1 HORIZONTAL AND VERTICAL PLANEL SPLICES
2 PRE-ATTACHED LEDGER ANGLES FOR DECK SUPPORT
3 BUILDING FLOOR LEVEL
4 PRE-DRILLED HOLES FOR REBAR
5 WALL CORNER COLUMN
6 PRE-ATTACHED SHEAR CLIPS FOR STEEL-BEAM FRAMING CONNECTIONS
7 CROSS-TIES
8 CONCRETE INFILL
9 COMPOSITE PLATE SHEAR WALL PANEL
10 COMPOSITE COUPLING BEAM
11 ROUGH OPENINGS INTO CORE



A DIAGRAM shows the tower's overall structure (above), and a construction shot depicts the speed core being erected as decking rises around it (left).

Once set, the panels were field-welded to the box columns to seal the corners. The panels perform double duty in construction—they deliver strength to support the ongoing erection of the primary steel structure of the floor plates while acting as formwork for the concrete infill that provides the final strength to the core system.

"We could erect steel as much as eight floors ahead of where concrete was going into the core panels and as much as 12 floors ahead of where concrete was going in on the floor decks," says Klemencic. This efficiency shaved nearly 10 months from the construction schedule but put other demands on NBBJ's architects for coordination. A scale mock-up of the system in Seattle helped the team resolve issues well ahead of construction. "Working out the core penetrations in advance was a high priority," Klemencic says, admitting the speed core does not readily allow for field changes such as a surprise pipe or conduit routing.

Given that the core is also the central life-safety egress feature of a high-rise, fire performance was a critical issue. Instead of arguing the case against added fireproofing to the exposed steel plates on the outer face of the core, the architects concealed a sprayed fireproofing material within a conventional furred gyp-board wall. This also hid the protruding rods from the panels, so the architects provided a furred gyp-board wall finish inside the core too. Subsequent testing at Purdue has demonstrated that the speed core performs safely without added fireproofing, a strategy that Klemencic is now implementing on a new project in development in California.

THE DESIGN TEAM wanted to ensure that the building—Seattle's second-tallest—works both as part of the skyline and as part of the street.

would need to work at several scales: as viewed from a distance and by pedestrians engaging with it at ground level. The podium incorporates wide expanses of glazing along the street, connecting retail tenants, like a food cooperative, to passersby who would be potential customers. Taking cues from Yamasaki's metal-and-glass curtain wall, NBBJ developed the tower's glass curtain wall system, interspersed with 2-foot-wide insulated aluminum panels finished with a shimmery mica paint, which protrude from the facade. The panels provide a repeating element that glimmers across the tower's mass from afar, while defining a scale and texture to those at street level. The same panels enclose the mechanical floors at the top of the building, creating a "cuff" element also found in the two adjacent Yamasaki buildings.

The design team employed shadow studies and curtain wall mock-ups to refine the geometry of the panels, so they could act as prisms, creating shadows on each elevation. Each of three types of panels were also rotated 180 degrees to ultimately result in six unique geometries. To create the building's signature swoop, glazed panels connect at the level of the ceiling of one floor and step back in an angle to the sill of the floor above—in effect, a sloped spandrel condition. The residential curtain wall matches that of the office floors but incorporates operable windows, for natural ventilation. At one corner of the site, the architects carved out a glazed scoop to add definition to the street-level retail.

The tower's structure consists of steel, with an innovative core design that integrates prefabricated steel panels with on-site concrete work. Developed by Magnusson Klemencic Associates (MKA), the project's structural engineers, the so-called "speed core" design reduced construction time significantly (see sidebar, opposite). Given the tower's height, wind load played a bigger part in the structural criteria than the site's seismic hazard.

Ron Klemencic, chairman and CEO of MKA, and his team addressed wind loads by installing tuned liquid mass dampers at the top floor mechanical room, which consist of two 6,000-gallon water tanks in concrete vaults. As the building sways in the wind, the water sloshes back and forth against baffles in each tank as a directional countermotion, effectively balancing the movement to achieve a range acceptable for human comfort. MKA addressed the majority of the wind loads with steel outrigger trusses, which extend 40 feet from the core at the 38th-level mechanical floor and connect to three outrigger box columns at both the north and south elevations. "The columns act like ski poles, and the outrigger trusses are like the arms of





the skier," says Klemencic. For now, the only thing skiing down the slopes of the building is its maintenance unit, which extends 155 feet from the roof for window washing.

Rainier Square represents a leap in skyscraper evolution for Seattle, fulfilling the varied programmatic demands in an aesthetically unified and elegant tower that celebrates the rich architectural heritage of Yamasaki's nearby originals. ■

Russell Fortmeyer leads the sustainability group for Arup's Los Angeles office.

Credits

ARCHITECT: NBBJ — Mindy Levine-Archer, partner in charge; John Thomas, principal/project manager; John Lemr, Peter Alderson, project architects; Brian Domini, project architect/designer

CONSULTANTS: Magnusson Klemencic Associates (structural/civil); MacDonald-Miller Facility Solutions (mechanical/plumbing); Prime Electric, Gerber Engineering (electrical); Gustafson Guthrie Nichol (landscape)

GENERAL CONTRACTOR: Lease Crutcher Lewis, Turner Construction (apartments)

CLIENT: Wright Runstad & Company

OWNER: RSQ Tower

SIZE: 1.3 million square feet

COST: withheld

COMPLETION DATE: 2021

Sources

PODIUM METAL PANELS: Custom Metal Contracting

CURTAIN WALL: Walters & Wolf

STRUCTURAL GLASS SYSTEM: Sentech Architectural Systems

PODIUM STOREFRONT SYSTEM: Herzog Glass

GLAZING: Viracon, Guardian, DeaMor (canopies)

INTERIOR FINISHES: Armstrong, Sherwin-Williams, Benjamin Moore, Daltile, Casa Dolce Casa, United Tile

CONVEYANCE: Otis



THE OFFICE TOWER'S main entrance level connects to a larger public lobby via escalators, elevators, and stairs (top). The speed core's protruding steel rods form a textured surface in the office tower's elevator lobby (above).

On the Rise

A selection of projects in progress from around the world provides a glimpse of what's next for the skyscraper.

BY LAURA RASKIN





◀ **Una Residences** **Adrian Smith and Gordon Gill**, architects of some of the world's tallest buildings, are lowering the height but not their sights with Una, in Miami's Brickell neighborhood. The 47-story waterfront residential tower is Brickell's first in over a decade, slated for completion in 2023. The architects have designed the interiors as well as the exterior, inspired by the curves and opulent materials of classic yacht design. "It stands contrapposto, where one side of the building is holding its full weight and the other side is relaxed, looking at you. I like that attitude," said Gill in a press statement.

▶ **The Nexus** Work on the Nexus, in China's Pearl River Delta, designed by London-based **PLP Architecture**, is paused, but the hope is that it will resume soon. The 1,969-foot-tall 124-story office and hotel tower (at far right in photo)—part of a complex of four PLP buildings in Guangzhou's central business district—consists of three slab volumes of different heights, balanced on top of each other. The lower volume responds to the park nearby; the middle zone faces the urban context; and the upper component, perched dramatically askew, is oriented to the mountains beyond the city.



IMAGES: © OKO GROUP/CAIN INTERNATIONAL (TOP 2); LUXIGON (BOTTOM)



▲ **Valley** The three "peaks" of **MVRDV**'s mixed-use Valley in Amsterdam look as if they were carved out of a mountain of glass, stone, and steel. Topping out at 338 feet in December 2020, Valley should be completed by the end of this year. Containing retail, offices, and apartments, it has a pedestrian path that winds around the exterior of the central tower, while the buildings' inner facade features craggy terraces and gardens (right) by Piet Oudoulf.





◀ **Merdeka 118** As of this March, the concrete core of this 118-story tower in Kuala Lumpur, Malaysia, had reached its peak, and the diamond-shaped, faceted glass facade was completed to level 101. Designed by Melbourne-based architect Karl Fender of **Fender Katsalidis**, Merdeka 118 will be the world's second-tallest tower at 2,113 feet, behind Dubai's Burj Khalifa (2,717 feet) and will surpass fellow city resident's Petronas Towers by Cesar Pelli (1,483 feet). Arup, which has led the structural, civil, and geotechnical engineering, conceived three multistory-deep outrigger zones to achieve structural stiffness with high resistance to wind loads.



◀ **Ascent** For perhaps one hot minute, this 25-story residential building in downtown Milwaukee will be the tallest mass-timber tower in the world when it is completed in 2022. Wood structures have been on the rise for several years, due in part to new technology that uses cross-laminated timber (CLT) and glulam to create fire- and earthquake-resistant structures that store carbon and can be prefabricated off-site, slashing construction time. Designed by **Korb + Associates Architects**, with structural engineering by Thornton Tomasetti, the base, elevator core, and stair shafts of the 259-unit building will be concrete.

IMAGES: © MARCEL STEINBACH (TOP, LEFT); VERO VISUALS (TOP, RIGHT); FENDER KATSALIDIS (BOTTOM, LEFT); KORB ASSOCIATES (BOTTOM, RIGHT)

▶ **DeKalb** At 1,066 feet, **SHoP Architects**' 9 DeKalb will be Brooklyn's tallest building when it is completed in 2023. The residential supertall will reach 73 stories, containing 425 rental apartments and 150 condominiums. The hexagonal glass tower, which tapers as it reaches skyward, is clad in repeating vertical architectural profiles made of bronze, creating a gothic look that complements the Brooklyn Dime Savings Bank, an adjoining landmark of the City Beautiful era. SHoP is also restoring the bank as part of a new midblock connection for pedestrians between busy Flatbush Avenue and Fulton Street.





▲ **Autograph Tower** When completed later this year, the 1,256-foot-tall Autograph Tower, designed by Kohn Pedersen Fox (KPF), will be Jakarta's first supertall, and the tallest building in the Southern hemisphere. Located in a mixed-use development between Old City and the central business district, the Autograph features offices, apartments, and a hotel. It shares a podium with the KPF-designed Luminary tower (to the right in photo), slated to be operational in 2022. Both buildings have pinwheeling glass planes and observation decks.





▲ **Jeddah Tower** With the Jeddah Tower in Saudi Arabia (formerly known as the Kingdom Tower), Adrian Smith of **Adrian Smith and Gordon Gill Architecture** was set to steal the crown for designing the world's tallest building—from himself. Smith was in charge of the current record holder, the 2,717-foot-tall Burj Khalifa, in Dubai, while a partner at SOM. But construction of the 3,280-foot-tall Jeddah project stalled in 2018, at about 60 stories. In a talk hosted by the Skyscraper Museum in early March, Smith said the pandemic caused another setback. "We hope it gets going. We've been told it is going to happen. It is just a matter of time and circumstances," he said.

IMAGES: COURTESY SHOP ARCHITECTS/JDS DEVELOPMENT (TOP LEFT); © LEMONS BUCKET (TOP RIGHT); ADRIAN SMITH + GORDON GILL ARCHITECTURE (BOTTOM, LEFT); WIKIMEDIA COMMONS (BOTTOM, RIGHT)

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To earn one AIA learning unit (LU), including one hour of health, safety, and welfare (HSW) credit, read the "Tall Buildings" section on pages 61–99 and then complete the quiz at continuingeducation.bnpmedia.com. Upon passing the test, you will receive a certificate of completion, and your credit will be automatically reported to the AIA. Additional information regarding credit-reporting and continuing-education requirements can be found at continuingeducation.bnpmedia.com.

Learning Objectives

1 Outline different strategies for resisting wind and seismic loads in tall buildings.

2 Describe ways tall buildings can make use of challenging sites, including those near elevated roadways and over train tracks, and discuss the urbanistic and structural ramifications.

3 Explain how nonstandard geometries can be used to control heat gain while maximizing views and daylighting in tall buildings.

