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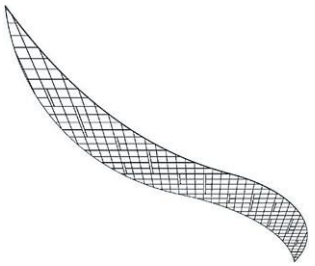

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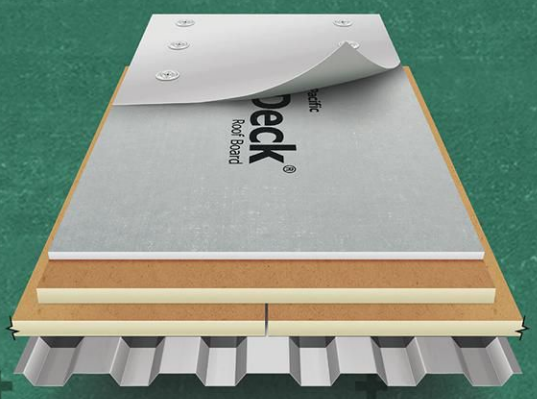

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All you need is to glance at the comparison chart to see how DensDeck® Roof Boards outperform riskier options like HD ISO. HD ISO has it's place—it's made from high-density foam insulation, so it's lightweight, easy to handle, and has a good R-value. But if a resilient rooftop that's meant to last is part of your design intent, HD ISO can't provide the rigid cover board protection you need.

MORE SUPPORT FOR HEAVY EQUIPMENT INSTALLATIONS

Today, nearly all commercial rooftops have some sort of equipment installed, from HVAC units to solar equipment. Looking forward, the U.S. solar industry is expected to triple in size by 2028.[1] The weight of these installations, plus the threat of dropped tools and heavy foot traffic during maintenance, can damage a roof without adequate support. And, if the roof and the solar panels have a similar lifespan, you'll help building owners avoid the cost of panel removal and reinstallation during re-roof jobs.

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Fire is always a risk to commercial low-slope rooftops. It can spread quickly from nearby buildings or vegetation—it just takes one burning ember and the right conditions. If your rooftop could have solar panels installed, there also is an increased fire risk from the electricity they produce. That's why it's smart to choose fire-resistant materials. DensDeck Roof Boards are noncombustible per ASTM E136. Their gypsum core and fiberglass mat facers help to mitigate the risk of rooftop fire damage from every direction. HD ISO is combustible—it's made of foam insulation that will smolder and burn under certain conditions. Make sure you're specifying the right materials for your design intent. See how the two cover boards compare in fire tests at DensDeck.com/Risky.

[1] https://www.seia.org/research-resources/solar-market-insight-report-q2-2023#:~:text=Over%20the%20course%20of%20ourof%20year%2Dend%202022
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More than a trend, the benefits of biophilic design remain much sought after in the world of architecture. While up to this point much of the biophilic design elements have focused on options like improved daylighting or exposed wood and natural stone, biophilia also includes the human element, specifically art.

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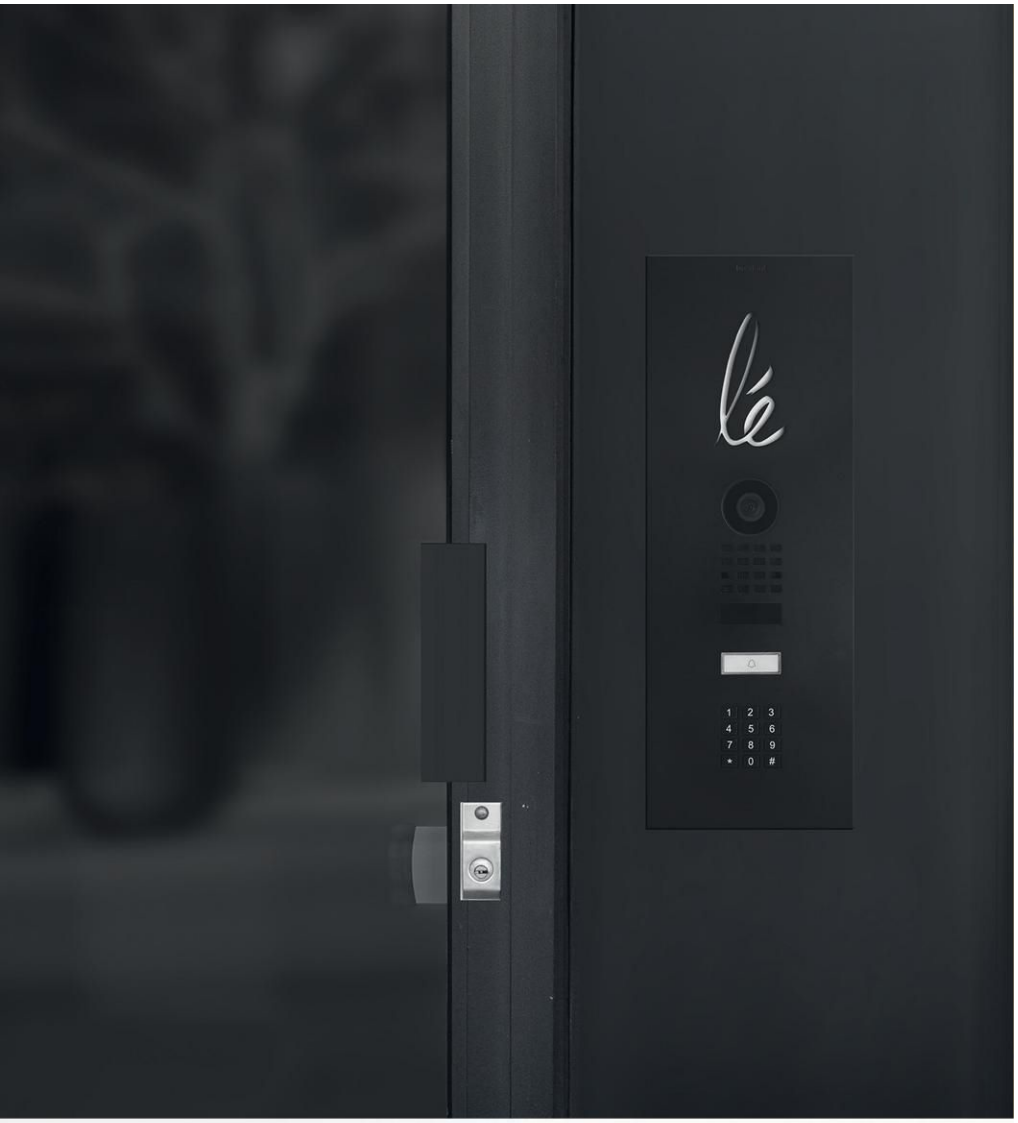

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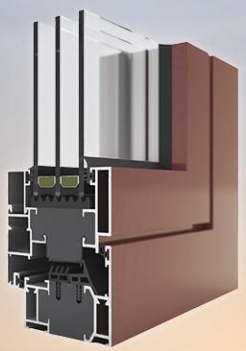

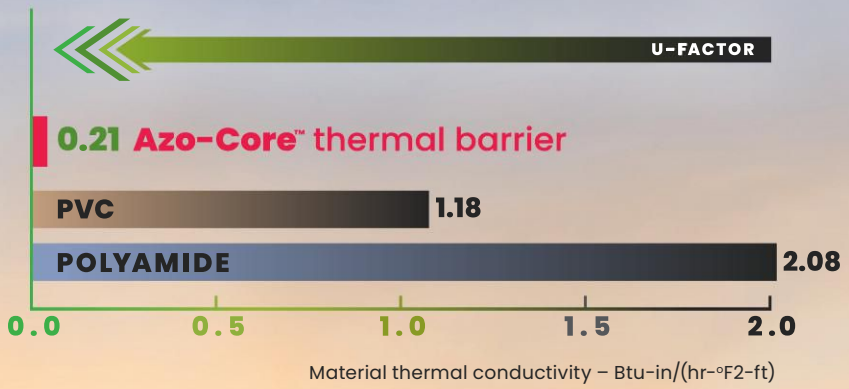

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IN FEBRUARY, a major corruption scandal rocked the New York City Housing Authority (NYCHA), leading to the arrests of 70 then-current and former NYCHA workers and contractors. It was the largest single-day bribery takedown in Justice Department history.

Despite the vast scope of the charges—NYCHA employees demanded and received cash in exchange for NYCHA "no-bid" contracts that were, in turn, often grossly overpaid—it hardly came as a surprise to New Yorkers, who would regularly see images on local television of rat-infested NYCHA apartments that time and again went without heat in winter. The enormity of the operation was matched only by the absurdity of the goings-on at the largest public housing authority in North America. A recent review of NYCHA invoices revealed—in what was probably one of the more outrageous instances—that the agency paid a "no-bid" vendor over $708 to change a light bulb.

While most people may have become numb to these pay-to-play problems at government bureaus, it's the by-the-book costs that offend me. This issue of RECORD, focusing on multifamily buildings, features examples of workforce, supportive, and transitional housing—all presumably "affordable." But affordable is an elastic term, and, while it may, in a sense, be "affordable" for residents to occupy these dwelling units, they certainly aren't cheap to build—they can cost up to 25 percent more than comparable market-rate housing. The San Mateo County Navigation Center (page 96), interim housing for the formerly homeless, stands out as a less expensive model. It was constructed using a prefabricated modular system that, at $237,500 a door, cost less than half the amount conventional construction does: similar units for these types of housing—typically simple, rectangular spaces ranging between 250 and 400 square feet—can cost upward of $500,000. Could you imagine paying half a million dollars to build a box that accommodates little more than a bed, a bathroom, and a kitchenette? Why do government agencies and nonprofits pay that much?

"The list of regulatory and other issues that drive up the cost of affordable housing is endless," says architect Larry Scarpa, cofounder of the Affordable Housing Design Leadership Institute. "It's normal for many of our projects to have up to 12 funding sources, each with their own separate and unique requirements, such as size of rooms, length of countertops, amount of storage, or clearance around beds. And one of the most costly considerations, the 'elephant in the room,' is the Americans with Disabilities Act—100 percent of affordable housing must be either adaptable or accessible, when only a small percentage of the population is recognized as having disabilities under definitions that align with the ADA."

Whether a result of corruption, red tape, or something else, somewhere along the line, things went very wrong. A panel discussion last month, cosponsored by Open House New York and The Architectural League of New York, centered around the book *Housing the Nation: Social Equity, Architecture, and the Future of Affordable Housing* (excerpted in the February issue of RECORD), explored the evolution of this dire situation. NYCHA, for instance, started out as an "exemplar of good, solid, affordable housing for working people," said David Burney, its chief architect from 1990 to 2004, at the event. Skid Row Housing Trust, another institution that had long stood as a celebrated model for providing shelter to formerly homeless people, imploded last year. It happened, in part, as *The Los Angeles Times* reported, because of the challenging financing model for the housing stock it set out to save, mainly single-room-occupancy buildings.

While it's easy to point out the problems, it's seemingly impossible—especially as architects—to fix them. But architects should remember that providing decent housing for the people has long been a central project of the profession. Good design that makes affordable housing attractive to its constituency and communities can provide the impetus to overcome the egregious economic and political barriers to its development.

Josephine Minutillo, Editor in Chief

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HOUSE of the Month

SAMEEP PADORA + ASSOCIATES PLANS AN URBAN ENCLAVE AROUND A COMMUNAL SPINE IN GOA, INDIA. **BY LEOPOLDO VILLARDI**

PHOTOGRAPHY: © STUDIO SURYAN / DANG

THE INDIAN STATE of Goa has built a reputation around its white-sand beaches and the promise of laid-back living. Owing to its colonial history as a trading post for faraway Portugal, it's quite different from most of the rest of the country too. In place of polychromatic temples, pristine white churches and lavish villas abound. Tourists flock here, as do native Indians, in search of *susegad*—an unbothered and carefree frame of mind.

In recent years, an influx of visitors and new residents has spurred a demand for housing. "The idyllic setting is especially appealing to those trying to get away from city life," says architect Sameep Padora, founder of Mumbai-based studio sP+a and, since 2023, dean of the faculty of architecture at CEPT University in Ahmedabad. "But the typical situation in Goa is a single-family house on an individual plot—it's almost suburban," he

SECTION

1 BALCÃO
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6 STUDY
7 BEDROOM
8 OPEN-AIR COURT

Terra-cotta roofs terminate at a *balcão*, a shaded entry porch (above). High-ceilinged interiors open directly to the outdoors or balconies (opposite, both).

adds. In the coastal village of Anjuna, situated near the mouth of the Chapora River, Padora and his team have devised a denser, more neighborly enclave comprising a collection of individual dwellings, for a design-minded developer. "She is trained as an architect," Padora says of his client, "and, along with her sister and business partner, is really interested in creating places with a sense of community."

Striking the right balance between privacy and sociality meant imbuing the project, Kasu Zama, with a certain urbanism—achieved by packing 14 residences (each ranging from 2,000 to 2,700 square feet), along with a handful of outbuildings, onto a minuscule 1.2-acre site. But what distinguishes the housing development from others in the area is the architects' considered approach to planning.

Straddling a meandering pathway paved with setts, the residences jog in and out to reveal basalt-faced alley walls with punchy white window surrounds, or lush poufs of fragrant jasmine and heliconia. This central spine, forming a shared social space, urges slowness as residents wander down the curving road on their return home. A uniform architectural expression may persist, but the enclave's organization resembles something of an intimate, tight-knit village that has grown with time—despite being built in a period of four years, and in stark contrast to orthogonally planned compounds nearby.