4 Describe a novel time-saving method for constructing a tall building's structural core.

AIA/CES Course #K2105A

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MAY 6, 2021 | 2:00 PM EDT

Sustainable Design Through Daylighting

CREDITS: 1 AIA LU/HSW; 1 AIBD P-CE; 0.1 IACET CEU

Topics discussed include daylighting strategies available through the integration of structural sandwich panels, energy conservation, enhancements, options, form and aesthetics. The many benefits to health, productivity, safety and sustainable design will be discussed, as well as specialty applications including explosion venting, blast resistance, OSHA fall through protection and hurricane resistance.



Michael Crowder
National Sales
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MAY 18, 2021 | 2:00 PM EDT

Built to Last

CREDITS: 1 AIA LU/ELECTIVE; 1 AIBD P-CE; 0.1 IACET CEU

Known for their desirable wood-emulating aesthetic, PVC and composite deck boards have become popular building materials for outdoor living spaces because of their ability to withstand harsh climates and heavy foot traffic. This course will focus on how design professionals can utilize these durable deck boards as compelling alternatives to wood cladding in the design of high-performance, low-maintenance modern rainscreen systems. It will introduce bamboo-based composite and PVC offerings and how to specify them to improve on-the-wall fade- and weather-resistance. Lastly, the course will provide strategies for using these boards to deliver a contemporary aesthetic and low cost of ownership.



William H. Ross Jr.
Director, Composite Category
Fortress Building Products

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MAY 19, 2021 | 2:00 PM EDT

Fire-Rated Glass Doors 101

CREDITS: 1 AIA LU/HSW; 1 AIBD P-CE; 0.1 IACET CEU

This course examines fire-rated glass doors systems and how they can safeguard areas of egress while supporting a wide range of design goals. Learn the basics of fire-rated glass door specification, building code standards and critical life safety considerations. Then, explore how today's fire-rated glass doors are more than code-driven assemblies with their ability to preserve sightlines, adhere to the aesthetic design intent and integrate within sophisticated fire-rated storefronts and curtain wall systems. Additionally, learn how new-to-market multifunctional fire-rated glass door systems combine critical functions in one integrated product, mitigating additional safety and security threats without compromising fire protection.



Zach Passman
Territory Account Manager
Technical Glass Products

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LIGHTING

A Welcome Glow

Newly renovated, a commercial lobby and a health-care facility entrance each engage passersby and occupants with bold, illuminating schemes.

104 **Franklin Square Lobby**
WASHINGTON, D.C.

106 **Oculum**
MADRID

108 **Lighting Products**



THE FRANKLIN SQUARE LOBBY, RENOVATED BY HICKOK COLE.

PHOTOGRAPHY: © GARRETT ROWLAND



Franklin Square

Hickok Cole

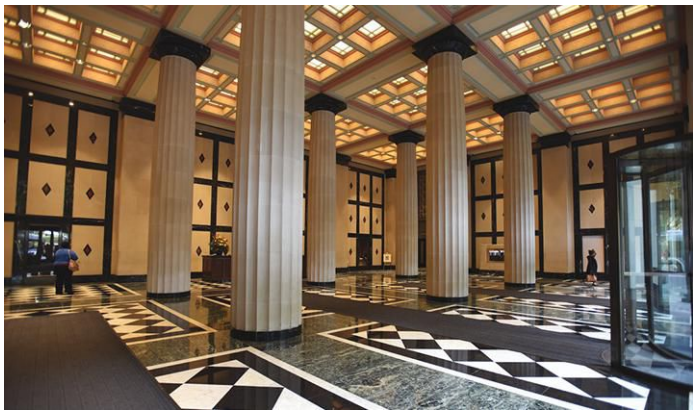
Patricia Kazinski and GPI Design

BY DAVID SOKOL

IN AN AGE of flat business organization and collaborative work environments, the imposing office lobbies of 1980s-era Washington, D.C., feel as dated as big hair. At 1300 Eye Street NW, known as Franklin Square, Hickok Cole transformed the ultimate power-broker lobby into a front door for our time. The existing 22-foot fluted columns, coffered ceiling, and shiny marble floor that could have been extracted from a John Grisham thriller were in fact conceived by Philip Johnson when he designed the 1989 Postmodern building. As Hickok Cole principal Rob Holzbach describes the recent renovation, "The lobby is liberated from its previous inward-facing intensity and now reorients itself to the streetscape."

Johnson had inset the building's double-height entrance under the third-story floorplate and crowned four bays of doors in grillwork, alternating the bays with as many canopies over the sidewalk. To better integrate Franklin Square into the urban fabric, Hickok Cole undid the original portal-like experience by replacing the bronze grillwork with a custom glass wall system aligned to the third floor's edge. The strategy shifts the entrance nearer to the city's foot traffic and maximizes sight lines between occupants and passersby. It also increases daylight in the interior, where the marble floors are newly honed to reduce glare.

Working with the late Washington, D.C.–based lighting consultant Patricia Kazinski and Westlake, Ohio–based engineer-build firm GPI



The lobby's existing coffered ceiling (above) was replaced by 105-foot-long LED light "ribbons" (top). The ½-inch-thick diffusion-layer glass features satin etching on both faces for diffusion and glare reduction.

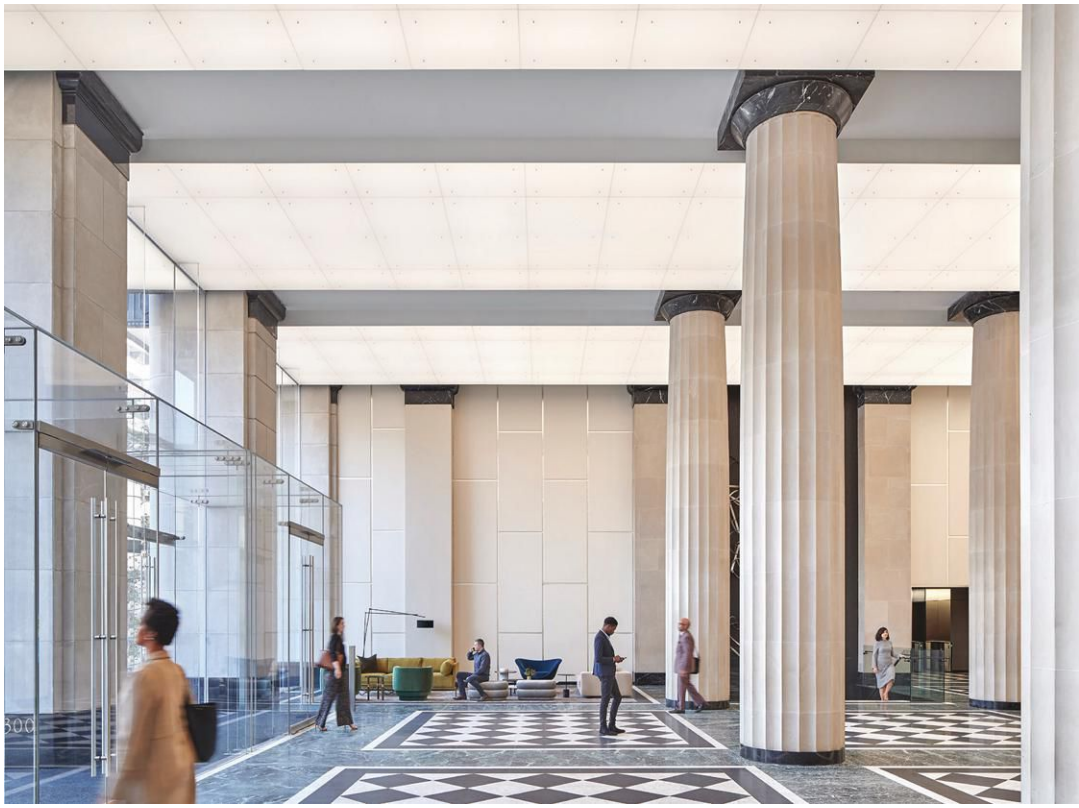
Design, Hickok Cole also harnessed electric illumination to connect lobby and street by running four 105-foot-long by 14-foot-wide "ribbons" of 3500-Kelvin light from the canopy undersides to the lobby's rear.

That solution replaced the myriad coffers overlooking Johnson's entrance. Hickok Cole senior associate Bertin Radifera recalls that swapping coffers for ribbons "was an easy decision. The original grid was a little fussy, and the high hats installed behind the coffers didn't properly light the space." To achieve uniform illumination, the designers specified LED sheets with a typical diode spacing of 1 inch on center, and placed these in a precisely calculated airspace behind a ½-inch-thick diffusion-layer of glass with satin etching. The sheets

have different orientations, based on their location within the ribbon, so that the glass surface is lit from edge to edge without hot spots. Additional LED strings were placed within the assembly, where necessary, to eliminate shadows.

The ribbons are powered by the ceiling's existing energy source, but the project team had to place coordinating controls and drivers within reach of building managers. Electrical-supply panels hidden within each side of the lobby provide that access. The entire system is DMX-controlled and dimmable per panel, and lighting intensity cycles through a series of preset scenes during the day. Manual and sensor-triggered overrides adjust brightness according to daylight availability.

In addition to making an urbanistic statement to the surrounding neighborhood, the ribbons draw Washingtonians into Franklin Square, where they will find that Hickok Cole's modernization stretches over 31,000 square feet of now-public interiors. The effort introduces new functions to an expanded lobby area, most notably lounge seating, a café, and lower-concourse-level conference facilities. Architectural gestures correspond to the programming changes: two new slab openings foster visual connections between the lobby and downstairs, for instance, and cove-washed pillars in that concourse appear as if extruded from Philip Johnson's towering columns overhead. What was once a corporate fortress now feels more like a city within the nation's capital. ■





Leather panels over the lobby's marble walls lend warmth and acoustical dampening to the previously hard-edged space, while disguising the new power supply panels (top). Cove-lit piers on the concourse (above) mimic Johnson's fluted columns and appear to extend through the floor.

Credits

ARCHITECT: Hikok Cole — Robert Holzback, principal in charge; Mercedes Afshar, senior project designer; Bertin Radifera, senior project manager; Andrew Bickell, project architect; Rhea Vaflor, lifestyle director

ENGINEERS: Structura (structural); Greenman-Pedersen (m/e/p)

GENERAL CONTRACTOR: Harvey-Cleary Builders

CONSULTANTS: Patricia Kazinski; GPI Design (lighting); Arup (code); Jaffe Holden (acoustics)

CLIENT: Nuveen Real Estate/Hines

SIZE: 31,000 square feet

COST: $18 million

COMPLETION DATE: October 2020

Sources

CURTAIN WALL: WalTek

GLASS: CladTek (structural); Tvitec; Pilkington

LIGHTING: Focal Point; Tivoli; Gotham Lighting; Lithonia; Finelite; Lukas Lighting; Precise LED; Moooi; Sattler; Lutron (controls)

PHOTOGRAPHY: © GARRETT ROWLAND



OCULUM

gon architects

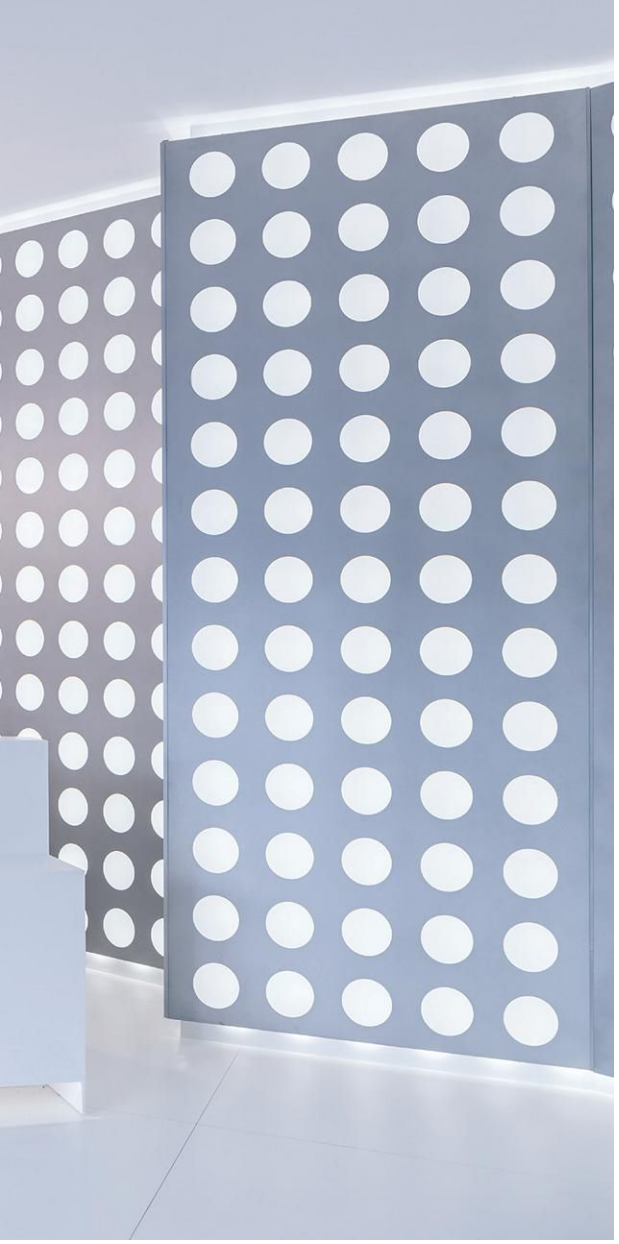
Oliva Iluminación

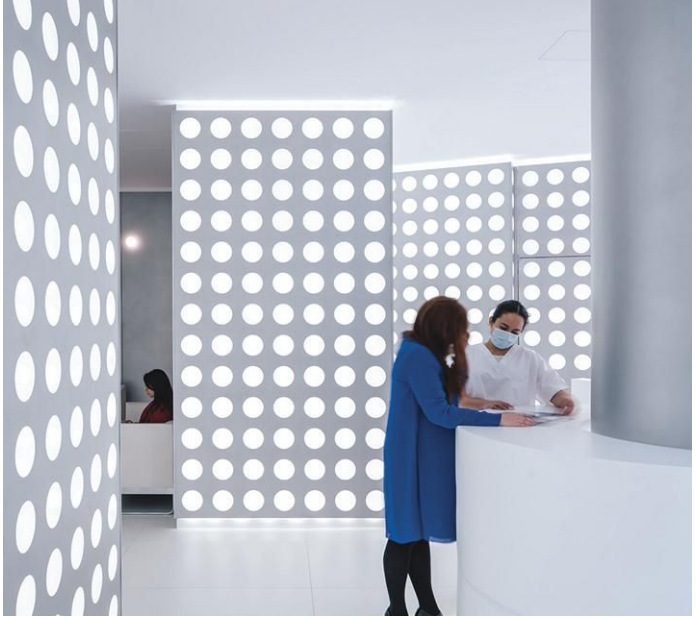
BY ANATXU ZABALBEASCOA

IT MIGHT seem antithetical to common practice that lighting would be used to announce, indeed summarize, the competence, skills, and technological precision of a private ophthalmology clinic. But, in their redesign for a lobby at the Institute of Ocular Microsurgery (IMO) in Madrid, local firm gon architects employed a strategy of illumination for the street-level reception-cum-waiting area of the facility's 2010 building that is strong yet surprisingly tranquil. Rather than dazzling patients as they enter, the architects' scheme manages to welcome them with visual comfort. This is because, once inside, one no longer sees the light, one senses it.

Dubbed OCULUM ("eye" in Latin), the newly remodeled lobby is not just a space but an architectural device featuring a wraparound wall or enclosure system built with 17 metallic light boxes that rise from floor to ceiling. Referencing Jean Prouve's Maisons Tropicales (1949–51)—a trio of Modernist prefabricated aluminum-and-steel prototype houses with glazed portholes—this assembly functions as a lantern and comprises 1,184 methacrylate lenses that cover a series of circular holes die-cut from the thin aluminum panels cladding the light boxes around the room. Inside these modules, which are lacquered in a tactile, textured gray finish, a hidden circuit of tunable-white LEDs provides a soft, dimmed light that magnifies the space and makes it feel both expansive and calm. This effect is underscored by the discreet glow of a continuous LED ribbon that frames the walls from within coves around the floor and ceiling, so that they appear to float. A white floor, made of 4-foot-square porcelain tiles, and a white ceiling add to the brightness and fluidity of the space, which is never broken but rather reinforced by the spare, pristine solid-surface reception desk and bench. The latter conceals a column facing the entrance and morphs into a high table as it sweeps around to the back, adding sinuousity.

Designed in collaboration with the lighting designers at Oliva Iluminación and fabricated by blacksmith Alberto Iglesias, the panel structures establish a homogeneous state at a Unified Glare Rating (UGR) that never exceeds 19, a level approved by the doctors at the clinic. The color temperature ranges between 3000K and 6000K and is controlled to follow the patterns of the sun. The result is a system





Graphic LED-encased lightboxes, delineated by illuminated coves, serve as walls in the street-level reception area of Madrid's Institute of Ocular Microsurgery (all photos). A central column anchors a circular solid-surface bench that doubles as a counter-height work surface (left and right).



that fluctuates gently, reproducing the quality of the daylight in accordance with the seasons and hour to accord with the circadian rhythm of building occupants.

Despite the clear reference to Prouvé found in the pattern of the paneled light walls, this bold project is also about the invisible—it tells a story of inventiveness that relates manufacturing to craft, as the Modern movement did. The lobby seems extremely technological, and yet it is handcrafted. No light source is clearly visible, but what you perceive is welcoming, soothing light. ■

Credits

ARCHITECT: gon architects — Gonzalo Pardo, founding principal; Carol Pierina, María Cecilia Cordero, design team; Iván Rando, drawings

ENGINEER: 13 Ingenieros (installations)

GENERAL CONTRACTOR: Ancordarq

CONSULTANTS: Oliva Iluminación (lighting design)

CLIENT: Institute of Microcirugía Ocular

OWNER: MIRANZA Group

SIZE: 1,100 square feet

COST: $141,000

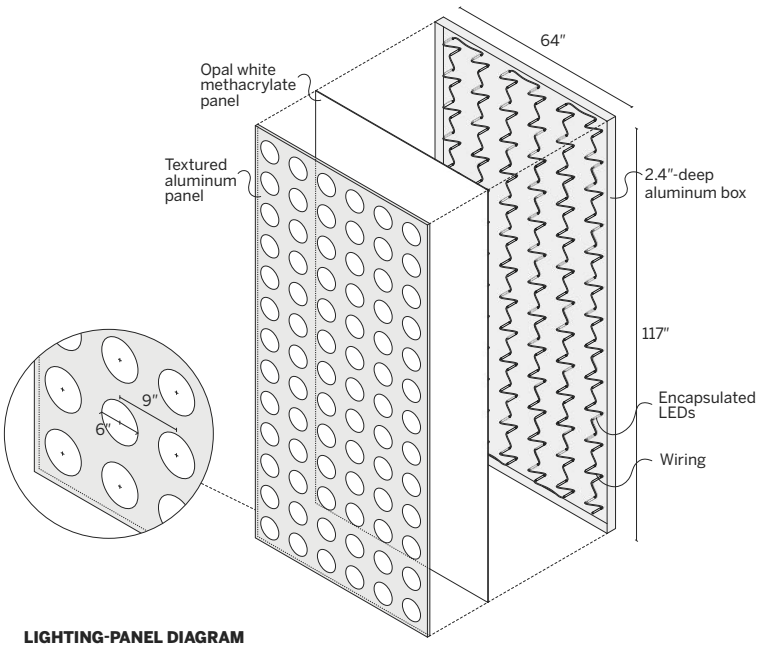
COMPLETION DATE: December 2020

SOURCES

LIGHTING: XAL (pendant); JUNG (controls)

TILE: Porcelanosa (floor and wall)

SOLID SURFACE: Abalit Elementos Moldeados



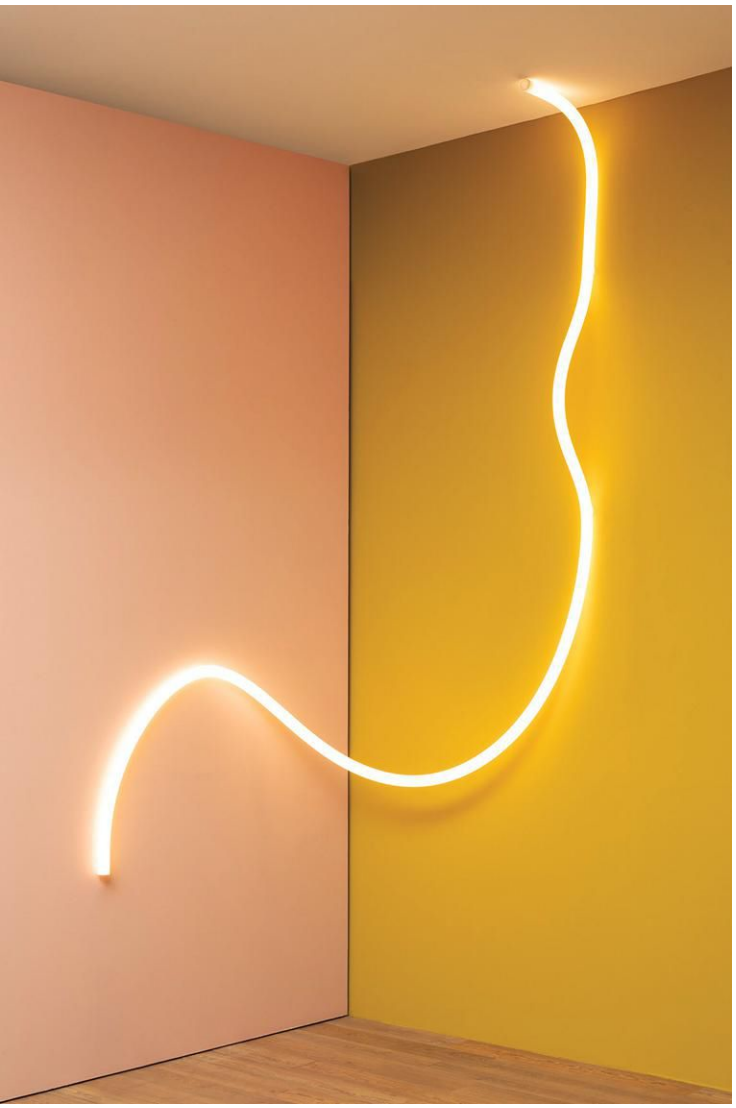
LIGHTING-PANEL DIAGRAM

PHOTOGRAPHY: © IMAGEN SUBLIMINAL (MIGUEL DE GUZMÁN + ROCÍO ROMERO)

Spring Illuminati

The season moves forward with new luminaire designs that emphasize softness, subtlety, or nature.