Adding to the complexity, two different

A small court slices through each of the residences, bringing light deep inside (left).

residential models populate the community: a shorter, two-story A-frame type, and a taller, three-story type planned on split levels. With steep roofs dressed in terra-cotta, each features a *balcão*, a shaded entry porch with seating used to socialize with neighbors—a lingering Lusophone influence embedded in the architectural vernacular. "It's a threshold that sits outside the house, but also within it, inviting interaction between residents," Padora says, adding that all the living and dining spaces have been intentionally designed to flow from the street. The split-level abodes also feature quaint three-sided courts, which bring light deep inside and create upper-story outdoor balconies.

At the edges of the enclave, the topography slopes downward. With India's monsoon season in mind, the architects graded the site to redirect the flow of water, when necessary, to back gardens and pools rather than the communal street. A low perimeter wall of coursed laterite—an iron-rich stone that pairs well with the terra-cotta—ensures some privacy but is more of a boundary-defining feature than an imposing barrier.

Despite catering to a higher-income clientele, Kasu Zama resonates with the same uplifting community-oriented values that permeate much of Padora's work, from shelters for the homeless to spaces of worship, without ceding an interest in form-making. And now, partnering with the same client, his office will soon break ground on even denser housing for Goa's middle class. ■

Credits

ARCHITECT: sP+a — Sameep Padora, Aparna Dhareshwar, Vami Koticha, Sakshi Ghulati, Anisha Malhotra

ARCHITECT OF RECORD: Paresh Gaitonde

ENGINEERS: Meptek Consultants (m/e/p); R & J Structural Consultants (structural)

CONSULTANTS: Studio Taan (interiors); The Concise Desines (landscape)

GENERAL CONTRACTOR: Abraham & Thomas Engineers

CLIENT: Kasu Developers

SIZE: 34,400 square feet

COST: withheld

COMPLETION DATE: April 2022

Sources

ROOFING: ASIC Roofing Solutions

WINDOWS: Ornate Windows

HARDWARE: Häfele

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Albert Frey's Aluminaire House Lands in Palm Springs

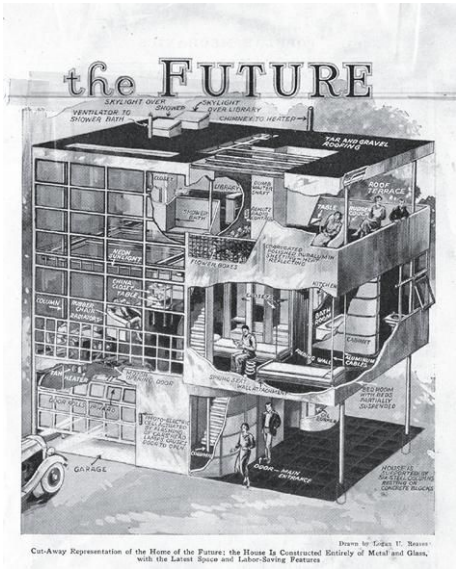
BY RUSSELL FORTMEYER

IF THE REPUTATION of Palm Springs as a bastion of Modern architecture can be blamed on anyone, it must be Albert Frey. That much is clear from a comprehensive exhibition—tagged with the subtitle *Inventive Modernist* and curated by designer Brad Dunning—of Frey's oeuvre now at the Palm Springs Art Museum's architecture and design gallery through June 3. To accompany the show, on March 23, the museum unveiled the permanent installation of Frey's Aluminaire House (1930–31) in a desert garden plot south of its main building.

The story of how a house designed for the 1931 Architecture and Allied Arts Exposition in New York made its way from Manhattan to Long Island to Palm Springs is almost as interesting as Frey's somewhat Forrest Gump–style journey through Modern architecture from Europe to California. For anyone unfamiliar with the Swiss-born Frey, who died in 1998, the exhibition places him at the table with Le Corbusier in 1928, executing design details for sliding glass doors and a bathroom lounge for the Villa Savoye—arguably one of the ultimate Modernist houses. With the cachet of working for Corb, Frey moved to New York in 1930 and joined the office of A. Lawrence Kocher, an architect who also happened to be the managing editor of RECORD. It was under Kocher that Frey designed the Aluminaire.

After relocating to Palm Springs in 1934 to oversee construction of a project for Kocher, Frey managed to be lured back to New York in 1938 to contribute to the design of the Museum of Modern Art with Philip Goodwin and Edward Durell Stone. The oculi along MoMA's roof terrace, which Frey designed, are the progenitors of Frey's later experiments with circles in his own architecture back in Palm Springs, such as the entrance to the City Hall (1957) or the whimsical porthole windows on the North Shore Yacht Club (1958), restored and accessible south of the city along the Salton Sea.

The Aluminaire House (above) was hailed as the house of the future by *Popular Mechanics*, which illustrated it with a cutaway section (below).



Cut-Away Representation of the Home of the Future; the House Is Constructed Entirely of Metal and Glass, with the Latest Space and Labor-Saving Features

The Aluminaire House was among the few American projects included in the 1932 *Modern Architecture: International Exhibition*, curated by Henry-Russell Hitchcock and Philip Johnson at MoMA. (The only other American house included in the book from the exhibition was Richard Neutra's Lovell House from 1929, now only two hours west of the Aluminaire in Los Angeles.) The exhibition neatly lays out Frey's luminous history, punctuated with the publicity he generated over the years as Palm Springs' most noteworthy early Modernist.

Frey relied on Kocher and his editorial influence to realize the Aluminaire—for example, the Aluminum Company of America (ALCOA) donated materials to build the house for the one-week-long exposition in 1931. Such design-industry partnerships informed many demonstration projects in the 20th century—one being the all-plastic Monsanto House of the Future, installed at Disneyland in 1957—but Frey had a long love affair with aluminum. Frey's first Palm Springs house for himself, which he began in 1940 and where he started using corrugated aluminum siding, was featured in a 1956 publication, "Aluminum in Modern Architecture," part of a series of case studies and design guidelines produced by the Reynolds Metals Company to promote aluminum use in buildings. He's arguably the godfather of aluminum in architecture.

After the 1931 exposition, the Aluminaire House was purchased by architect Wallace Harrison, who installed it as a guesthouse on his Long Island estate in Huntington, New York. In 1987, with the building facing de-

IMAGES: © FOTOWORKS/BENNY CHAN. COURTESY PALM SPRINGS ART MUSEUM (TOP); COLLECTION OF PALM SPRINGS ART MUSEUM, ALBERT FREY COLLECTION 55-1999.2 (BOTTOM)

Albert Frey, photographed in front of the Frey House I (above). Though new, the aluminum panels feature dimples like the originals (left).

molition by a new owner, two New York architects—Michael Schwarting and Frances Campani—rallied to save it and, working with students, installed it in 1994 on the campus of the New York Institute of Technology in Central Islip. With the looming closure of that campus in 2004, the house again faced uncertainty. Schwarting and Campani created a nonprofit foundation, bought it for 10 dollars, and tried to land the house on another New York site. After that fell through, they were approached by Palm Springs advocates and its museum, where it physically joined the collection in 2017. Preservation of Modernism remains an urgent issue in the Palm Springs area; after he sold it, Frey's 1940 house was unceremoniously demolished in 1962, a major loss to architectural history. Frey's second house, built in 1964, is now owned by the museum.

The Aluminaire has been taken apart and put back together at least four times (Harrison moved it once, intact, but felt obliged to make many modifications to Frey's original design). "None of it is welded. It's all bolted," says Campani. "The rudimentary Frey plans are actually quite accurate, but they are very simple. A lot of Frey details exist about how the sills work and the furniture gets built."

Campani and Schwarting put together a full set of construction documents for the house as they took it apart in 1987. The ground floor features a drive-through garage and entrance hall, where the house's boiler was prominently installed as a piece of technological art. An open stair leads to the second floor, which includes the double-height living and dining rooms, kitchen, and bedroom and bathroom. The third floor has a library, with a bathroom that protrudes as an object into the living room volume (Campani says that, among the house's critics over the years, Reyner Banham especially deplored the third-floor bathroom's prominence).

The Aluminaire is many things, but it may be the first "circular economy" house designed for disassembly that has actually demonstrated the principle. Many of the materials are original, such as the steel windows, while others, such as the garage doors, have been remade by the original suppliers. The interior featured an innovative fabric, Fabrikoid, manufactured by Dupont as an artificial leather and, according to Schwarting and Campani, used by Frey to avoid painting and make cleaning easy. Elsewhere, unfinished plywood wall panels add structural rigidity and lend the house a contemporary resonance.

Although visitors cannot access the house's interior, they can glimpse the influence of Le Corbusier in the six exposed aluminum structural columns and 3-inch-thick aluminum-clad curtain wall. Paul Goldberger, in the essential and jam-packed catalogue for the modern-day exhibition, calls Frey "Corbusier's first American acolyte," and reminds us of the Aluminaire's design debt to Corbusier's 1927 Maison Citröhan in Stuttgart (a bit more substantial a dwelling, but the structural diagram and thin facade are unmistakable precursors).

Both Corb and Frey were focused on the same project: an affordable house, easy to mass-produce, that adapted emerging technologies to quicken the slow pace of traditional housing construction (Frey wrote many articles on this topic with Kocher for RECORD). The Aluminaire's shiny, unanodized aluminum panels are new but true to the original—even the dimpling in the panels adheres to the original, a fabrication outcome that Frey avoided in later buildings, where he switched to heavier gauge, corrugated aluminum siding.

Unfinished metal cladding reemerges in California architecture now and then for similar aims, as in Frank Gehry's 1968 Davis Studio and Residence in Malibu, where he used galvanized corrugated steel, or Pierre Koenig's metal-wrapped 1994 Schwartz House in Santa Monica. This kind of architectural experimentation, which colored Frey's long career, is rare these days in Palm Springs, where "midcentury" has mostly become a style choice expressed in EIFS and unfortunate pops of color. These are crass and misguided interpretations of Frey's Modernist imperatives, which remain as fresh as they were in 1931. ■

Russell Fortmeyer is a sustainability consultant and former RECORD *editor who lives in Los Angeles.*

PHOTOGRAPHY: © FOTOWORKS/BENNY CHAN, COURTESY PALM SPRINGS ART MUSEUM (LEFT); JULIUS SHULMAN / J. PAUL GETTY TRUST. GETTY RESEARCH INSTITUTE, LOS ANGELES (RIGHT).

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Exit Strategy

Allowing single-stair apartment buildings would bring a variety of benefits, writes **Alex Armlovich**.

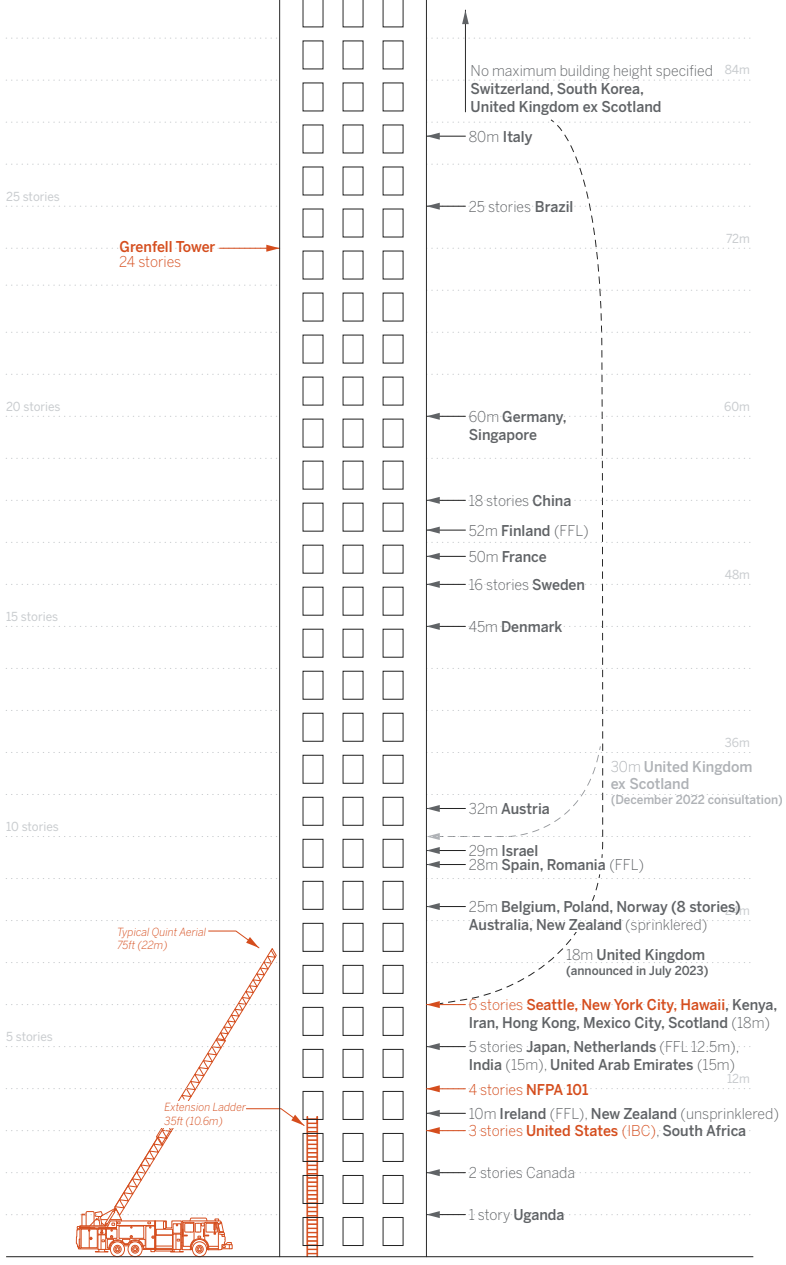
AMERICAN land-use reformers intent on addressing present-day housing shortages have, for the last decade, focused their efforts on amending zoning codes—the very rules that gradually downzoned most urban land in the U.S., effectively outlawing multifamily housing, spurring suburban sprawl, and fanning the current crisis. Recently, however, a group of young architects and planners has brought attention to another code barrier that limits design options for large multifamily buildings: the multiple egress routes mandated by most American building codes. The argument, in short, is to re-legalize single-stair apartment buildings, also known as "point-access blocks"—a typology that was once commonplace and remains so in much of the world, including the European Union, where fireproof single-stair designs are allowed. If combined with zoning reform, such code reform would enable attractive, light-filled multifamily housing to be built cost-effectively on countless urban sites that would otherwise be developed as single-family homes.

Commentators often wonder why new apartment buildings across the United States tend to look alike, not-so-subtly implicating architects and developers. One key reason is that decisions around organization and massing are prescribed by, or strongly incentivized by, regulations. In the limited areas where zoning codes allow for apartments, these rules have given us the notorious "five over one." In code lingo, these are a Type V light wood frame of up to five stories built over a single story of Type I fireproof podium (typically steel or concrete), with a double-loaded corridor and a stair at each end. Long, windowless corridors slice through the middle of deep floor plates. Non-corner units only have windows on one side, opposite the entry door—favoring studios and one-bedroom layouts.

By contrast, single-stair buildings across Europe tend to have shallower floor plates, "floor-through" light on at least two sides of each unit, and a shared central courtyard. Older American cities also feature outstanding examples of these "garden apartments": New York's first garden-apartment blocks, in Jackson Heights, Queens, were celebrated in ARCHITECTURAL RECORD in 1920 for their array of unit layouts and variety of outdoor spaces. Indeed, single-stair designs deliver more of the light, air, and acoustic privacy typically provided by detached single-family buildings. Light on two or three sides facilitates multibedroom suites even in compact floor plates. These buildings also facilitate community building. In Jackson Heights, for example, whole-block developments are composed of many buildings in series, each governed by its own co-op board, and each, with 20 or so units arranged around a single stair, is small enough for residents to get to know each other. (New York and Seattle are the only two American cities that continued to allow single-stair buildings throughout the 20th century.)

Single-stair designs also unlock economically feasible multifamily development on small infill lots. On such sites, two interior stairwells and a corridor would take up so much of the allowable floor plate that multifamily buildings are rendered infeasible unless adjacent lots are acquired. On some large lots, by contrast, the greater floor-plan efficiency of single-stair designs would probably be offset by the higher cost of fireproof construction and the need for a greater number of elevators, as double-loaded corridor designs enable one elevator to serve many units. In these cases, five-over-ones may continue to be built unless construction costs change dramatically. At the same time, developing large lots with multiple single-stair buildings would unlock a unique amenity: park-like shared interior courtyards. If on small lots, single-stair designs compete on both cost and quality, on large lots, they compete on quality.

Ultimately, building-code reform complements zoning-code reform. A building code allowing single-stair buildings can't do much if zoning codes still ban multifamily designs in the first place. But allowing multifamily buildings in areas currently zoned for single-family homes may be more palatable to neighbors if they are faced not with the prospect of



A diagram illustrating the maximum prescriptive height of single-stair buildings (above).

monolithic, whole-block five-over-ones but rather with narrower, family-friendly buildings. Even at similar height and average density, multiple 20-unit single-stair buildings form more neighborly, less anonymous interior communities than one enormous whole-block apartment building with 100 units sharing a hallway.

Why, then, did the U.S. embark upon a path so different from Europe's? Quite simply, there was a radical divergence in fire-safety approaches during the 20th century and insufficient exchange of best practices. As Stephen Smith, director of the North American Center for Building, argues, American approaches aim to make combustible light wood-frame buildings easier to escape by providing multiple paths of egress; European codes, by contrast, require fire-resistant materials and compartmentation to prevent fires from spreading in the first place. Statistically, the evidence is clear: fire-death rates are consistently lower in Europe than in the U.S. and Canada. Nonetheless, it may be prudent to cap the height of single-stair buildings to ensure egress via fire ladder. This is the approach followed both by New York and Seattle, which cap the height of single-stair buildings at six stories while requiring fire-rated structures and sprinklers.

What outcomes might we expect from allowing six-story point-access blocks throughout the country? Based on evidence from New York and Seattle, double-loaded corridor designs would probably outcompete point-access-block designs for new buildings only on sites where neighborhood amenities and transit access push up land prices to the point that they support building heights beyond the reach of a fire ladder. But these places are exceptional, not typical. Today, the outlook for reform of both zoning and building codes is brightening. Pro-housing coalitions across the United States have won early battles to re-legalize multifamily housing in states like California, Montana, Oregon, Minnesota, and others. Now building-code reform is gaining steam too. Honolulu quietly re-legalized single-stair apartments in 2012, copying Seattle's code. Last year, California, Oregon, and Washington each successfully legalized single-stair construction, effective in 2025 or 2026. Half a dozen other states are considering enabling legislation. Reform is on the march.

104 years ago, this publication celebrated the liberation of New York from dark, airless tenements by new point-access

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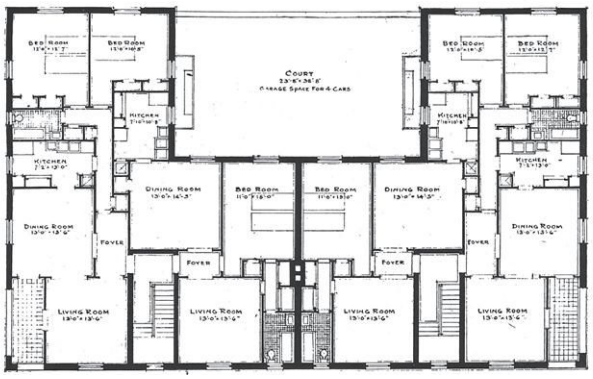
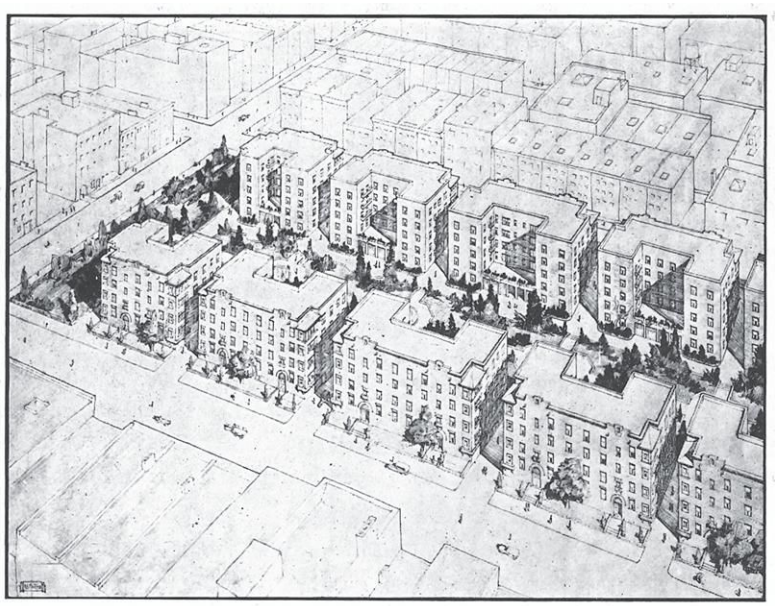


blocks. Today, new adaptations of the same typology continue to win design competitions across the European Union. Single-stair construction commands the support of the Fire Department of New York and the Seattle Fire Department, and state governments across the West Coast have acted accordingly to legalize it. Why not do so across the rest of the United States too? ■

Alex Armlovich lives in New York and leads the housing-policy team at Niskanen Center, a Washington, D.C.–based think tank.



Andrew J. Thomas, the prolific housing architect, was lauded in the August 1920 issue of Record for Operation No. 8, a series of apartment buildings in Queens, New York (both above and opposite).

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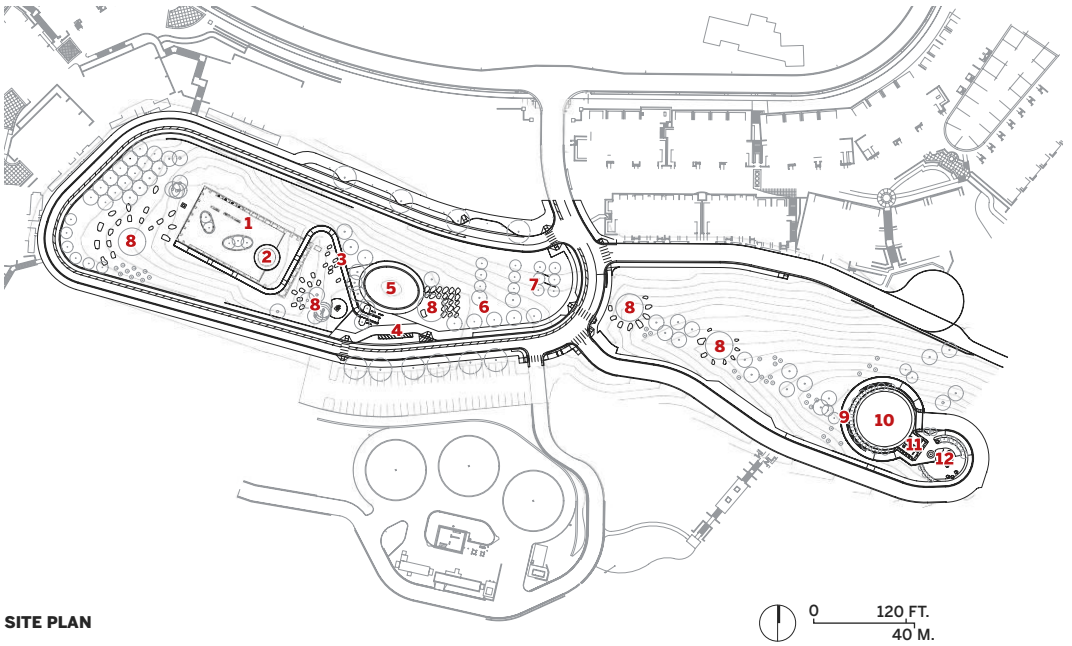
A PAIR OF PARKS BY HOOD DESIGN STUDIO OFFER PANORAMIC VIEWS OF SAN FRANCISCO BAY. **BY MATT HICKMAN**

Yerba Buena Island's Panorama Park, features Hiroshi Sugimoto's *Point of Infinity*, with views of the Bay Bridge and San Francisco skyline.

FOR MANY Bay Area residents and visitors, the craggy outcrop in the middle of San Francisco Bay known as Yerba Buena Island is mostly experienced while inside an 88-year-old concrete tunnel. The 10-lane, double-deck Yerba Buena Tunnel carries Interstate 80 through the middle of the island, linking the eastern and western spans of the San Francisco–Oakland Bay Bridge. The 150-acre island—formerly the site of a U.S. Navy training station and currently home to a modest Coast Guard outpost—has long been utilized as a crucial piece of transportation infrastructure and is now in the infancy of its next use: a residential enclave unlike any other in the housing-strapped region.

Along with Treasure Island, its more sprawling neighbor constructed for the 1939 World's Fair, Yerba Buena Island is the focus of an ambitious scheme slated to be the largest housing development in Northern California, with 8,000 units planned in total, roughly a quarter of them affordable. Among the first elements to be completed are Yerba Buena's public green spaces, including a pair of newly unveiled parks, by Oakland-based Hood Design Studio, situated atop the highest point on the island.

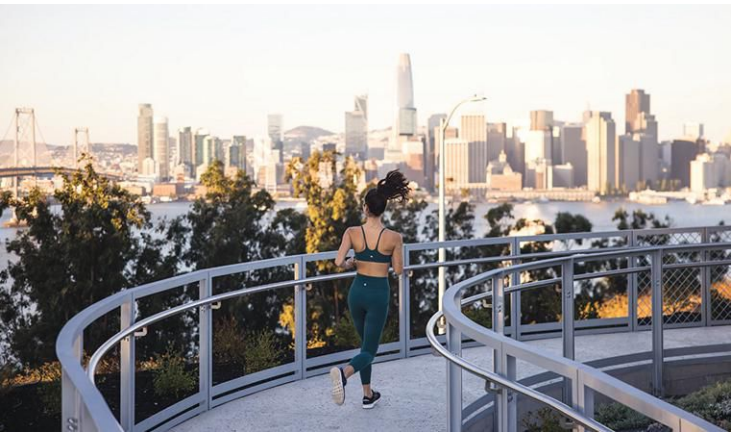
Sliced by Yerba Buena Drive, the two parks—



SITE PLAN

1 WEST HILLTOP PLAZA
2 *POINT OF INFINITY*
3 WALKWAY
4 ENTRY PLAZA & DROP-OFF
5 HILLOCK
6 WILDFLOWER MEADOW
7 GROVE & GATEWAY SIGN
8 HERITAGE TREES
9 ROUND OVERLOOKS
10 FIRE TRUCK TURNAROUND
11 ACCESSIBLE PARKING
12 EAST OVERLOOK/TANK GARDEN

PHOTOGRAPHY: COURTESY YERBA BUENA ISLAND



A curving raised walkway extends from an entry plaza and partially encircles Panorama Park.