BY SHEILA KIM



La Linea

Designed by architecture firm BIG–Bjarke Ingels Group, this flexible linear luminaire from Artemide is now available in North America. The white silicone tubes, applicable to both walls and ceilings, measure 1½" in diameter and come in 8¼' and 16½' lengths. The white LEDs have a 3000-Kelvin color temperature.
artemide.com



Coil Collection Naturals

LightArt has expanded its Coil pendant collection—which is 3-D-printed using the manufacturer's own upcycled plastic waste—with new shapes, larger sizes, and timely matte-finish colors such as terra-cotta, linen, and concrete. Like the original collection, these pendants feature the same convincing hand-turned-ceramic look.
lightart.com

Aile

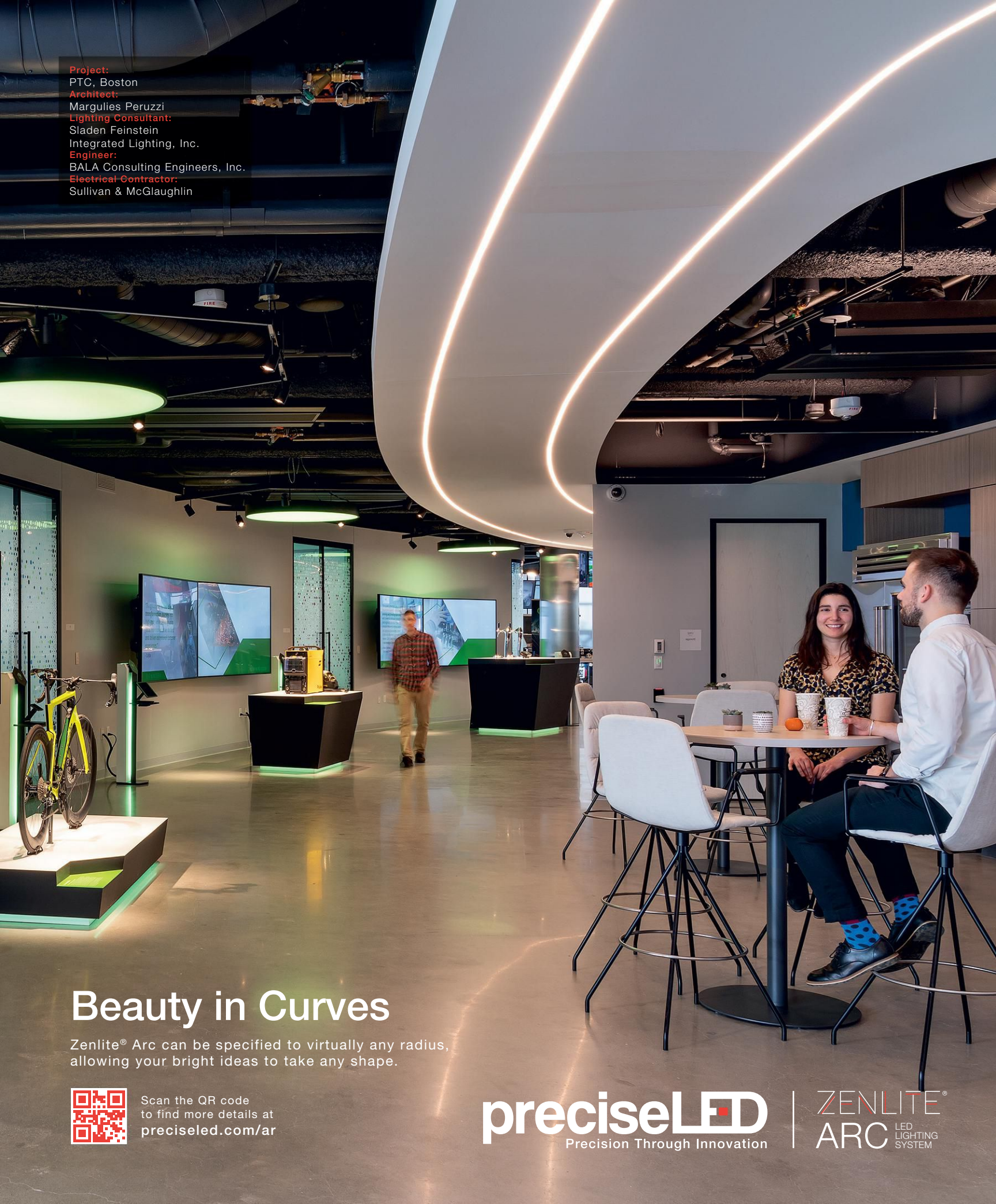
Designed by Luca Nichetto for Lodes, this wall sconce draws on the sleek form of a sports car aileron (aka "aerodynamic spoiler"). The slim die-cast aluminum sconce folds upward and frames the aperture, resulting in an uplight that bounces off the wall to cast a glow downward. Containing a pair of 9W 2700 or 3000K LEDs, Aile is available in black, white, matte champagne, and lacquer red.
lodes.com





Torrey

Part of a new architectural-lighting collection by Cerno, this pendant comprises a 30"-diameter spun-aluminum shade and a diffusing disc that seems to float at the shade's center. The shade is offered in five exterior and four interior finishes, while the diffuser is available in a choice of three wood, two powder-coat, or three metallic finishes.
cernogroup.com



Project:
PTC, Boston
Architect:
Margulies Peruzzi
Lighting Consultant:
Sladen Feinstein
Integrated Lighting, Inc.
Engineer:
BALA Consulting Engineers, Inc.
Electrical Contractor:
Sullivan & McGlaughlin

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STELLR Pendant

Following up on its STELLR ceiling luminaires, Lucifer Lighting has applied the same design and technology to a pendant. Like the original, this new fixture provides independently controlled sources for directional downlighting and ambient illumination; the light sources can be synchronized to transform the clear glass diffuser into a translucent one.
luciferlighting.com



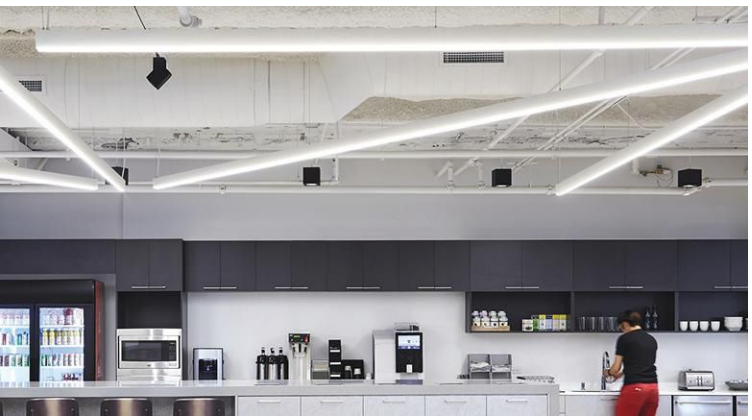
NatureConnect

After a year of quarantine, biophilic design in the workplace will be more important than ever. Signify's answer is NatureConnect, a triple-component lighting system that combines tunable-white LED panels, faux skylights, and a wall-washer to simulate the sun's course in real time, supporting human circadian rhythms.
signify.com

Plint

The minimal form of Nemo's Plint diverges from the typical spotlight, instead presenting a discreet spotlight concealed by two lateral panels. The beam can be adjusted vertically up to 90°. Plint is composed of aluminum finished in black.
nemolighting.com





Non-UV Antimicrobial Lighting

Amerlux has newly incorporated a non-UV antimicrobial light, by health-tech company Vyv, into its existing product offering. Utilizing a spectrum composed of visible light, this proprietary technology works around the clock to fight off microorganisms by inhibiting their growth, destroying the microbes.
amerlux.com



Flindt Plaza

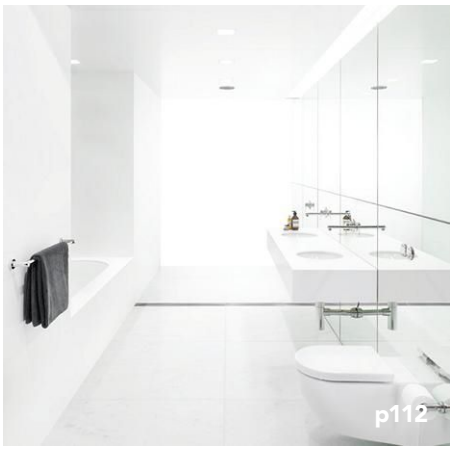
Christian Flindt's eponymous collection for Louis Poulsen has new models including this post-top design for large outdoor spaces. The top is a sculptural module that—whether installed as a single unit (near left) or stacked (far left)—can be fixed atop posts of varying heights. Available in aluminum or Cor-Ten finish, each module features an asymmetrical aperture that softens the downlight.
louispoulsen.com

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Photo courtesy of Infinity Drain



The Many Benefits of Barrier-Free Showers

Sponsored by Infinity Drain

CREDIT: 1 AIA LU/HSW

ACC | LS | PM

Photo courtesy of Tamlyn



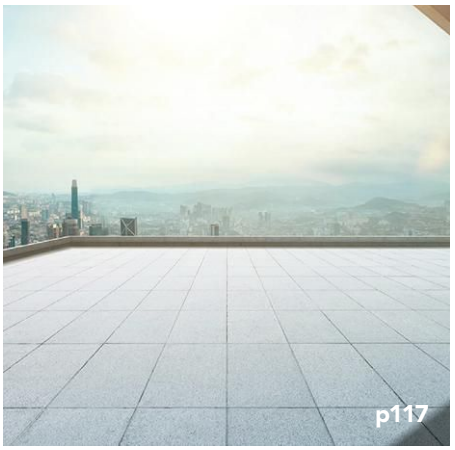
Extruded Aluminum Shines in Multifamily and Commercial Building Projects

Sponsored by Tamlyn

CREDIT: 1 AIA LU/ELECTIVE

IN | PM | RE

Photo: jamesteohart/Adobe Stock



The Top 10 Ways to Reduce Concrete's Carbon Footprint

Sponsored by Build with Strength, a coalition of the National Ready Mixed Concrete Association

CREDIT: 1 AIA LU/HSW

LS | PM | ST | SU

Photo courtesy of Watts



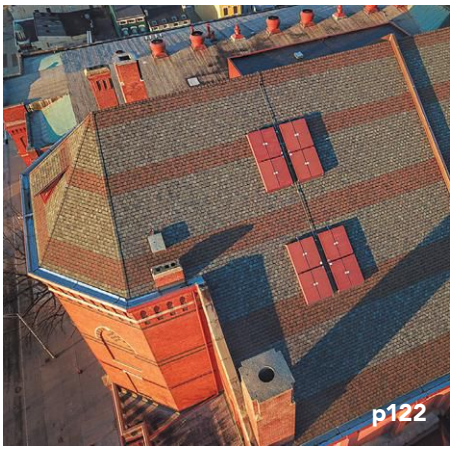
Optimizing Snow-Melting Systems

Sponsored by Watts

CREDIT: 1 AIA LU/HSW

EM | PM | SI

Photo courtesy of Imbus Roofing



Fighting Fires and Saving Lives in Large, Single-Story, Undivided Buildings

Sponsored by The BILCO Company

CREDIT: 1 AIA LU/HSW

BE | LS | PM

CATEGORIES

- **ACC** ACCESSIBILITY
- **BE** BUILDING ENVELOPE DESIGN
- **EM** ELECTRICAL AND MECHANICAL
- **IN** INTERIORS
- **LS** LIFE SAFETY AND CODES
- **PM** PRODUCTS AND MATERIALS
- **RE** RESIDENTIAL
- **SI** SITE INFRASTRUCTURE DESIGN
- **SU** SUSTAINABILITY
- **ST** STRUCTURAL

Courses may qualify for learning hours through most Canadian provincial architectural associations.

The Many Benefits of Barrier-Free Showers

Explore the nuances of and best practices for creating these trending shower spaces

Sponsored by Infinity Drain



All images courtesy of Infinity Drain

Barrier-free showers designed with a linear drain and single-slope floor pitch create modern and luxurious bathroom spaces that are more accessible and look larger.

Barrier-free bathrooms have been recognized as top bathroom design trends in both 2020 and 2021, and blogs galore in the design and construction industry tout their popularity. Some design trends start because there is a unique need in the market and then catch fire because the new solution is better in so many ways. The rise of the barrier-free shower is a perfect example of this phenomenon. First developed to accommodate the growing interest in aging in place spurred by Baby Boomers, barrier-free showers are now considered the next level in beautiful, luxurious interiors.

This course will take a closer look at the benefits that this aging-friendly and now trending solution can bring to a bathroom, and a few important best practices that will help avoid some of the challenges that can arise during construction.

INTRODUCING AN ACCESSIBLE BARRIER-FREE SHOWER

The barrier-free shower, also referred to as the walk-in shower, zero-threshold shower, or curbless shower, is a growing trend in bathroom design. The distinguishing feature of this type of shower is that there is no obstacle at the threshold to step or roll over. Barrier-free bathroom design is often achieved with the use of a linear drain system and a single-slope floor pitch.

CONTINUING EDUCATION

AIA Continuing Education Provider **1 AIA LU/HSW**

Learning Objectives

After reading this article, you should be able to:

1. Describe the connection between barrier-free showers and the design objectives of aging in place or living in place.
2. Explain how barrier-free shower spaces comply with the Americans with Disabilities Act (ADA) design standards.
3. Identify the basic elements and considerations for incorporating this more accessible barrier-free shower into a new construction or renovation project.
4. Specify the right linear drain system for any given project.

To receive AIA credit, you are required to read the entire article and pass the quiz. Visit **ce.architecturalrecord.com** for the complete text and to take the quiz for free.

AIA COURSE #K2105G

A linear drain is a channel or trench that is built into the floor of the shower. It collects the water and delivers it to the drain outlet, which can be located anywhere along the channel length. With the floor sloped in one direction, the water is aided by gravity and rushes to the far edge of the space, where it is then easily processed.

This barrier-free design offers several benefits over the traditional shower-in-tub and bowl-shaped shower floor with a center drain. These include a more accessible bathroom for people of all ages and capabilities, the removal of a trip hazard, a better overall shower experience, and a shower space that looks larger and is easier to clean.

Beautiful, Bigger-Looking Bathrooms

The barrier-free shower trend may have started to deliver a more accessible type of shower area that made it easier for people to live in place, but it has evolved into an in-demand bathroom feature that allows these spaces to achieve a modern and luxurious aesthetic, while also being more accessible. Architects are finding that these barrier-free bathrooms enable them to use materials that did not fit into a conventional shower-with-a-center-drain solution, and the removal of physical boundaries at the shower eliminate the compartmentalization that before made the bathroom space feel smaller and broken up.

The move from a shower compartment with a standard central drain to a barrier-free shower with a linear drain affects the type of flooring that can be specified in the bathroom. The barrier-free solution offers architects the opportunity to use higher-end materials often found in ultra-modern interiors and five-star spas.

Here is why: When the shower flooring material must accommodate a central drain and four-way pitch, architects will often specify smaller tile or cut large-format tile on a diagonal and then piece it together around the drain. When the shower floor slopes uniformly in one direction, as it does in a barrier-free application, the limitations on tile size and slab material are eliminated. Large-format tiles, stone slabs, or any solid-surface material can be used without being compromised or broken down into smaller pieces.

Barrier-free bathrooms also look bigger, and in real estate, bigger is always better. Instead of having a bathroom broken up into distinct areas, the barrier-free shower creates a seamless transition between the shower space and the rest of the bathroom. This makes the entire bathroom feel larger, even through the total square footage of the space has not changed.

Enhanced Accessibility

Barrier-free showers are more accessible and uphold many of the universal design tenets that ensure products and spaces can be used by as many people as possible. With no curb or barrier obstructing the entrance to the shower, a barrier-free shower offers the most accessible solution for people of all ages, sizes, and physical abilities.

As evidence of this enhanced accessibility, the Americans with Disabilities Act (ADA) design standards specify three types of ADA-compliant shower enclosures. They are a transfer-type shower compartment, a standard roll-in shower compartment, and an alternate roll-in shower compartment. Only one of these ADA-compliant compartments, the transfer type, can have a curb at the enclosure threshold. Any curb or edge in the two roll-in shower compartments must be no taller than a ½ inch and beveled to make it easier to roll over. Designing a barrier-free shower enclosure would certainly satisfy the limited curb requirements of an ADA-compliant shower compartment.

The ADA also sets minimum guidelines for the size of compliant shower enclosures. The transfer-type shower compartment requires a minimum clearance of 36 inches wide by 36 inches deep. The two roll-in type compartments, which allow for a person to fully roll a wheelchair into the shower area, require a minimum clearance of 60 inches wide and 36 inches deep.

Please note that these measurements are absolute minimums. Larger spaces increase maneuverability and make bathing easier. A barrier-free shower enclosure can be created in any size, enabling architects to realize their design intents in these special spaces.

Continues at ce.architecturalrecord.com



The ADA design standards mandate that roll-in shower compartments shall not have any curbs or edges taller than ½ inch.

ID Infinity Drain

Infinity Drain is the leader in design-centric decorative shower drains. Proudly made in the United States, its current product portfolio features the broadest selection of decorative choices and innovative installation options for both indoor and outdoor applications. For additional information, please visit **www.infinitydrain.com**.

All photos courtesy of Tamlyn



Aluminum lasts a long time before it needs to be replaced, and its lightweight quality and ability to be recycled make it an ideal green building material.

Extruded Aluminum Shines in Multifamily and Commercial Building Projects

Advances in extruded aluminum lead to design flexibility, lower costs and less lead times, pandemic solutions, and sustainability

Sponsored by Tamlyn | *By Erika Fredrickson*

Extruded aluminum is unlike many other building materials because it does not need to fit standard profiles. It can be shaped to fit the design and structural needs of a given project, and this flexibility is beneficial for multifamily and commercial properties. The popular material provides high-quality practical shapes, forms, and profiles that have the appearance of fine metal craft and can be easily integrated into other surfaces for significantly less than custom metal work. Its clean appearance works well with modern designs.

CONTINUING EDUCATION

AIA Continuing Education Provider **1 AIA LU/ELECTIVE**

Learning Objectives

After reading this article, you should be able to:

1. Describe the ways in which extruded aluminum is a versatile material that can be used in multiple products for multifamily and commercial projects.
2. Explain how extruded aluminum can lend itself to healthier buildings.
3. Review the expansive finish options and aesthetic capabilities for extruded aluminum.
4. Discuss how incorporating extruded aluminum into multifamily and commercial projects is a sustainable solution.

To receive AIA credit, you are required to read the entire article and pass the quiz. Visit **ce.architecturalrecord.com** for the complete text and to take the quiz for free.

AIA COURSE #K2105R

This section of the course will focus on the flexible design elements of aluminum, and why it is a good material for multifamily and commercial properties. It will discuss the design preferences of groups such as Baby Boomers and Millennials who often occupy multifamily residences, as well as the material's beneficial physical properties.

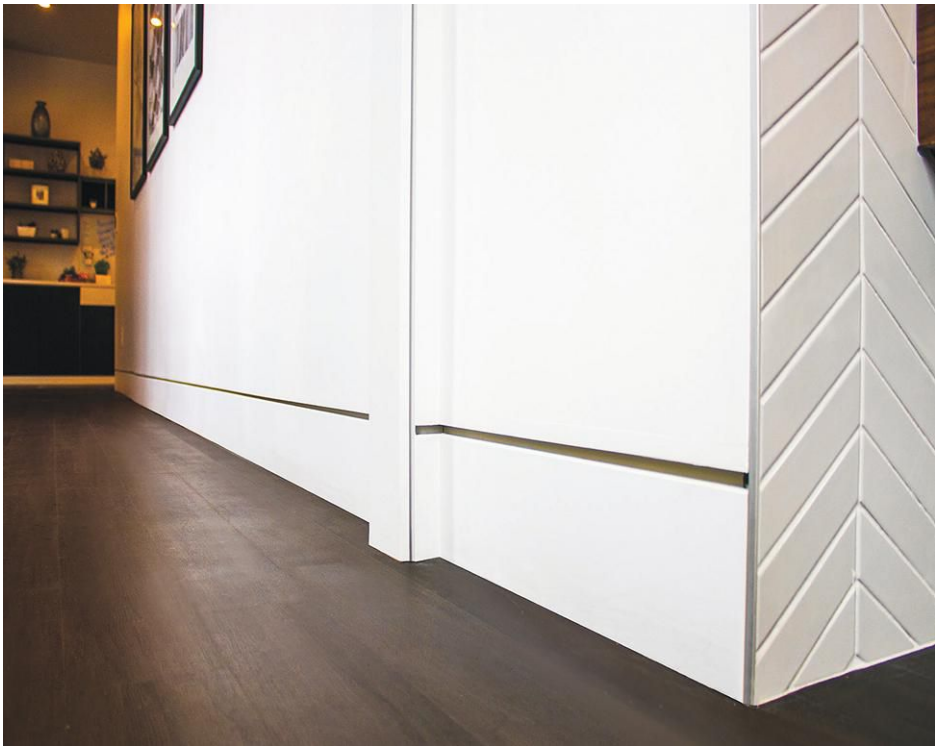
Modern Design Aesthetics in Multifamily Residential Properties

Before we go any deeper into the flexible characteristics of aluminum, it helps to get a better sense of how design trends have changed recently, with two key demographics moving into the multifamily residential market.

Baby Boomers and Millennials have had an impressive impact on multifamily residential properties, not only in terms of the features and amenities but also in the meaning of the space. Apartments and condominiums are no longer just places to live, but rather they reflect—and sometimes provide—aspects of the occupants' lifestyles. For example, new building projects may incorporate ways to promote community through shared indoor or outdoor spaces. And building occupants value their individual residential units as a way to highlight their unique style. Many developers are taking on a "resident-first" tactic to project design, and this approach includes elements of new modern design aesthetics.

One trend that lends itself well to extruded aluminum is mixed-material design. Millennials in particular tend to be happy to mix older, more rustic materials with sleek, modern styles. Aluminum is versatile enough that it can accomplish either look: a clear anodized finish, for example, can keep the natural metal look, while a custom-color powder coating can add a splash of color into a space of plain drywall.

Also worth considering is dwelling size. Baby Boomers are in a downsizing stage of life while Millennials tend to be minimalists, so both demographics benefit from creative techniques that can fit added design features into the structure of a space. Walls that look like they are floating or with deliberate shadow lines built in, for example, can add a unique look to a small apartment or condominium unit. This attention to detail makes a multifamily project stand out from other buildings and may help draw tenants. As we will see, the variety of aluminum profiles and finishes can play an important role in a design, while also keeping projects within a fixed income or renter budget.



When used for interior architectural purposes, aluminum trim can withstand daily use and long-term wear and tear better than most other materials.

What Is Extruded Aluminum?

Aluminum is the most abundant metal in the earth's crust. It is always found as a compound and often with bauxite ore, which contains around 30–60 percent aluminum oxide (known as alumina). Aluminum can be extracted from the bauxite and then smelted to form the aluminum metal that most people know. Because it is lightweight and durable, works in alloys, and is readily available through new extractions and recycled materials, aluminum is widely used in the transportation, packaging, and construction industries. It resists corrosion and is tolerant of high temperatures, making it ideal for commercial aircraft. It also is nontoxic and has low reactivity to light, water, and oxygen, which is ideal for food packaging as well as construction purposes—from windows and roofing to structural frames, gutters, and external and interior trim.

To get these versatile products, alumina first must undergo smelting and alloying. During this process, solid billets of cast metal are created, and these are later extruded through specialized forms to create the finished product. Following the extrusion process, the material is finished with anodizing or painting. The finishing process provides a range of colors, textures, and brightness to the aluminum.

Continues at ce.architecturalrecord.com

Erika Fredrickson *is an independent writer and editor focusing on technology, the environment, and history. She is a frequent contributor for continuing education courses and publications through Confluence Communications.* ***www.confluencec.com***

TAMLYN

TAMLYN is a family-owned company with more than 45 years in the building products industry. It continues to create new extruded aluminum trim components for the multifamily market across its XtremeTrim® and XtremeInterior™ lines. XtremeTrim is a line for various siding products from fiber cement to T&G cedar. XtremeInterior is a line of unique and contemporary details for drywall applications. For additional information, visit **www.tamlyn.com**.

SUBMIT YOUR PROJECTS!

2021 Record Interiors

We are looking for outstanding interiors projects—residential, commercial, and public—completed within the last year. These should address unique client needs with creative, sustainable solutions, resulting in spaces that are both beautiful and functional. Winning projects will be selected by an editorial jury and published in the October 2021 issue of *Architectural Record*.