Panorama Park to the west and Signal Point to the east—designed as "passive" space, so as not to undermine the main attraction: the previously rarely seen vista of the bay from the apex of this once largely inaccessible island. "You're basically sitting on top of the bridge," says Alma Du Solier, landscape architect and studio director at Hood Design Studio. "The views are so impressive that it almost feels like you *can't* do anything other than sit and admire them." The design, she says, shifted through the process to explore how to best take advantage of that experience. A grassy knoll, located at the middle of the site near a wildflower meadow and gridded cluster of coast live oaks, is the only space with the potential for frolicking. Accordingly, seating is abundant and includes a large circular bench crafted from durable ipé at Signal Point's overlook, as well as benches fabricated from eucalyptus wood salvaged from construction projects under way across the island. Strategically placed boulders, excavated from nearby sites where the island's hot-selling condo communities have gone up, also provide places to rest and take it all in.

Although structures comprising the old naval base have long since been demolished, remnants of the site's former life do still exist, including a 2 million-gallon reservoir built into the hillside in 1918. Accessible via a winding elevated walkway, the preserved tank's lid has been cut to create a perimeter wall around Panorama Park's observation plaza. Positioned atop a relic that Du Solier calls the "genesis of the project," the plaza is also the site of *Point of Infinity*, a monumental sculpture-cum-sundial by Japanese photographer and architectural designer Hiroshi Sugimoto. As Du Solier explains, the space was designed prior to the decision to place the 69-foot-tall, tapering stainless-steel sculpture there, leading to some modifications. "There's been some confusion among the public about whether the sculpture *is* the site and we were designing for it to be in a beautiful place. It's really kind of the opposite," she says: what they crafted the site for was to foster a sense of discovery. She hopes visitors feel that as they set foot on—and relish the awe-inspiring views from—the pinnacle of an island previously unknown to all but a few. ■

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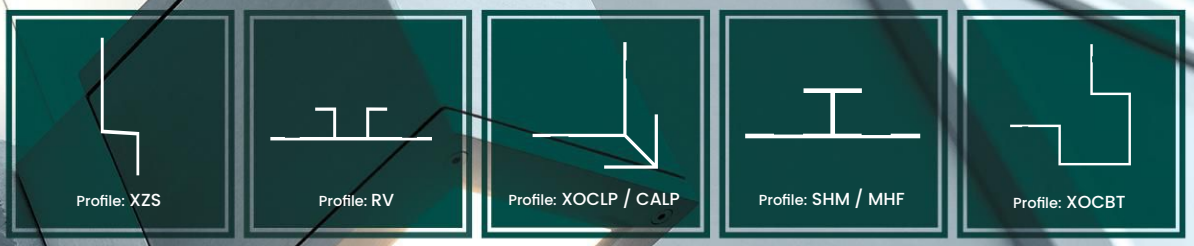

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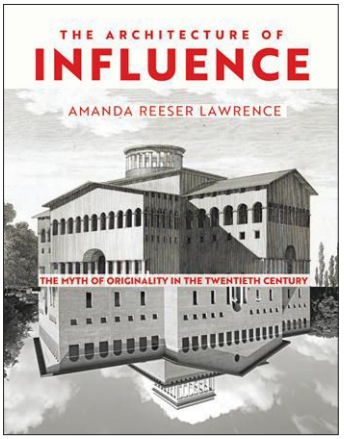
The Architecture of Influence: The Myth of Originality in the Twentieth Century, *by Amanda Reeser Lawrence. University of Virginia Press, 280 pages, $50.*

REVIEWED BY ERIC HÖWELER, FAIA

The ways we engage with architecture media are changing radically, as social feeds accelerate the volume of content and erode viewers' attention spans. This ubiquitous broadcast of architecture—as image—and its wholesale consumption raise important questions: How does this superabundance of architectural images change how we experience architecture? How does it affect modes of architectural production? Although architecture media largely focus on design *reception*, can they also affect design *conception*?

Amanda Reeser Lawrence's book *The Architecture of Influence* confronts some of these questions from a historical perspective, exploring the use of precedent, models, and sources in 20th-century architecture. By retracing multiple and multidirectional vectors of inspiration, collaboration, and imitation, she investigates disciplinary preoccupations with originality, the notion of genius, and the inevitability of influence in the mechanics of design.



Early in the text, Lawrence refers to literary critic Harold Bloom's 1973 book *The Anxiety of Influence*, whose premise is the impossibility of isolating creative processes from the larger body of preceding work, describing influence as "an anxiety-ridden struggle" between creators and their predecessors. She identifies such anxieties in Frank Lloyd Wright, who denied being inspired by anything beyond the natural beauty of organic forms. More recently, statements by Frank Gehry reveal a genuine concern with copying himself, as his signature architectural style tends to create an inescapable stylistic feedback loop. Despite an expectation within the profession for newness and the larger cultural value often placed on innovation, significant works by some of the best-known architects consistently rely on processes of citation and referentiality. Lawrence astutely reveals how practices of appropriation, duplication, and copying were not the exception but were rather an integral part of a pervasive norm.

In her survey of the 20th century, Lawrence organizes the book into seven chapters—"Replicas," "Copies," "Compilations," "Generalizations," "Revivals,"

"Emulations," and "Self-Repetitions"—each of which examines several case studies. In "Copies," she explores the many threads shared between Philip Johnson's Glass House (1949) and Mies van der Rohe's Farnsworth House (1951). Curiously, while Johnson's house was explicitly inspired by Mies's design for Dr. Farnsworth—he even went so far as to publish an article in *The Architectural Review* saying as much—Johnson's house was completed first. "The copy precedes the original," Lawrence writes. As this case illustrates, the intertwined and overlapping design and construction timelines of the two residences, which spanned years, and the fact that Johnson and Mies were at various times collaborators and competitors, meant that the two architects influenced each other in complex and nonlinear ways.

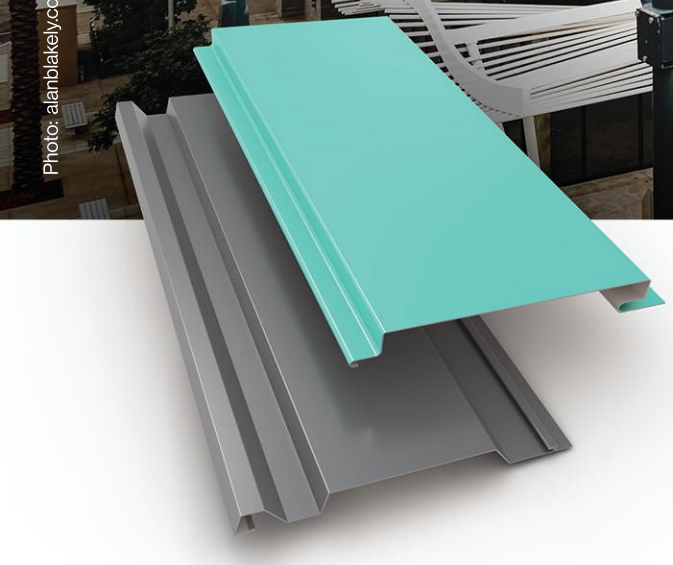
Lawrence's analysis often presents pairs of major works generally understood as original and copy, such the House of Education (1779) by Claude-Nicolas Ledoux and the College of Architecture (1986) by Johnson and John Burgee (both projects are featured on the book's cover, as mirrors of one another). But she also explores figureheads, like Le Corbusier, in the context of derivative work, such as that of the New York Five; or masters and their apprentices—for example, Frank Lloyd Wright and his prolific acolytes Richard Neutra and Rudolph Schindler. In each case, Lawrence reveals the intricate and inescapable nature of referentiality within design. She also shows how more recent works read, revise, and reinterpret sources differently from older ones, since history is always filtered through contemporary media that frame our engagement with the past.

"In interrogating the unoriginal with the same intensity of critical force typically reserved for the unprecedented," she writes, "we underscore not simply the inevitability but the significance of influence as a central feature of 20th-century architecture." *The Architecture of Influence* reveals the tangled web of processes that underpin much of the architecture of the last century, despite the cultural mythologies surrounding the solitary genius. By demonstrating the sheer complexity of influence, Lawrence also provides a deeply revealing portrait of the means and methods of design culture that have only intensified in the present. While vectors of influence between architects of the 20th century were publications and journals, now those vectors are fast-paced online platforms, social media algorithms, "likes," and "shares." Lawrence's book is "not only a theorization of a set of historical ideas, but an implicit guide for their implementation." For her, a book about the history of influence is also an essay on modern-day authorship, media, and technology. Considering how the old influences the new inevitably also asks, What does it mean to *imagine* today? ■

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

Industrial Chic

Photo: alanblakely.com



Colorful metal panels mimic signature sculpture

Parc Haven features industrial-style PAC-CLAD Highline B2 metal cladding that references the adjoining train tracks. A punch of colorful Flush panel highlights nod to Symphony Park's Pipe Dream sculpture sited directly across the street.

View the case study and video

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Hassan Fathy designed this *khan*—roughly translated, a trading post and inn—in New Gourna Village in Luxor, Egypt. With construction beginning in the late 1940s, New Gourna was conceived as housing for thousands of Egyptians removed by the government from their homes near ancient sites. Though Fathy sought to root his architecture in regional traditions, many resented the relocation process and refused to move to New Gourna.

By entering, you have a chance to win a $500 Visa gift card. See the complete rules and entry form online at architecturalrecord.com/guessthearchitect.

PHOTOGRAPHY: © THOMAS LEDL. WIKIMEDIA COMMONS (TOP); MARC RYCKAERT. WIKIMEDIA COMMONS (BOTTOM)

The biennial Light+Building trade fair returned to Messe Frankfurt's convention center in March to showcase the latest innovations in lighting design and technology. Electrifying luminaires emerged from collaborations with renowned architects, and a spotlight was trained on sustainability, from the products to the booths designed to display them. The show came on the heels of the announcement that Light+Building would expand into North America, after bringing LightFair into its international portfolio.

BY LEOPOLDO VILLARDI

Avro

Spurred by the needs of remote work, Martinelli Luce's dimmable suspension lamp puts function back into form. Avro's discreet underside socket and accompanying cubical extension block bring electricity where it is needed most—be it a dining table or an office desk. Searching for an available outlet will never again be a struggle.
martinelliluce.it/en

Atomos Slim

Lucifer Lighting has shaved 2" from its Atomos housing and added more lumen output to its pinhole downlight. This feature-rich fixture, with wireless functionality, offers a variety of apertures, both flanged and trimless.
luciferlighting.com

Nebbia

Making its debut at Light+Building and inspired by the atmospheric fog of Milan, this family of round reeded-glass fixtures—available in five hues and two sizes—is the result of a collaboration between Italian studio Park Associati and Deltalight.
deltalight.com

Hoy

High-tech architect Norman Foster is the force behind Artemide's recessed-lighting system, Hoy, which boasts a slender 4" width. Mix-and-match modules—four different spotlights and a range of linear refractors and diffusers, as well as building sensors—are available for an intentional, integrated look.
artemide.net/en

w171 Alma

Stockholm-based firm Tham & Videgård, a 2009 Design Vanguard, celebrates light and shadow with Alma. This aluminum shade, available unfinished or with a white powder coat, takes the form of a sine wave that is further accentuated by a single silver-tipped bulb. Install it as a pendant or wall sconce.
wastberg.com

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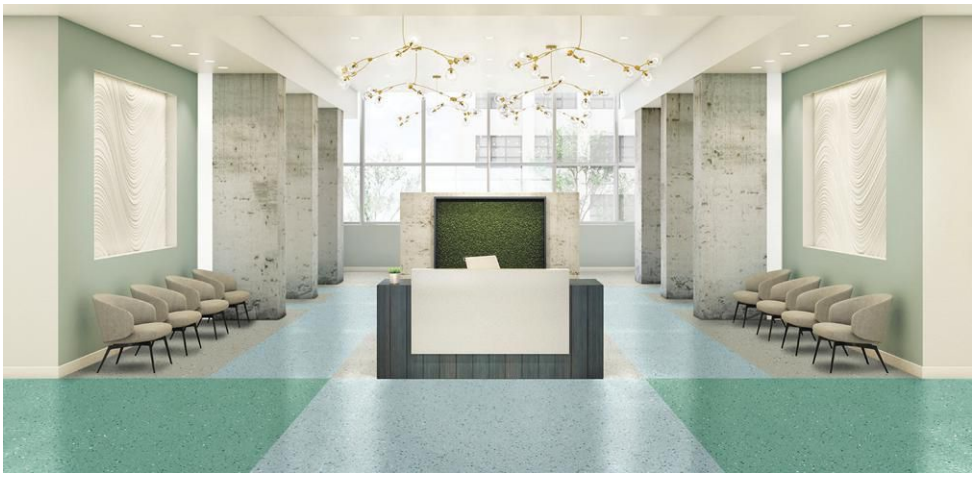
commercial.tarkett.com



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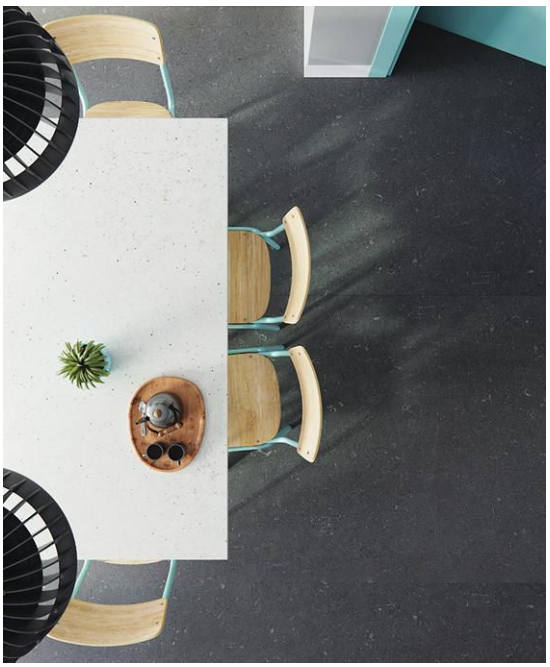
This homogeneous vinyl sheet has a true through-pattern that provides even wear, consistent appearance, and superior gouge and abrasion resistance to withstand heavy rolling-load traffic. It coordinates across the Armstrong Flooring Continuum Solutions for flexibility and countless design options.
ahfproducts.com

Art Select

In June, Karndean Designflooring will add dozens of new designs to its Art Select collection, highlighted by two that replicate the gemstone onyx. The luxury vinyl tile (LVT) product is waterproof, scratch-resistant, and easy to clean, with a commercial-grade 30-mil wear layer. Available in glue-down and rigid core for installation.
karndean.com

ForestFusion

For domestic or commercial spaces, this new LVT collection features wood grains in a palette of warm neutrals with enhanced color and pattern clarity and lightly textured surfaces. Tiles come in a plank size of 7" x 48", a 2mm thickness, and a 12-mil wear layer, and offer glue-down installation.
lxhausys.com



Silestone

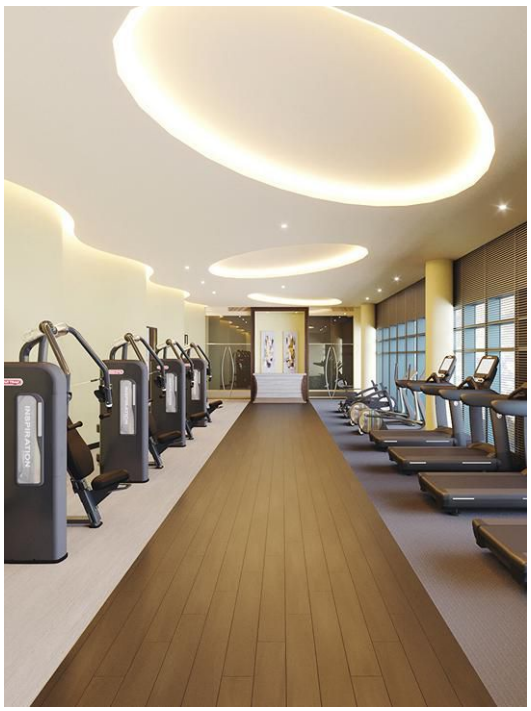
Le Chic (above, right) and Urban Crush (above) are new additions to the Silestone portfolio of resilient and high-performing low-silica mineral surfaces. Their patterns feature expressive veins made possible by Cosentino's new molding system, and metallic accents. At almost zero porosity, these surfaces are resistant to moisture, stains, and acid, as well as scratches and impact.
cosentino.com

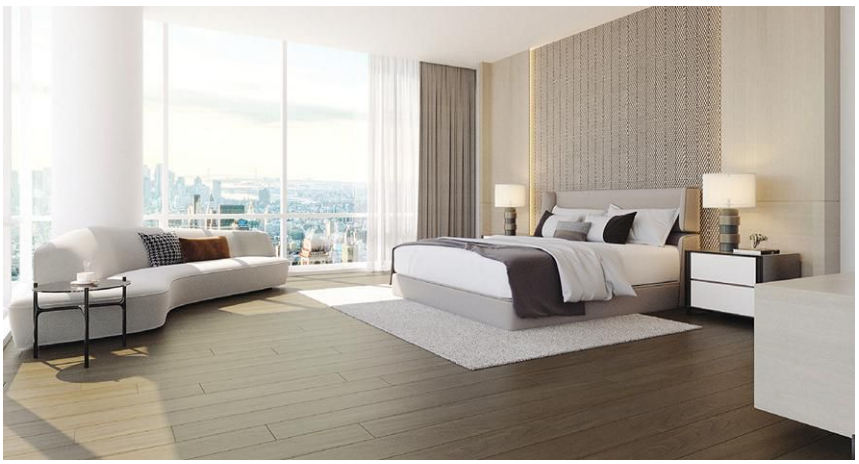
Flexco

With the 2024 launch of 40 new colors, Flexco has introduced an updated color system. Specifiers can choose from more than 100 hues in three palettes: FlexTones, which features solid colors; SpexTones, with speckled patterns; and Evolving Styles, offering marbled designs. These expanded palettes coordinate across flooring, stair treads, and wall bases for commercial spaces.
flexcofloors.com

Marmoleum Solid

Marmoleum Solid by Forbo offers a balanced color palette in several ranges. The mainly unicolored surfaces—whether solid, with a shimmer, or with random visual effects—effortlessly blend with contemporary trends. The improved surface finish keeps its appearance longer and is smoother, for easier cleaning.
forbo.com





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The Shepherd campus includes a sculpture garden featuring works by the late Charles McGee (this image).

It Makes a Village

Adaptive-reuse projects by Peterson Rich Office and OMA anchor a burgeoning arts district in Detroit.

BY MATT HICKMAN

WHEN LOOKING TO EXPAND, most commercial art galleries knock down a couple of walls or open a satellite location in an up-and-coming neighborhood where the rent is cheap and foot traffic is promising. Anthony and JJ Curis, the husband-and-wife collectors whose flagship gallery, Library Street Collective, is a mainstay of the downtown-Detroit cultural scene, opted to take a decidedly more radical approach by laying the foundation for a nascent ground-up arts district in a relatively sleepy corner of the city. In the East Village neighborhood, the Curises not only established a backdrop in which to stage larger, more ambitious exhibitions but to grow the gallery's public programming and community-building efforts, all the while providing a critical asset to the city's creatives and arts nonprofits: raw space.

It doesn't hurt that the pioneer-ambassadors of this new enclave, dubbed Little Village, have backgrounds in real estate and hospitality, or that the Curises tapped a pair of architecture firms known for adaptively reusing spaces as art venues. Brooklyn's Peterson Rich Office (PRO) and the New York studio of OMA have designed the first two of what will eventually be multiple venues spread across a section of the neighborhood enveloped by swaths of urban prairie and dotted with abandoned buildings awaiting new use.

Opening this month as an anchor project of the Little Village master plan developed by PRO and New York–based multidisciplinary design firm OSD is the Shepherd, a multifaceted arts space housed within the former Good Shepherd Church. Dedicated in 1912, the Romanesque-style Catholic house of worship was shuttered by the Archdiocese of Detroit in 2016. As PRO's Nathan Rich—who presented the project at RECORD's 2023 Innovation Conference alongside fellow founding partner Miriam Peterson—explains, the building's role as an "anchoring institution" within the East Village remains much the same in its second life but minus the incense and kneelers. "The Shepherd is still

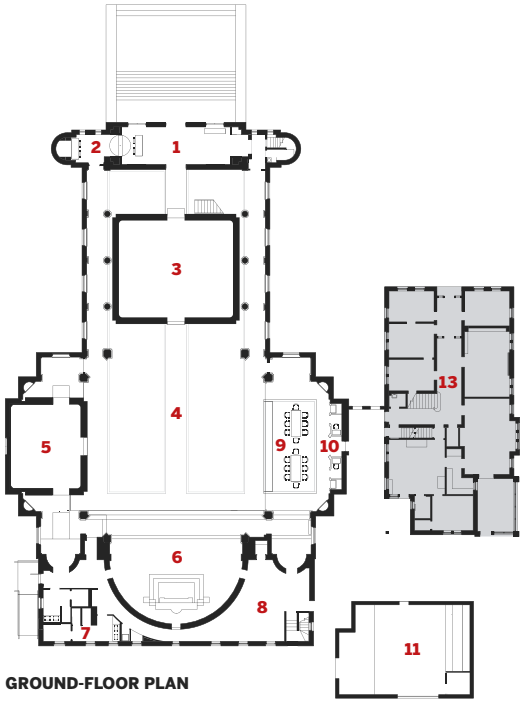
PHOTOGRAPHY: JASON KEEN, COURTESY THE ARTIST'S ESTATE AND LIBRARY STREET COLLECTIVE

Installation view of *Play Patterns II* (2011), a mixed-media collage by Charles McGee in the Shepherd's main gallery (left).

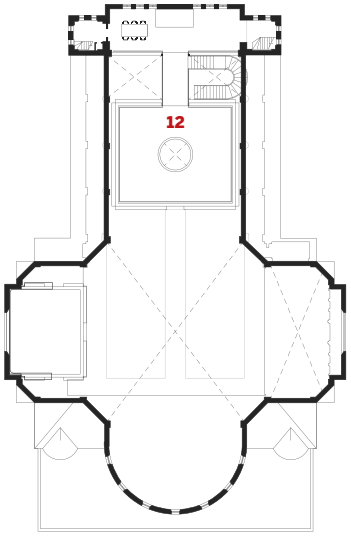
going to bring people together—not around religion, but the arts," he says.

The exterior facade of the historic church, which was in good condition when the project commenced, was largely preserved; the sole intervention by PRO was the addition of a thin weathering-steel "halo" above the front entrance, subtly hinting that *something* inside has changed. And indeed it has—gone are the pews, a cantilevered choral mezzanine, hanging light fixtures, religious iconography, and non-original ornamentation. Inserted into the light-filled space are two white-cube galleries hosting the Shepherd's inaugural exhibition, a survey of late artist Charles McGee, presented in collaboration with the Museum of Contemporary Art Detroit. At 1,200 square feet, the main volume, steel-framed and finished in textured plaster, is situated in the central nave, punctured by an oculus that provides views up to the church's soaring, vaulted ceiling. Framing the oculus is a newly created mezzanine level providing flexible programming space. Half the size of its counterpart, the second gallery is in an adjacent transept. Meanwhile, the church's other transept has been reimagined for a branch location of the Black Art Library curated by Detroit arts-educator Asmaa Walton. Among the interior elements that have been preserved

1 LOBBY/ENTRY
2 OFFICE
3 GALLERY 1
4 EVENT SPACE
5 GALLERY 2
6 STAGE
7 RESTROOMS
8 SACRISTY RECEPTION
9 TRANSEPT LIBRARY
10 CONFESSIONALS
11 CAFÉ
12 MEZZANINE
13 ALEO BED & BREAKFAST



GROUND-FLOOR PLAN



MEZZANINE PLAN

0 20 FT.
6 M.

IMAGES: JASON KEEN. COURTESY THE ARTIST'S ESTATE AND LIBRARY STREET COLLECTIVE (TOP); © OMA AND LUXIGON (OPPOSITE, TOP AND MIDDLE); OMA (OPPOSITE, BOTTOM)

are floor tiles produced by Pewabic Pottery, a historic Detroit ceramic studio located just blocks away from the Shepherd campus.

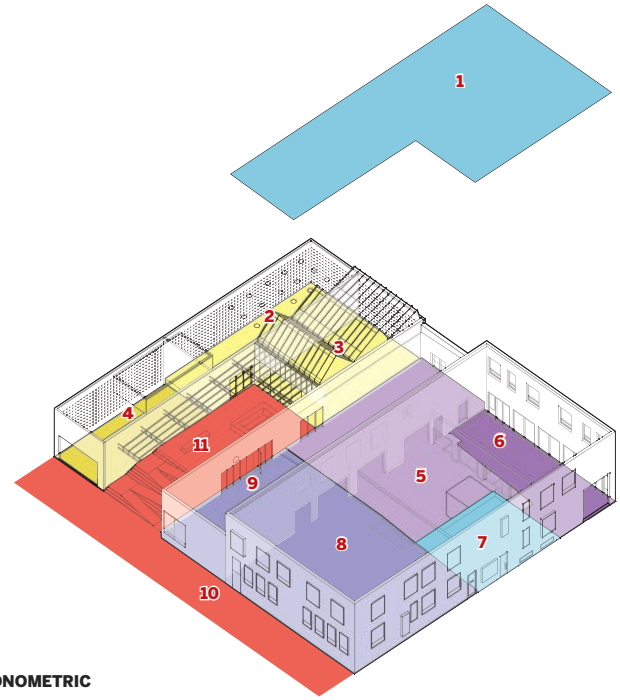
There are clever moments throughout. The church's confessional booths have been repurposed as multimedia listening nooks for the library; a revolving bookcase provides camouflaged secondary access to a tucked-away office; and an adjacent garage, which once housed the hallowed vehicles of resident priests, will be converted into a cocktail bar named Father Forgive Me. That cheekily monikered project is just one of several hospitality elements of Little Village. Housed within the church's former rectory is ALEO, an art-stuffed bed-and-breakfast. Across the way, a pair of residential structures has been rehabbed—and linked by a two-story deck—by Detroit studio Undecorated to create BridgeHouse, a commercial venue focused on the culinary arts.