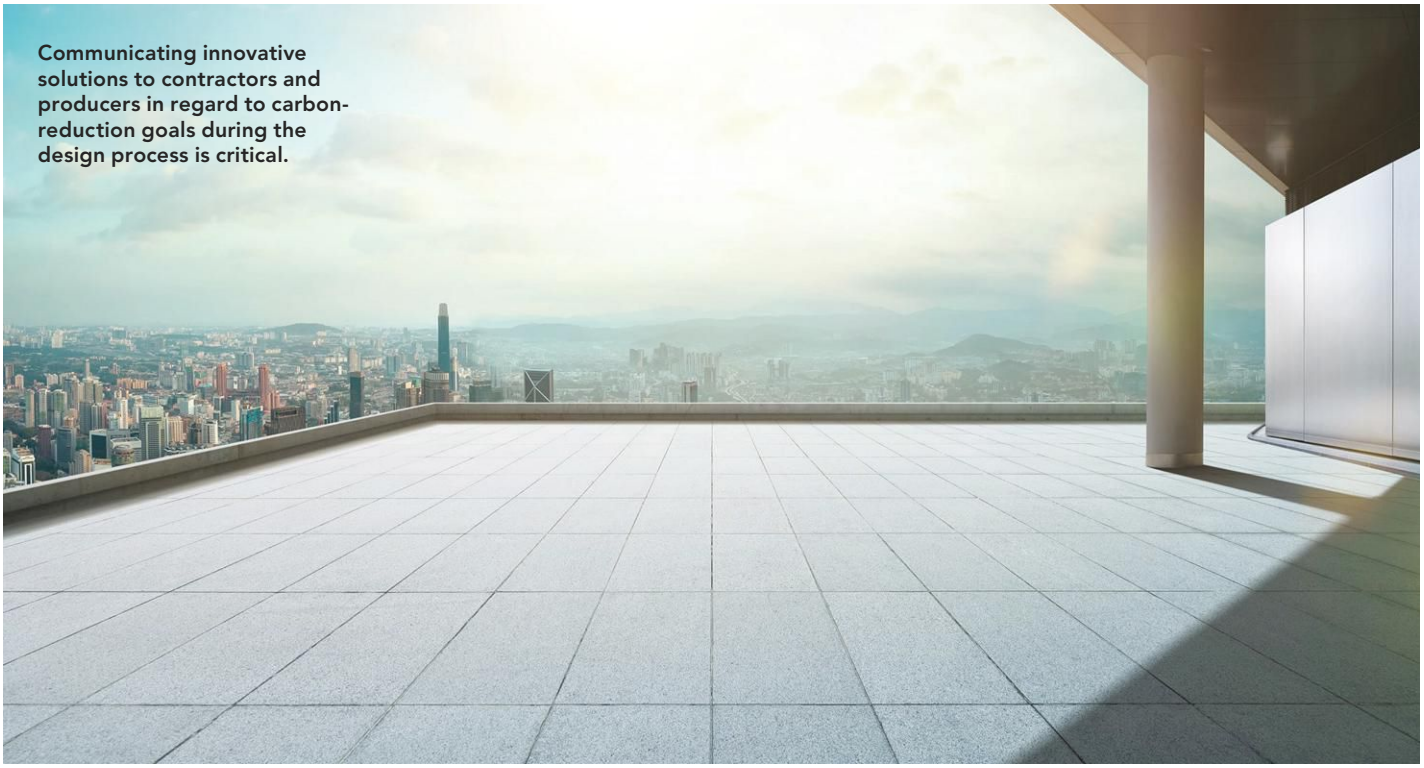
Enter online: architecturalrecord.com/call4entries

DEADLINE: JUNE 15, 2021



PHOTOGRAPHY: © JOE FLETCHER

RECORD INTERIOR 2020 WINNER: ONE EMBARCADERO CENTER LOBBY, SAN FRANCISCO BY GENSLER



Communicating innovative solutions to contractors and producers in regard to carbon-reduction goals during the design process is critical.

Photo: jamesteohart/Adobe Stock

The Top 10 Ways to Reduce Concrete's Carbon Footprint

Sponsored by Build with Strength, a coalition of the National Ready Mixed Concrete Association

Design and construction teams can implement 10 simple strategies in order to reduce concrete's carbon footprint. The strategies are meant to achieve a lower carbon footprint without impacting the other traditional performance criteria for concrete.

Concrete is unique among building materials. Its formulation is highly influenced by its application. Design professionals and contractors have a greater influence on concrete formulation than they do with other building products. Concrete can be made stronger, lighter, more flowable, stiffer, less permeable, and even weaker depending on the performance needs. All of these formulations can be made at the same factory within minutes of one another. No other building material is that versatile.

Concrete does not rot, rust, or burn. It can be exposed to the elements or for architectural reasons. Concrete is economical, available nearly everywhere, and made from the most abundant materials on the planet, usually from local sources. This course provides the top 10 ways to get all the benefits of concrete at a lower carbon footprint.

Continues at ce.architecturalrecord.com

CONTINUING EDUCATION

AIA Continuing Education Provider

1 AIA LU/HSW

Learning Objectives

After viewing this multimedia presentation, you should be able to:

1. Explain the basics of the embodied carbon of concrete.
2. Evaluate the immediate steps that can be taken to reduce the carbon footprint when specifying concrete.
3. Prioritize design strategies to get the greatest reductions in carbon footprint using current technologies and design tools.
4. Explore how innovative technologies will result in zero carbon concrete in the future.

To receive AIA credit, you are required to view the multimedia presentation and pass the quiz. Visit **ce.architecturalrecord.com** to take the quiz for free.

AIA COURSE #K2105Q

NRMCA | BUILD WITH STRENGTH

Build with Strength, a coalition of the National Ready Mixed Concrete Association, educates the building and design communities and policymakers on the benefits of ready-mixed concrete and encourages its use as the building material of choice. No other building material can replicate concrete's advantages in terms of strength, durability, safety, and ease of use. **www.buildwithstrength.com**

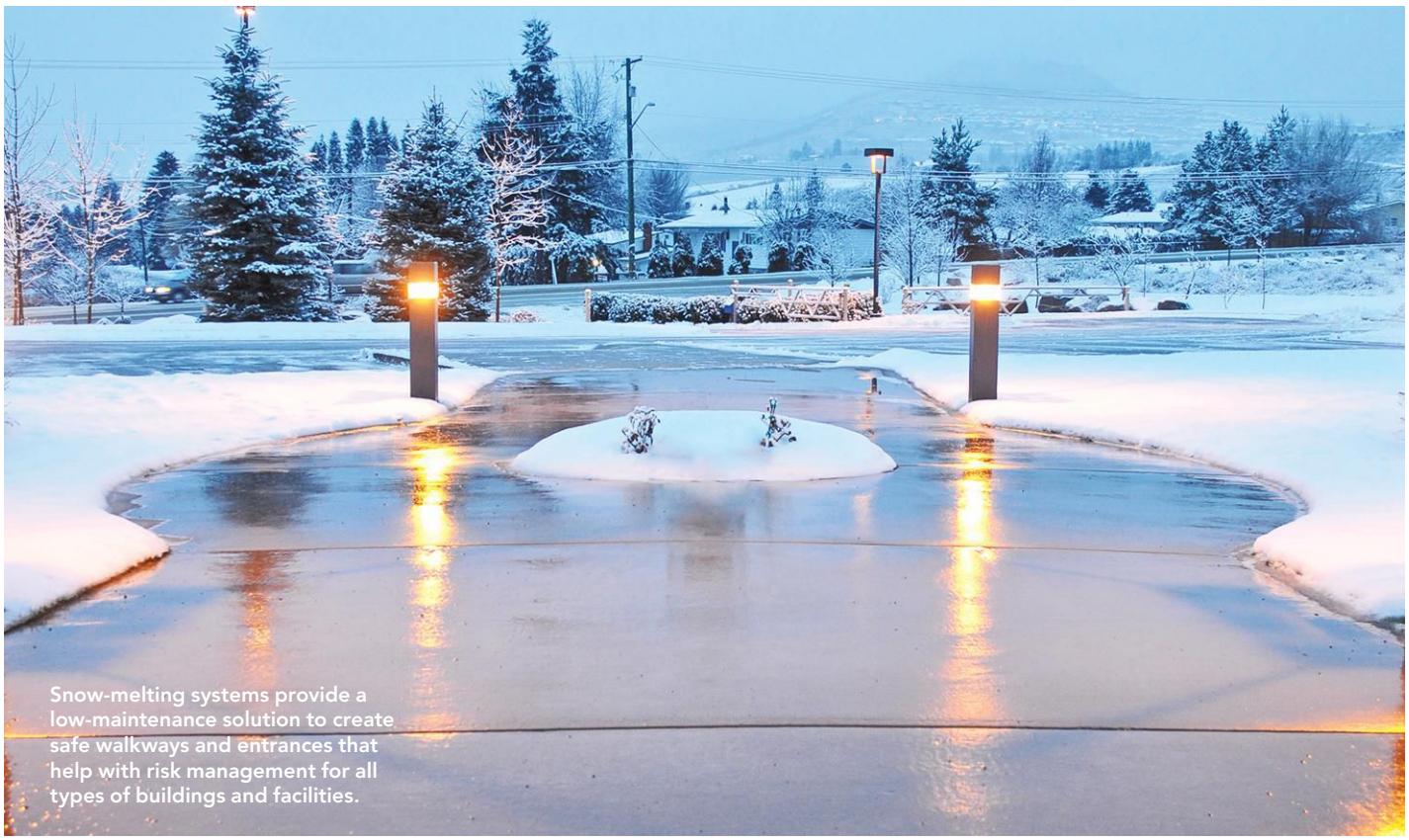


Photo courtesy of Watts

Snow-melting systems provide a low-maintenance solution to create safe walkways and entrances that help with risk management for all types of buildings and facilities.

Optimizing Snow-Melting Systems

Specifying system types, components, and controls to meet project-specific performance

Sponsored by Watts | *By Peter J. Arsenault, FAIA, NCARB, LEED AP*

Providing safe pedestrian or vehicular access in cold weather to a building entrance, walkway, or critical operation area means minimizing or eliminating the presence of snow and ice in those areas. In some facilities, this is done manually by maintenance staff who clear snow, spread ice-melt chemicals, and work to maintain clear and safe passage. The expense, impact of chemicals, and difficulty in creating a consistently safe condition pushes many building owners and operators to look for other solutions. As such, mechanical or electrical snow-melting systems are often designed and constructed to be placed below concrete, asphalt, or other paved areas to help ensure that pedestrians, and vehicles are protected from the hazards of snow and ice accumulation. This course looks at the ways that design professionals can investigate, design, and optimize a snow-melting system suited to the specific requirements of a particular project. This approach helps ensure control of the initial and ongoing costs as well the proper, long-term performance of these systems that create safe, clear passage in what could otherwise be a hazardous condition.

SNOW-MELTING SYSTEMS OVERVIEW

The basic function of a snow-melting system is to warm an outdoor surface to a temperature above freezing, allowing snow and ice

CONTINUING EDUCATION

AIA Continuing Education Provider **1 AIA LU/HSW**

Learning Objectives

After reading this article, you should be able to:

1. Identify the primary characteristics of snow-melting systems, including the ways that they help protect building users, owners, and the public.
2. Assess the design and performance considerations of both the buildings and their surroundings on successful snow-melting systems.
3. Recognize the primary parameters for the design of functional hydronic and electric snow-melting systems.
4. Investigate the range of options that are available for the control of snow-melting systems that help ensure the safety and well-being of people using the building or facility.

To receive AIA credit, you are required to read the entire article and pass the quiz. Visit **ce.architecturalrecord.com** for the complete text and to take the quiz for free.