Major elements of the immediate church grounds and surrounding block, resuscitated by OSD founder and creative director Simon David and his team, are a sculpture garden—named in honor of Charles McGee, and permanently featuring large-scale work by him—and a skate park, designed by Tony Hawk and artist McArthur Binion. There's also the Nave, a forlorn alleyway-turned-pedestrian promenade that connects the new campus to the neighborhood on what was once an unwelcoming and uneven mess of weeds and surface parking lots. Along with improving accessibility to the site, acknowledging its context was key. "You see this texture in the neighborhood of overgrown lots and broken glass and masonry— those things were beautiful to us as well," says David. "We tried to harness that earthiness and decay and reinvention—so much the story of Detroit—and turn them into design."

To that effect, recycled-glass mulch found in a meditation loop encircling a swath of open lawn mirrors the colors found in the stained glass of the church; the paving is made from reground brick salvaged from the ruins of an old convent located across the street from the Shepherd. (In a project now under way, led by Lorcan O'Herlihy Architects, a portion of that crumbling structure has been retained, and the site will be transformed into the new home of Library Street Collective's sister gallery, Louis Buhl & Co.)

A five-minute walk from the church

A rendering shows the south building facade of Lantern (top) contrasted with its pre-renovation condition (middle).



AXONOMETRIC

1 UPPER-LEVEL ARTIST STUDIOS
2 COUP D'ÉTATE BOUTIQUE
3 COLLECT BEER BAR
4 CAFÉ FRANCO
5 SIGNAL-RETURN GALLERY
6 SIGNAL-RETURN PRODUCTION SPACE
7 ASSEMBLE SOUND GALLERY
8 PASC PRODUCTION SPACE
9 PASC GALLERY
10 PUBLIC ALLEY
11 COURTYARD

The BridgeHouse looks out on a skate park (right). The Shepherd hosts a rounded steel stairway to the mezzanine level (opposite, right) and Little Village Library (opposite, left).

PHOTOGRAPHY: JASON KEEN, COURTESY LIBRARY STREET COLLECTIVE (3)

grounds at the corner of McClellan and Kercheval Avenues is another building revived as a mixed-use art space. Dubbed Lantern, OMA's contribution to Little Village is a 23,850-square-foot project that encompasses an assemblage of three connected structures that previously housed a commercial bakery and warehouse. Each section of the tripartite building was built in a different era and with different materials, leaving the entire complex in varying states of disrepair—the southern volume, a concrete-block structure, was completely missing its roof. As partner-in-charge Jason Long explains, this provided a poser unlike adaptive-reuse projects he's worked on elsewhere (POST Houston, for instance, and an outpost of the Centre Pompidou in progress in Jersey City, New Jersey). "Grappling with how to deal with the facade, roof, and height differences was a bit more complex than those projects," he says, also noting that another challenge arose from accommodating multiple tenants with distinct needs. "A large part of the thinking was trying to orchestrate where tenants could be, and how the various entries and moments of connection could make the whole complex work together."

As for Lantern's current tenants, they include Signal-Return, a nonprofit letterpress print shop, and PASC, an organization whose new space in the building will be Detroit's first studio and gallery dedicated to artists with developmental disabilities. Work is set to complete later this year on the 4,000-square-foot southern space, which will be home to a boutique, bar, and café, and which lends the

project its name: in lieu of windows punched into the facade, the structure's CMU walls are perforated with 1,353 holes, each waterproofed and filled with two glass pavers, inside and out. At night, these glow, transforming the building into a neighborhood beacon. At the rear of Lantern is a public outdoor courtyard. "All the programs essentially feed into it, partly to provide accessibility to them but also so the different tenants have a place to come together," says Long.

With the Shepherd campus and Lantern now mostly complete, there is the question of whether out-of-town art hounds, or even locals, will make the trek to an emerging cultural district removed from Detroit's downtown core—it could prove to be a tough sell. In the meantime, the Curises are moving ahead with other efforts in the neighborhood, including the revamp of the Stanton Yards marina, led by OSD in collaboration with SO–IL, with an adaptive-reuse component. This will no doubt continue to attract architectural talent wishing to take part in what Miriam Peterson calls a collaborative and "almost curatorial approach to developing the site," she says. "The project is, in a sense, like a big group show." ■

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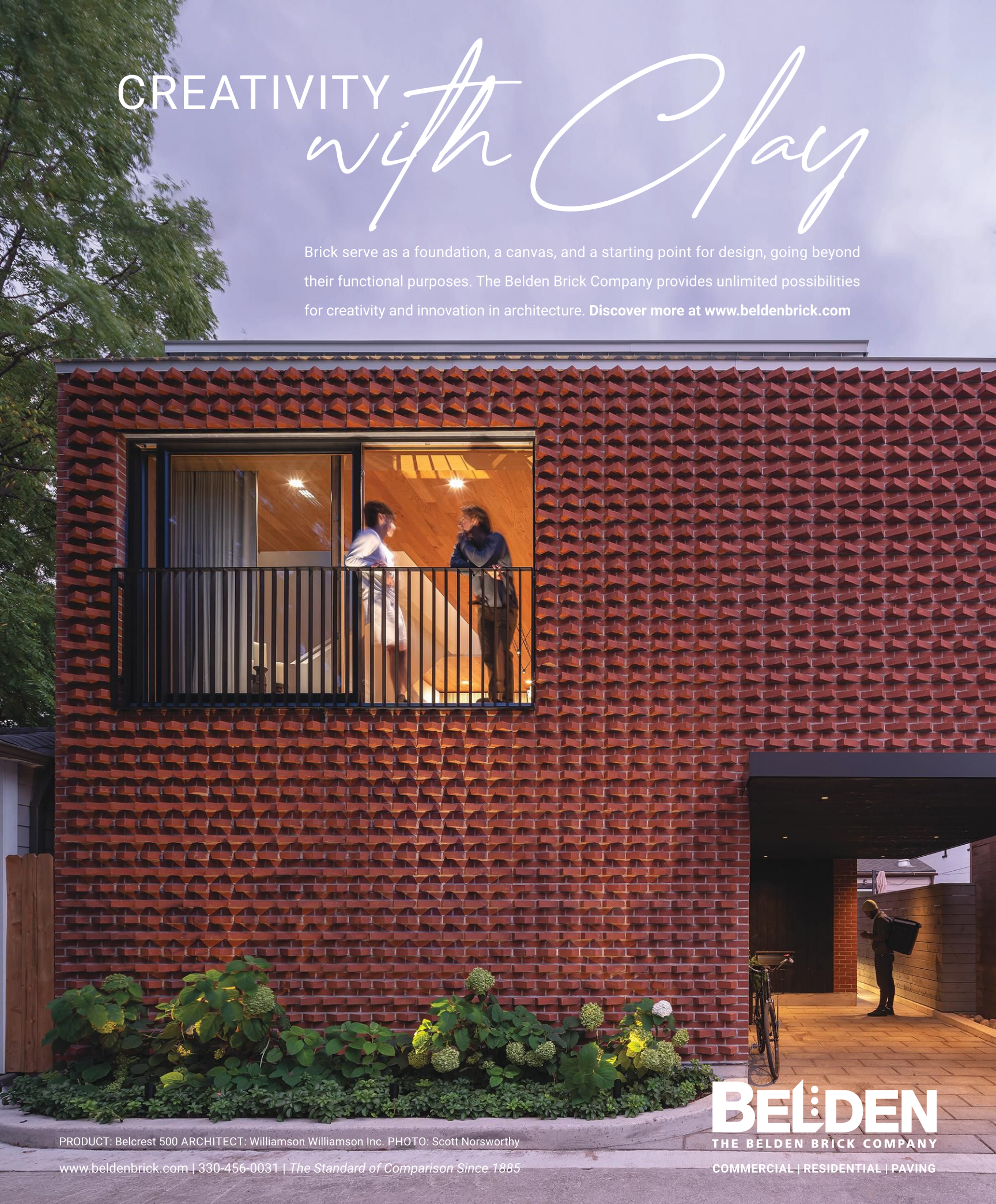

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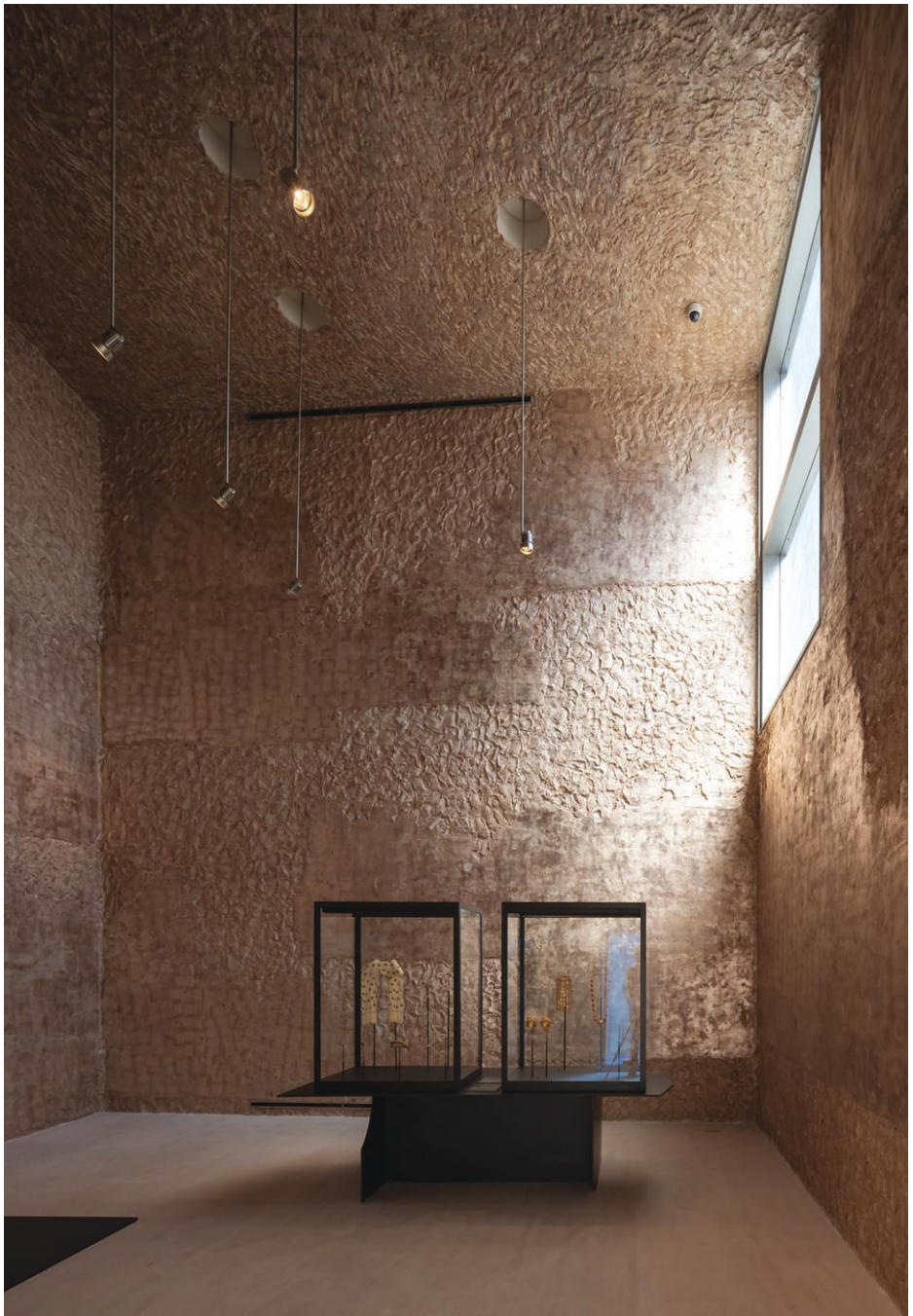
History in the Making

A series of new and refurbished structures revitalizes Bahrain's UNESCO World Heritage Pearling Path.

BY IAN VOLNER
PHOTOGRAPHY BY IWAN BAAN

IN A SEA of historic buildings, the Pearling Path's new structures command attention (this image).



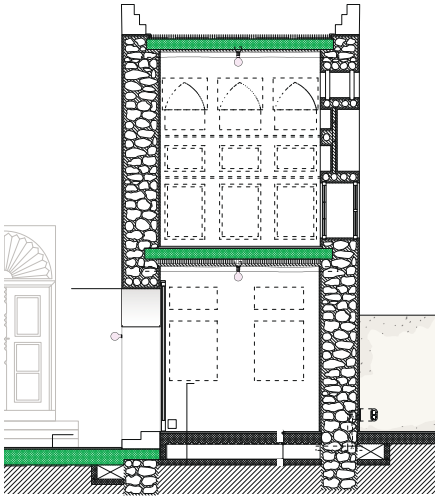
"THE VERY highest position among all valuables belongs to the pearl," wrote Pliny the Elder. "But those are most highly valued which are found [in] the Persian Gulf . . ." To the Roman chronicler's fellow citizens in the first century CE, and to their contemporaries throughout the known world, the tiny archipelago of Tylos—known today as Bahrain—was famous for the treasures hiding in the shallow, cloudy waters that surround it. Sustained by its signature product, and by a market that was global in reach long before the advent of globalism, the city-state off the coast of the Arabian Peninsula continued to thrive for nearly two millennia after Pliny's time.