AIA COURSE #K2105D

to melt and drain away safely. That surface might be a walkway into or out of a building that sees many people walking there daily, such as a retail, hospitality, health-care, educational, governmental, or other type of building. Keeping such walkways clear of snow and ice reduces the likelihood that someone walking there will slip, fall, and become injured. The surface might also serve vehicles, not just pedestrians. These vehicles could be large, such as cars, trucks, or buses, or small, such as forklifts, dollies, or robotic carts. They could also be specialty areas, such as a heliport on a building, an emergency room entrance, or a critical operations facility. Regardless of the type of traffic, the goal is usually the same: keep the area clear and safe for usage when snow and ice would be otherwise present.

System Need

Snow-melting systems are sometimes viewed as a luxury item or as an extravagance. This would only be true if safety is not a concern or if there is no cost to maintain and clear areas of snow and ice. The reality is that all buildings need to protect the safety and welfare of the people using them, and there is always a cost of labor and/or materials to keep a building safely maintained. The risks and costs are higher, of course, in geographic locations where snow is more common or frequent, or where the number of people or vehicles is high. Hence, snow-melting systems should be appropriately looked at and evaluated for each project as an option that meets the needs of building owners and regulatory agencies for safety and maintenance in climates that receive snow or ice storms.

Environmental Impacts

Many people are concerned about the environmental impacts associated with any building system. These concerns are fully justified, although snow-melting systems have been shown to be part of the solution, not part of the problem. The truth is that they are one of the eco-friendlier options available since they can reduce or eliminate use of salt or chemicals being introduced into the environment. Snow-melting chemicals are commonly used by maintenance staff, but they too melt and run into drains and sewers, where they can do damage to vegetation and aquatic life. Snow-melting chemicals are also well-known for the damage they can cause to concrete and other paved surfaces, causing shorter service lives and the need for replacement. This replacement then adds more environmental burden compared to a longer-lasting solution for concrete and other paved surfaces.

By using heat in selected locations in a snow-melting system, the need for chemicals is eliminated, thus eliminating their impact on the environment and the buildings. Also eliminated are the labor and time needed to spread these chemicals. The heat aspect of a snow-melting system is also very manageable based on proper efficiencies and controls, just like any other mechanical system. Designed, installed, and operated properly, snow-melting systems can be very energy efficient, so the energy use and cost impacts can be properly accounted for and controlled. If the energy comes from a renewable, non-polluting source (i.e., solar electric, hydroelectric, wind, etc.), the environmental impact of the energy used is drastically diminished.

REASONS TO INCORPORATE A SNOW-MELTING SYSTEM

While different buildings and owners may have different motivations, there are a number of common reasons that the decision is wisely made to include a snow-melting system in a project including:

- Reduction in salt or chemical use, thus reducing damage to the environment, including aquatic life.
- Reduction in accidents due to personal injury from slips, falls, and manual snow shoveling.
- Reduction in liability and insurance claims from accidents and injuries to building occupants, users, and staff.
- Reduction in damage to architectural concrete and paving surfaces, such as paving bricks or stones, curbs, etc., thus improving longevity of those surfaces.
- Improved safety on critical areas, such as inclined parking ramps, loading docks, outdoor stairs, rotating equipment (gondolas), emergency care areas, and helipads.

System Costs

The discussion of any building system cost should always include a review of not only first costs but also ongoing operating costs and the residual costs of an alternative. Often, building owners, especially residential ones, only take into consideration the initial cost of the system. In doing so, they fail to see the intrinsic benefits of a system that can prove to be much less costly over the life of the building. The cost of installation can be allowed for in the project budget and may in fact be a very small percentage of the total project cost. Similarly, the operating cost of a snow-melting system can be managed and accounted for so that it becomes an anticipated and controlled expense. All of these costs, although they may seem expensive at first blush, can be significantly outweighed by the benefits of less labor, less maintenance, less chemicals, less risk of liability, and less potential damage to building surfaces. By doing this type of review, some building owners ultimately conclude that they cannot afford the alternatives after all—it makes better economic sense to include a snow-melting system.

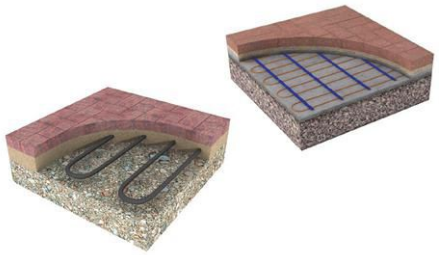
System Types

There are two basic types of snow-melting systems available: electrical systems and hydronic systems. Electrical systems use electric current run through specially designed heat-generating resistance wires to create the needed heat for the snow-melting function. Hydronic systems use a water-glycol fluid circulated through tubing (piping) and boilers to generate heat. Many aspects of these two systems are similar in terms of the principles behind their design, installation, and operation—it is just some of the components and system parts that are different.

The type of system selected for a particular project will often be predicated on the size of the area to be heated. An installation less than 1,500 square feet usually means that electrical is more economical since a boiler is not required. For example, most residential systems are smaller and tend to use an electric rather than hydronic system. Nonetheless, any size system where a boiler or hydronic system is not desired or practical will tend to be electric.

Larger installations often benefit from hydronic systems. This is particularly true if they can be linked to an existing boiler and can gain some overall boiler efficiencies. However, there are many cases where it makes more sense to use an appropriately

Images courtesy of Watts



Hydronic snow-melting systems (left) and electrical systems (right) work on the same principles, just with different components and design implications.

sized dedicated boiler. Since each building is unique, a review of the applicability of both system types (hydronic versus electric) may be warranted to discern which is the best choice for a particular project. This review should include the practical aspects of installation, costs, benefits, and differences between the two systems.

Regardless of the type selected, all snow-melting systems operate using automatic and manual controls. These controls are essentially the same from the standpoint of the user whether electric or hydronic systems are used. There will be some difference in what is being controlled of course (electric current or hydronic fluids), but the overall concepts and principles are straightforward and well known.

BASIC CONSIDERATIONS FOR DESIGN AND PERFORMANCE

Before designing a snow-melting system, there are several site- and building-specific conditions that need to be addressed. There is also the need to establish proper expectations and quality assurance standards for a system ahead of time. These considerations are reviewed further in the following paragraphs.

Site Conditions

The building site and the specific outdoor areas targeted for a snow-melting system need to be fully assessed to design and install an effective solution. Such an assessment should consider the following:

- **Surfaces to be treated:** The use of the surface(s) intended for snow-melting should be understood first. Is it a critical use area in constant use or an occasional use area only at certain times of day or the week? Similarly, is there anything about the material used or the surface treatment that needs to be taken into account? For example, is the surface going to be smooth concrete, brick pavers, asphalt, or some other material? A basic understanding of the design intent and material of the surfaces will help inform the different aspects of a site assessment.
- **Surrounding area:** The surfaces do not exist independently from their surroundings. Rather, buildings and other features around the snow-melting area can have impacts on the snow-melting surface in different ways. Direct solar visibility onto the snow-melting surface could cause melting independently from the system during daylight hours. Conversely, a shaded area may never receive any solar benefit and need to rely entirely on the snow-melting system. By the same token, areas that are prone to wind are different from areas that are protected. Wind can cause drifting and accumulation of snow onto a surface, requiring more attention than those that are protected.

  It is important to recognize that a single building can have several different conditions in different specific areas. One walkway may be shielded by adjacent buildings and another may be exposed, for example. A driveway may get 24-hour use but a walkway may not. In cases like these, different conditions need to be accounted for—one snow-melting system approach will not likely be appropriate for all of them. The usual implication is to anticipate the need for different operations and create different snow-melting zones. This way, each different area can be controlled separately to respond to the different conditions and snow-melting needs.
- **Drainage:** When a snow-melting system is working properly, it will turn snow or ice into water, which then needs to drain harmlessly away. Where that water drains to needs to be designed into the project and will be different for each one. In some cases, this drainage could be along the sides of the snow-melting area in troughs, swales, or gutters. In others, it could be picked up by trench drains and channeled into an underground drainage system. Other drainage options are also certainly possible.

  It is important to keep in mind that areas along the side of melted areas are usually covered by snow and ice, which may interfere with drainage there, causing all the melted water to move in one direction along the pitch of the melt area.

Photos courtesy of Watts







Every project must be assessed to determine the owner's needs, particular site conditions, and performance expectations of a system.

Note that draining melt water commonly moves faster than a typical rainfall. This means drainage rate and flow needs to be addressed so that one safety concern (snow and ice) is not replaced with another one (excessive drain water). It is also important to recognize the need for water to drain away after the system is turned off so ice does not form from the meltwater. This may imply a zone that keeps the drainage area warmed during and after the operation of the snow-melting system. Finally, never drain a system to a street or public thoroughfare since it will then freeze and build up there, causing other problems. All these drainage conditions need to be assessed and accounted for to create a successful snow-melting condition.

Photo courtesy of Watts



The edges of a snow-melting system need to be taken into account, particularly in terms of how the melt water will drain safely away from a treated area.

Available Heat Sources

Different buildings and sites may have different options in terms of the heat source for a system. In some cases, electric may be the only practical option if natural gas, propane, or other fuels are not available. In these cases, the system will likely connect to the building's electrical system. The source of electricity could be the local electrical utility, a local renewable energy system, or a cogeneration system if that is used. The available source should be considered for capacity and economy.

Hydronic heat sources can similarly vary based on the building conditions. An existing water or steam-based boiler may have the capacity to handle the snow-melting needs. If not, one or more stand-alone boilers may be appropriate. It will be important to know the type of fuel that is available to power these boilers either way and plan accordingly. Alternatively, energy-recovery or energy-capture systems can be used as a heat source. This is common in locations where there is a large refrigeration load (e.g., supermarkets, food storage, etc.). In these cases, the extracted heat is captured and channeled into useful energy for the building systems.

Regardless of the heat source, in all cases, the critical factors for the success of a snow-melting system are the British thermal units (BTUs) of heat provided, the temperature of the snow-melting surface and the system, and the flow of heated fluids (GPM). Therefore, identifying the available options to assure these factors are achieved is clearly important.

Performance Expectations

When planning a snow-melting system, it is always helpful to have everyone on the same page in terms of expectations about how the system will perform. Ideally, this means a conversation with not only the building owner but also the facilities manager or maintenance staff who will be using that system is warranted. The objective is to overcome some misperceptions about how a system works and dispel any notion that it is an "instant" solution. Some of the key performance expectations that need to be understood include the following:

- **Response time:** Most systems need between 30 minutes and 1 hour before results are visible on the surface. Immediate melting should not be expected.
- **Slab and paving warming:** The time required before melting occurs depends on the outdoor air temperature and the corresponding temperature of the slab or pavement. Before the snow can melt, the system needs to overcome the slab temperature first. As would be expected, the colder the slab is, the longer it will take to get it up above freezing temperatures.
- **Full melting:** It will likely take 4–6 hours to melt snow completely in most situations. This will vary, of course, based on the amount of snow present, the temperature, and the weather conditions. Most controllers are set to run for 4 hours and can be adjusted as needed.
- **Troubleshooting:** It is very rare that a system does not work at all. It is more common that design assumptions vary from reality. The system could be designed for a different amount of snowfall than occurs, the density of the snow can vary, etc. There may also be unintended variances between design and installation, such as tubing depth variations or material thickness changes, which result in different supply temperatures being delivered than planned. These variances can be avoided through careful adherence to the design and specifications of a system and implementation of quality-control measures during installation.

Quality-Control Standards

There are a number of industry standards that apply to snow-melting systems that address both quality control and regulatory compliance. Some of these include:

- **FCC:** Federal Communications Commission for control systems that use wireless message delivery.

Continues at ce.architecturalrecord.com

Peter J. Arsenault, FAIA, NCARB, LEED AP, *is a nationally known architect, continuing education presenter, and prolific author advancing high-performance buildings through better design.* ***www.pjaarch.com, www.linkedin.com/in/pjaarch***

WATTS

Watts is a global leader in the design and manufacture of innovative water solutions for residential, commercial, and institutional environments. Products include an extensive line of flow-control, filtration, and treatment products for water quality and residential plumbing and heating. Founded in 1874, Watts is headquartered in North Andover, Massachusetts. **www.watts.com**



Automatic smoke vents were installed on the roof of the Cincinnati Music Hall when the 140-year-old facility underwent a major renovation.