Until, unfortunately, the emerging global economy caught up with it. "Everything here was built around the industry," says architect Noura Al Sayeh. "And then, in the 1930s, it collapsed." After the Japanese developed a method for cultivating artificial pearls, Bahrain found itself in eclipse—but, as Al Sayeh explains, the extraordinary urban culture that the pearling business had helped create remained very much intact. "So many of the buildings here represent some aspect or other of that society," she says. It's a legacy that Al Sayeh—alongside a lengthy list of collaborators—is now endeavoring to preserve and to celebrate.

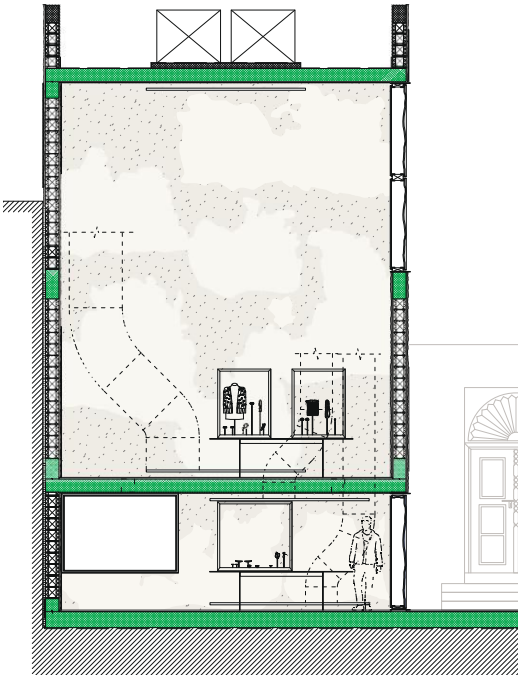
Officially open to the public this spring, the Pearling Path is a more than two-mile-long corridor of historic landmarks, new infrastructure, and hybrid contemporary-and-restored buildings, running from the old harbor through the bustling heart of Muharraq, the older, denser twin city to the current capital of Manama. Following extensive advocacy by Bahrani officials, including former prime minister Sheikh Khalifa bin Salman Al Khalifa, the United Nations declared the ancient pearl-trade district an official World Heritage Site in 2012.

Two years prior, Al Sayeh had helped organize Bahrain's debut pavilion at the Venice Architecture Biennale, marking the start of her still-ongoing role as Head of Architectural Affairs for the country's Authority for Culture and Antiquities. The Pearling Path represents the cumulative results of Al Sayeh's now 14-year effort to transform how Bahrain understands its own past, and how the world understands Bahrain. "In terms of urban regeneration, it's been such a huge opportunity," says the architect.

Four parking structures; 17 public squares; a pedestrian bridge; a visitors center: the new construction along the Pearling



SECTION — EXISTING BUILDING



SECTION — NEW BUILDING

THE SOUK'S smooth concrete erodes at the edges (opposite, top). Similarly, the Pearl Museum (above) has cladding and inner walls (opposite, bottom) that modulate between flat and textured.

Siyadi Majlis Pearl Museum | Credits

ARCHITECT: Studio Anne Holtrop — Anne Holtrop, principal; Mohammad Salim, Constança Girbal, project architects

ARCHITECT OF RECORD: Ismail Khonji Associates

ENGINEERS: Ismail Khonji Associates (structural); Sayed Jaffar Majeed (m/e/p)

CONSULTANTS: Aïnu (exhibition); Studio Jonathan Hares (graphic design)

GENERAL CONTRACTORS: Amoayyed Interiors (civil); Bakhowa Group (interiors); Restaura (exhibition); Group Galrão (stone)

SIZE: 14,200 square feet

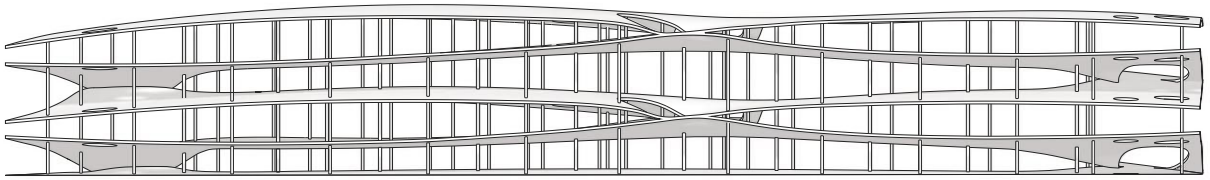
COST: $1.8 million (construction)

COMPLETION DATE: February 2024

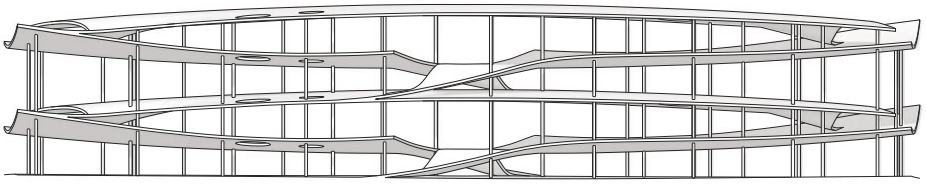
CONCRETE surfaces split to form multiple parking levels (left), while a stair corkscrews through them to offer vertical circulation (opposite).

Path is intended to complement the 15-odd original houses, mosques, and marine oyster beds listed in the UNESCO-designated area, providing extra amenities and points of interest for visitors and locals alike. Dividing the sizable brief into chunks, Al Sayeh parceled them out to various firms from around the world, largely drawn from her extensive personal network of friends and colleagues in Western Europe. Her architects responded with an almost alarming degree of formal fantasy and conceptual ambition, apparently spurred on by both the possibilities and the constraints of the particular locale and conditions.

"Because Bahrain is a place of such few resources, you have to be very inventive in

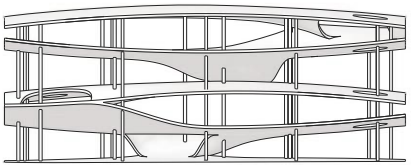


ELEVATION — PLOT A



ELEVATION — PLOT B

ELEVATION — PLOT C



ELEVATION — PLOT D

Parking Garages | Credits

ARCHITECT: Christian Kerez — Christian Kerez, principal; Caio Barboza, project architect; Dennis Saiello, Lisa Kusaka

ENGINEER OF RECORD: Arsinals Engineering Design

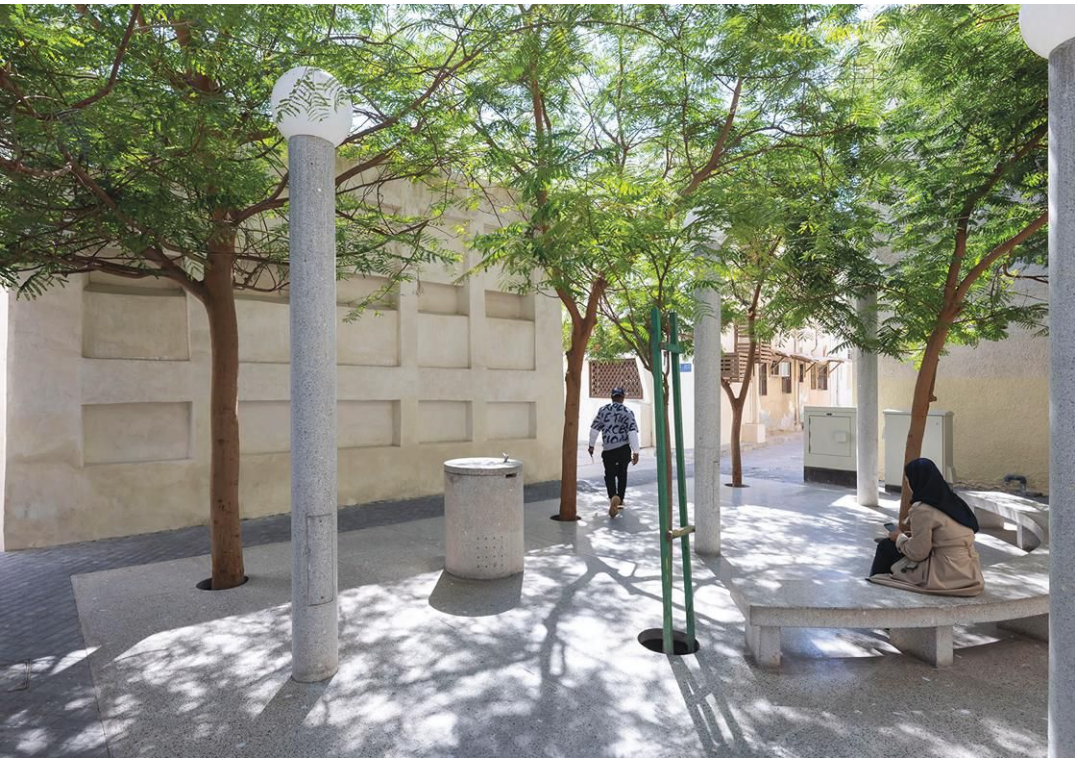
ENGINEERS: Ferrari Gartmann (Plot A); Neven Kostic (Plot B); Monotti Ingegneri Consulenti (Plots C and D)

CONSULTANTS: Baukolorit (concrete); Catherine Dumont d'Ayot (landscape, Plots C and D); LK Argus, Alden Studio (traffic); Siegrun Appelt with Mathias Burger (lighting)

terms of materials and structure," says Anne Holtrop, describing the overall process as "really tricky." The Dutch-born architect is speaking of his own multipart commission comprising a new portion of the Souq Al Qaysariya commercial facility, work on preexisting market structures nearby, and the renovation and exhibition design of the revitalized Siyadi Majlis Pearl Museum. Ranging from the quasi-Brutalist sophistication of the concrete-clad souk to the subdued, delicate feel of the museum, Holtrop's job was made all the trickier for having to be coordinated with the other project participants, in particular the participant in chief, Al Sayeh, who also happens to be Holtrop's wife and longtime business partner.

Other team members faced different challenges. "I didn't want to just export an architecture," says Swiss architect Christian Kerez. Tasked with creating the parking structures for the largely pedestrian-oriented redevelopment, the designer had to strike a compromise between the Middle East's growing dependence on cars and the historic fabric of Muharraq that the Pearling Path is meant to protect. As it happens, it was a problem Kerez was eager to take on. "Parking garages are a neglected typology," he says. "I thought it would be fascinating to do one." The first of the projects to be completed, a four-story complex with space for over a hundred vehicles, slips discreetly into its urban surrounds with exquisitely thin concrete slabs, each one with a slightly different improbable geometry from the next. Appearing to billow in the cool Gulf breeze, the effect is as sophisticated as any of Miami's high-design garages from recent years, yet created (as Kerez explains) using standard regional practices and formwork.

From Belgium, OFFICE KGDVS was brought aboard (along with landscape practice Bureau Bas Smets, a fellow Brussels firm) to assist in the creation of the Path's semiconnected sequence of public plazas, as well as the design of a footbridge passing over a busy automotive thoroughfare (produced in partnership with local firm Ismail Khonji Architects). "It was very important to create spaces that would not just reflect the pearling tradition, but that would also be used by the people living there," says OFFICE's Jelena Pancevac. Picking their way through the narrow streets, the team of KGDVS and Smets made a series of minute, strategic interventions, four of them realized to date, producing "green oases" of seating and plantings embedded in the warren-like cityscape. For the viaduct,



OFFICE KGDVS and Bureau Bas Smets partnered on public spaces (left) and a footbridge (above). Dar Al Jinaa is dressed in a fabriclike chain mail (opposite).

minimal impact was also key; the span is supported by simple concrete piers that rhyme with the coral-laden stone of the nearby buildings, forming the last piece of the maze between the waterfront and the city.

In such an immense labyrinth, there are bound to be a few confusing twists and turns—and not just in the physical sense. "It's a complicated project," Al Sayeh admits, "one that intersects a lot of other things." Besides the abovementioned studios, a whole caval-

Pearling Path and Footbridge | Credits

ARCHITECT: OFFICE KGDVS — Kersten Geers, David Van Severen, Federico Perugini, Anna Andrich, Nenad Đurić, Alexandra Paritzky, Denis Glauden, Paul Christian

ARCHITECT OF RECORD: Ismail Khonji Associates

LANDSCAPE ARCHITECT: Bureau Bas Smets

ENGINEERS: Gulf House Engineering, Transsolar

cade of additional firms—Valerio Olgiati for the Visitor's Center (RECORD, March 2019), Formafantasma for three installations in the restored houses, and a grab bag of engineers, restoration specialists, and consultants—have been involved in the Pearling Path, which also happens to sit adjacent to a number of projects (most notably OFFICE's striking Dar Al Jinaa events space) not technically part of the scheme. Still more designers may (or may not) be drawn into the project in the future, its scope remaining surprisingly hazy over a decade into its construction. And then there's the uncertain matter of why, save for a few Bahrani collaborators like Khonji, the majority of the architects have come from abroad, most of them from the same rarefied avant-garde stratum familiar to attendees of certain fairs, festivals, and -ennials of assorted denominations. It's a question that might be paired with the observation that, owing to Bahrain's small size, almost the entire workforce for the Pearling Path had to be imported, largely from South Asia.