Photo courtesy of Imbus Roofing

Fighting Fires and Saving Lives in Large, Single-Story, Undivided Buildings

A closer look at the need to incorporate automatic smoke vents into these designs

Sponsored by The BILCO Company | *By Jeanette Fitzgerald Pitts*

A tragic truth about building codes is that they are often based on the tough lessons learned from disasters that could have been avoided. Fire safety is a perfect example of this phenomenon. Consider the Great Chicago Fire of 1871, which was supposedly started by Mrs. O'Leary's cow knocking a lantern into hay, fueled by the massive number of constructions of wood and other combustible materials hastily erected to serve Chicago's rapidly growing population, and finally stopped when it ran out of fuel.

The fire destroyed one-third of Chicago's buildings and killed 250 people. As a result, fire and building codes changed the spacing and material requirements that were used for reconstruction.

Continues at ce.architecturalrecord.com

Jeanette Fitzgerald Pitts *has written nearly 100 continuing education courses exploring the benefits of incorporating new building products, systems, and processes into project design and development.*

CONTINUING EDUCATION

AIA Continuing Education Provider

1 AIA LU/HSW

Learning Objectives

After viewing this multimedia presentation, you should be able to:

1. Explain why using automatic smoke vents in large, single-story, undivided buildings became common after the 1953 General Motors fire and the standard that was developed to guide the design of these life-safety systems.
2. Understand how automatic smoke ventilation changes the development of a fire in large, single-story, undivided buildings, and the benefits that this fire- and life-safety product provides.
3. Identify the applicable fire- and life-safety codes that dictate the use of automatic smoke ventilation.
4. Specify the automatic smoke vent that is best suited for the unique needs of a project.

To receive AIA credit, you are required to read the entire article and pass the quiz. Visit **ce.architecturalrecord.com** for the complete text and to take the quiz for free.

AIA COURSE #K1905K

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For more than 90 years, The BILCO Company has been a building industry pioneer in the design and development of specialty access products for both commercial and residential projects. The ISO 9001-certified company is a wholly owned subsidiary of AmesburyTruth, a division of Tyman PLC. **www.bilco.com**

Upcoming Exhibitions

Housing for a Changing Nation
Chicago
Starting May 2021
Sponsored by AARP Illinois and AARP Foundation, Chicago Architecture Center exhibition will explore how local architects are replacing 19th and 20th century housing with homes designed for quickly changing, diverse,and multi-generational households and communities that require accessible and affordable housing. Highlights include a multi-generational home in the Pilsen neighborhood, vacant storefronts transformed into flexible live and workspaces for small business owners, and a micro-housing complex in South Chicago with a community kitchen, retail marketplace, a scaled workspace. More at: www.architecture.org.

Time Space Existence
Venice
May 22–November 21, 2021
The European Culture Centre presents the biennial architecture exhibition in its fifth iteration. The exhibition features both completed and ongoing projects, in addition to innovative proposals and research, with over 200 interdisciplinary invited participants investigating the fundamental themes of time, space, and existence and how they relate to design of the built environment. With the goal of creating an exchange among architects, developers, photographers, artists, engineers, universities, emerging studios, and established global presences, the center aims to bring together those who help shape the future. Learn more at ecc-italy.eu.

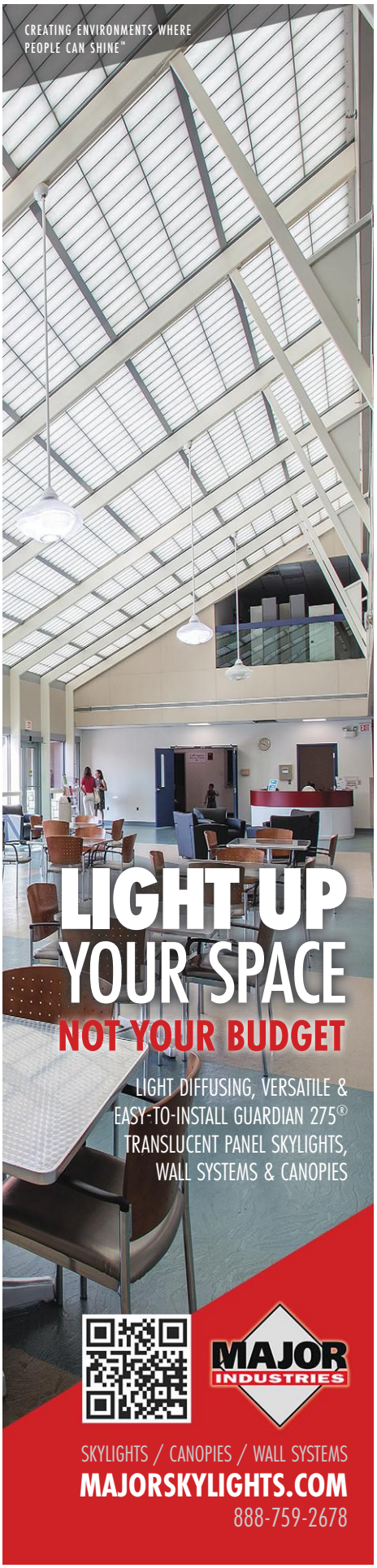
Mark Bradford
Menorca, Spain
July 17–October 30, 2021
Hauser & Wirth Menorca, the new gallery on Isla del Rey in the port of Mahon in Menorca, will be inaugurated by an exhibition featuring an array of new paintings and sculptures by Mark Bradford. Through a conservation project over a two-year period, Hauser & Wirth has repurposed a slew of historic buildings on the island to create the art center that includes a sculpture trail with works by Louise Bourgeois, Franz West, and Eduardo Chillida, among others. The center has also created an education program to engage both visitors and members of the local community in contemporary-art workshops, screenings, and talks. See more at hauserwirth.com.

Ongoing Exhibitions

Reconstructions: Architecture and Blackness In America
New York
Through May 31, 2021
MoMA's exhibition explores how race structures American cities through the relationship between architecture and African-American and African-diaspora communities. Each of the 10 newly commissioned works, by artists, architects, and designers, proposes interventions in urban spaces that examine the intersections of racism and Blackness as sites of resistance. The exhibition spotlights the ways that centuries of disenfranchisement and race-based violence have been embedded in nearly every aspect of American design, while imagining ways for equity to be built. *Reconstructions* features works by Emanuel Admassu, Germane Barnes, Sekou Cooke, J. Yolande Daniels, Felecia Davis, Mario Gooden, Walter Hood, Olalekan Jeyifous, V. Mitch McEwen, and Amanda Williams. More at moma.org.

When Practice Becomes Form: Carpentry Tools from Japan
New York
Through June 13, 2021
The exhibition at the Japan Society celebrates architecture and craftsmanship through Japanese woodworking tools, as well as architectural patterns and models. It features a site-specific installation, conceived by architect Sou Fujimoto in collaboration with Brooklyn-based Popular Architecture, that interprets themes of the exhibition, highlighting the connection between traditional Japanese wood construction and modern architecture. More at japansociety.org.

Niki De Saint Phalle: Structures for Life
New York
Through September 6, 2021
The exhibition at MoMA PS1 presents over 200 works of feminist American and French artist Niki de Saint Phalle (1930–2002), including sculpture, prints, drawings, jewelry, films, and archival materials, created from the mid-1960s until her death. The selected pieces will showcase the artist's interdisciplinary approach, which engaged with both social and political issues to transform individuals, the environment, and society as a whole. More at moma.org/ps1.



Iittala-Kaleidoscope
From Nature to Culture
Helsinki
Through September 19, 2021
Helsinki's Design Museum invited architect Florencia Colombia and industrial designer Ville Kokkonen to research and create the exhibition on Finnish brand Iittala's 140-year history, prominently featuring glass and other design classics. For more information, go to designmuseum.fi/en.

Competitions

Healthier Design Innovation Contest: Role Models
Deadline: May 17, 2021
Parson's Healthy Materials Lab's 6th annual Role Models contest is open for submissions. Parsons hopes to award a design activist promoting equity and addressing climate change for presenting an innovative scheme that utilizes materials that won't harm the planet. The competition will be judged on entries' clarity of argument for positive human health impact, environmental benefit, demonstration of carbon impact and of future-oriented thinking. For more, go to healthymaterialslab.org.

The Architecture MasterPrize
Deadline: June 30, 2021
For 2021, its 6th edition, Architecture MasterPrize (AMP) invites architects, designers, and design students from around the world to submit innovative projects dedicated to the art and science of architecture. Awards will span landscape architecture, interior design, architecture-product design, architectural design, and firm of the year. For the first time, it will also include an Architecture Photography MasterPrize, honoring images of the built environment. Find more information at architectureprize.com.

Fentress Global Challenge 2021
Airport of the Future
Deadline: October 1, 2021
Fentress Architects has announced that the 2021 challenge is open for entries. The eighth year of the annual international competition will aim to challenge students from around the world to envision innovative terminal designs for future airports. Shortlist announcement: November 1, 2021. Winner announcement: December 1, 2021. See fentressarchitects.com.

Events

Venice Architecture Biennale 2021
May 22–November 21, 2021
The 17th International Architecture Exhibition, curated by architect Hashim Sarkis and organized by La Biennale di Venezia, will include 112 participants from 46 countries. Weekends on Architecture, composed of a series of lectures and programs with architects and scholars from around the globe, address the title question, "How Will We Live Together?" Topics include the challenges of climate crisis, the role of urban space in public uprisings, changing forms of collective housing, the architecture of education, and the relationship between curation and architecture. See labiennale.org/en.





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DATES & Events

Magic Lies Outside
Grand-Métis, Quebec
June 26–October 3, 2021
The International Garden Festival's 22nd edition unveils selected contemporary installations at Les Jardins de Métis/Redford Gardens from landscape architects and designers. Of 160 projects, five have been selected, from four countries—Canada, the United States, France, and Sweden—that offer a mix of curated environments, natural experiences, horticulture staging, and human creativity. For more information, see internationalgardenfestival.com.

Built Environment Summit
London & online
October 27–29, 2021
Together with Architecture 2030 and Architects Declare, the Royal Institute of British Architects will host a three-day summit from London via live webcast, ahead of the United Nations' 2021 Climate Change Conference in Glasgow. Supported by the Global Alliance for Buildings and Construction, the American Institute of Architects, and ALA Assoarchitetti, the participants will analyze the built environment's relation to the UN's zero carbon goals, calling on governments around the world to provide support. Speakers will be announced by the end of June. See builtenvironmentsummit.org.

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Ⓡ Regional AD

SNAPSHOT



WITHIN the library of Japan's Kadokawa Culture Museum, designed by Kengo Kuma & Associates (KKAA), staggered planks of cedar plywood form bookshelves that rise to a towering 26 feet. The museum is part of Tokorozawa Sakura Town, a pop-cultural complex northwest of Tokyo that includes a book-manufacturing facility, event halls, retail, and an anime-themed hotel. The museum, described by Kuma's team as a "futuristic labyrinth of modern society," aims to prompt the pursuit of knowledge while breaking barriers to access often associated with museums and libraries (even if many of the books are literally out of reach). The shelves' complexity is meant to reflect "the agitation of culture," according to KKAA partner Suguru Watanabe, and to refer to the *chigai-dana* (staggered shelves) and *kasumi-dana* (shelving arranged to represent mist or clouds) found in the Japanese *Shoin-zukuri* style, which forms the basis of traditional residential architecture. "We aimed to create shelving that looks like a brain structure that connects forever," Watanabe says. Twenty-five units, supported by steel-and-wood brackets and interspersed with 24 video monitors, comprise the soaring walls of the 900-square-foot, double-height library. The gargantuan bookshelves display some 30,000 volumes, which—upon request—the staff pluck at night, using an aerial work platform, to have ready for readers the next day. *Ilana Herzig*

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