But then these things are not exactly new. "This isn't just about tourism," says Al Sayeh. As its once-profitable oil sector continues to decline (a 6 percent drop in output every year since 1970), Bahrain has been attempting to revive its age-old pearling industry, establishing a reputation for both organic harvesting techniques and for expertise, with ultramodern analytical facilities and a rapidly burgeoning jewelry fair. Trumpeting the country's association with those gleaming balls of calcium, the Pearling Path and its high-flown, forward-looking new architecture is part of an attempt to reassert Bahrain's status as a center for the sale and production of luxury goods, putting it back on the map right where the Greeks, Romans, and Persians had it. If the project's background definitely feels more global than local, the same could be said for Bahrain. ■

Ian Volner is the author of numerous books and monographs and has contributed articles on architecture and design to The Wall Street Journal, The New York Times, *and* The New Yorker, *among other publications.*

Dar Al Jinaa Events Space | Credits

ARCHITECT: OFFICE KGDVS — Kersten Geers, David Van Severen, Santiago Giusto, Federico Perugini, Anna Andrich, Nenad Đurić, Paul Christian, Denis Glauden, Alexandra Paritzky

ENGINEERS: Emaar Engineering

SIZE: 6,450 square feet

COST: $850,000 (construction)

KAOHSIUNG PORT TERMINAL | TAIWAN | RUR ARCHITECTURE

Smooth Sailing

After a 13-year effort, architects Jesse Reiser and Nanako Umemoto complete a sinuous terminal for cruise ships in Kaohsiung Harbor.

BY THOMAS DANIELL
PHOTOGRAPHY BY IWAN BAAN

THE TERMINAL serves Kaohsiung Harbor, the busiest port in Taiwan (this image).

RESEMBLING a pod of porpoises frozen in midleap, the Kaohsiung Port Terminal gradually rises into view above a mundane skyline as one approaches from the southern Taiwanese city's downtown. At the waterfront—a patchwork of parking lots and construction sites, shipping containers and cranes—it's difficult to tell whether the building is emerging from the sea or from the land. Passing the light-rail stop at street level, one ascends to the automobile drop-off at the main entrance, set on a raised platform that extends almost to the site's perimeter. Only here does it become clear that the architecture is not a set of discrete overlapping and intertwining objects, like a school of fish or a den of snakes, but rather a single multilimbed (or multiheaded?) creature, its asymmetrical tentacles and snouts all sprouting from the arrival lobby.

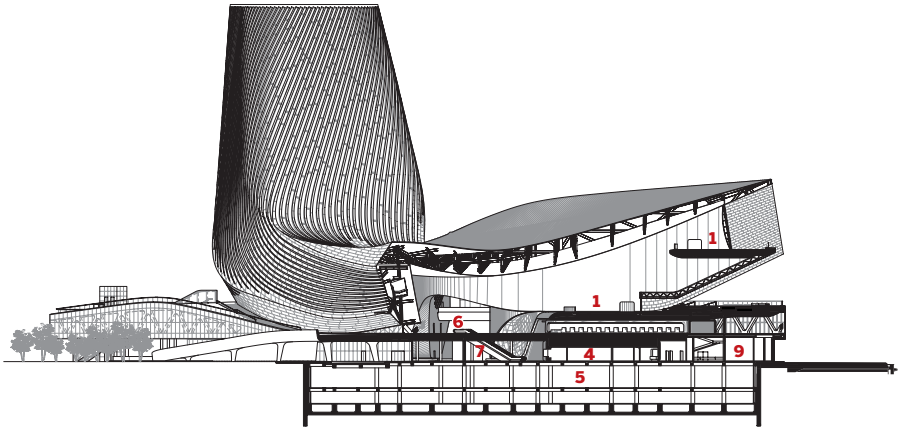
This international cruise ship terminal is the second major project in Taiwan by RUR Architecture, the New York–based practice of husband-and-wife team Jesse Reiser and Nanako Umemoto. Incorporating a tower containing administrative offices for Taiwan's busiest port, the terminal is described as "three-dimensional urbanism" by its architects, who hope this initial node will guide and connect future development along the waterfront. Wrapping around the exterior, the entry platform doubles as a boardwalk with an expansive view of the harbor, as well as a broad canopy for informal street markets. Various elbows and groins contain gardens in arrays of dots and stripes. From certain angles, it all feels somewhat predatory and surreal. Are these vermiform extrusions looming overhead to be understood as blind, snuffling trunks in search of airborne prey? Or, more benignly, a consequence of tropism, the botanical phenomenon that causes plants to twist or grow toward sunlight, nutrients, and moisture?

While this talk of biology may sound overwrought, it is in many ways relevant—not only to the terminal but also to the architects' design process more generally. An extraordinary achievement in terms of form, space, structure, and material, the building is an efflorescence of ideas and techniques explored by Reiser and Umemoto over the course of their careers. They admit that the interest in zoomorphism partly originates in their exposure, as students at the Cooper Union in New York, to the figural experiments of longtime dean John Hejduk, in which Reiser detected "a feeling of empathy between building and people, much like the Japanese belief in the latent animism of things that charges objects

GILL-LIKE openings in the cladding (above) bring light into the terminal, which includes an integrated office tower (left). Rearing cantilevers cover entrances (opposite).

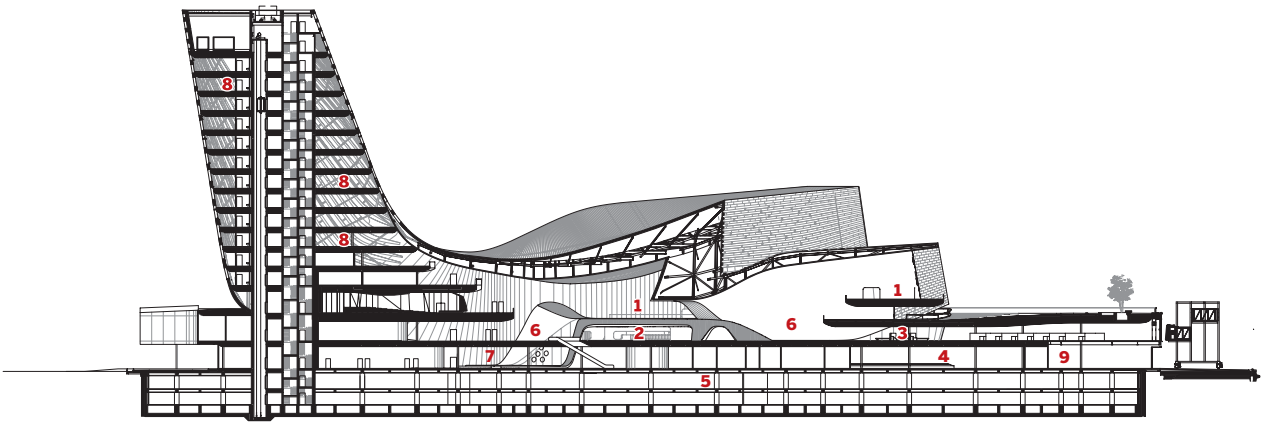
with a certain vitality." But the direct precursors in their own work are the trilobed schemes for the Cardiff Bay Opera House competition in 1994 and the Taipei Music Center (RECORD, January 2022). At Kaohsiung, the directionality is reversed; rather than three auditoriums oriented toward a shared stage, as in Cardiff, or three buildings organized around a plaza, as in Taipei, here the spaces expand outward and upward from the central lobby.

With fully transparent ends oriented toward the sky, and partly glazed throats allowing views down to the esplanade and the water beyond, the rearing cantilevers are a combination of steel trusses and spaceframes—effectively enormous box girders that more or less smoothly merge with the canted office tower and its diagrid exoskeleton. The aluminum envelope, with gill-like slats and scalelike panels, at first appears to be a thin skin. In



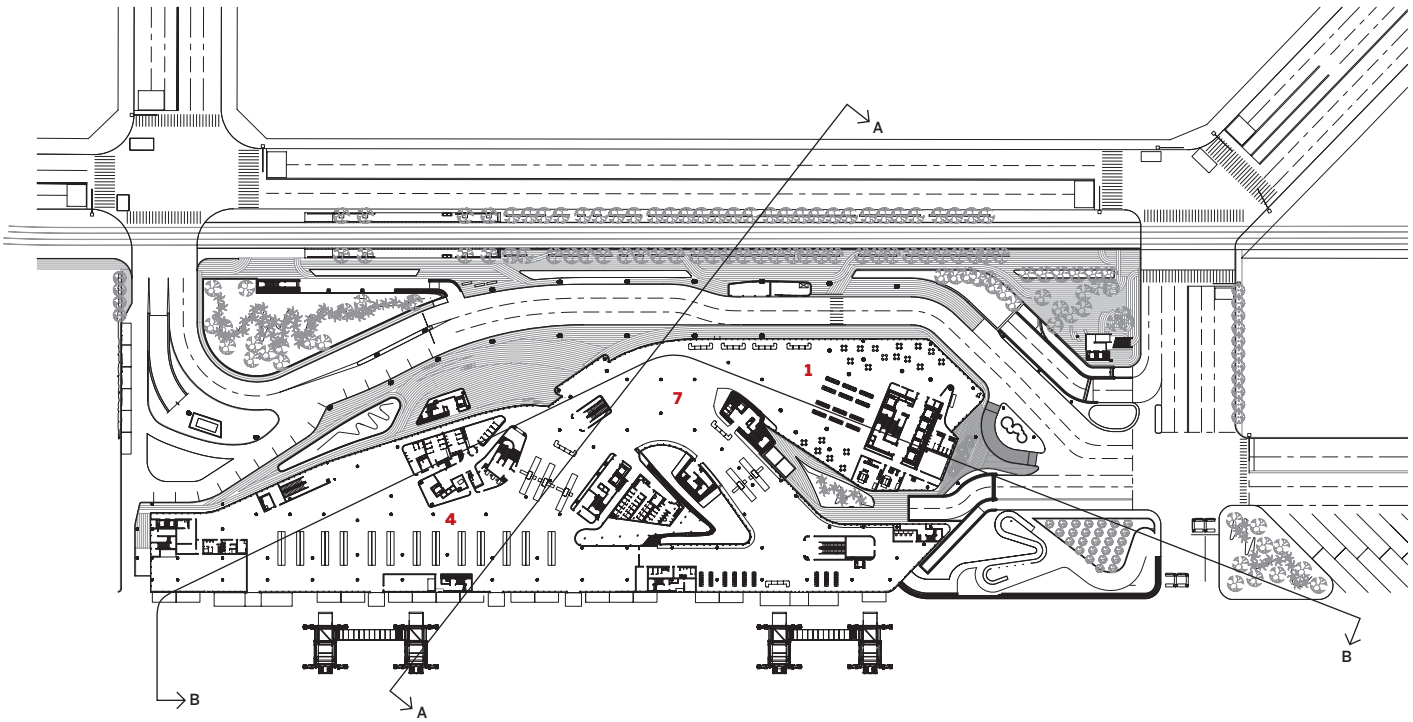
1 CAFÉ
2 SHOP
3 SECURITY
4 BAGGAGE CLAIM
5 PARKING
6 DEPARTURES
7 ARRIVALS
8 OFFICE
9 MECHANICAL

SECTION A - A



SECTION B - B

0 60 FT. 20 M.



LEVEL-ONE PLAN

0 100 FT. 30 M.

SMOOTH surfaces line interiors (above and right).

fact, it has a varying thickness that conceals not only structural and mechanical elements, but a network of secondary public corridors. This intricate spatial manifold is, according to the architects, inspired by the engines of Ferrari's Formula One cars, but again reflects Hejduk's influence—specifically his pedagogical exercise of transforming a musical instrument into a building. The terminal recalls the combination of functional and aesthetic precision that produces both the elegance of a clarinet and the awkwardness of a set of bagpipes. Such biomechanical analogies might suggest that the terminal was parametrically designed, using calculus-based, continuously varying forms. Actually, the sinuous profiles are concatenations of elliptical segments connected at tangent points, painstakingly crafted through hand drawings and models, then later finessed with software.

Not everything has gone according to plan, of course. The legal requirements of privacy, security, and fire safety for an international transport facility have necessitated physical and visual barriers—ranging from guide ropes and glazed

partitions to solid bulkheads—in places where the architects had hoped for continuity. In some cases, these have been grudgingly integrated with the body of the architecture; in others, they were installed retroactively. Navigating the cavernous interior might be a confusing experience for tired tourists expecting a clearly demarcated sequence of ticketing, immigration, customs, and boarding areas, but it is never difficult and, above all, never dull.

Though the building was unshaken by the April earthquake in Taiwan's Hualien County, 125 miles to the northeast, when leaving by sea or by land, one might catch a glimpse of movement in the rearview mirror. The parallax effect seen from a turning or receding vehicle causes a slow, majestic shifting of the silhouette of the Kaohsiung Port Terminal as it seems to come to life. ■

Thomas Daniell is a professor of architecture at Kyoto University in Japan.

ENTRY AND EXIT ramps for automobiles echo the curvilinear nature of the terminal's many limbs (above).

Credits

ARCHITECT: RUR Architecture — Jesse Reiser, Nanako Umemoto, principals; Jasmine Lee, Neil Cook, Michael Overby, Kris Hedges, Eleftheria Xanthouli, Juan DeMarco, Massimiliano Orzi, design team; Toshiki Hirano, Sonya Chao, Imaeda Ryosuke, assistants

ARCHITECT OF RECORD: Fei & Cheng Associates

ENGINEERS: Ysrael A. Seinuk, Supertek (structural); Arup, I.S. Leng, Mininger (m/e/p)

CONSULTANTS: Arup (port planning and logistics); Environmental Arts Design (landscape); Meinhardt Facade Technology (facade); Izumi Okayasu Lighting Design Office, Fomolux (lighting)

GENERAL CONTRACTOR: Chun Yuan Construction

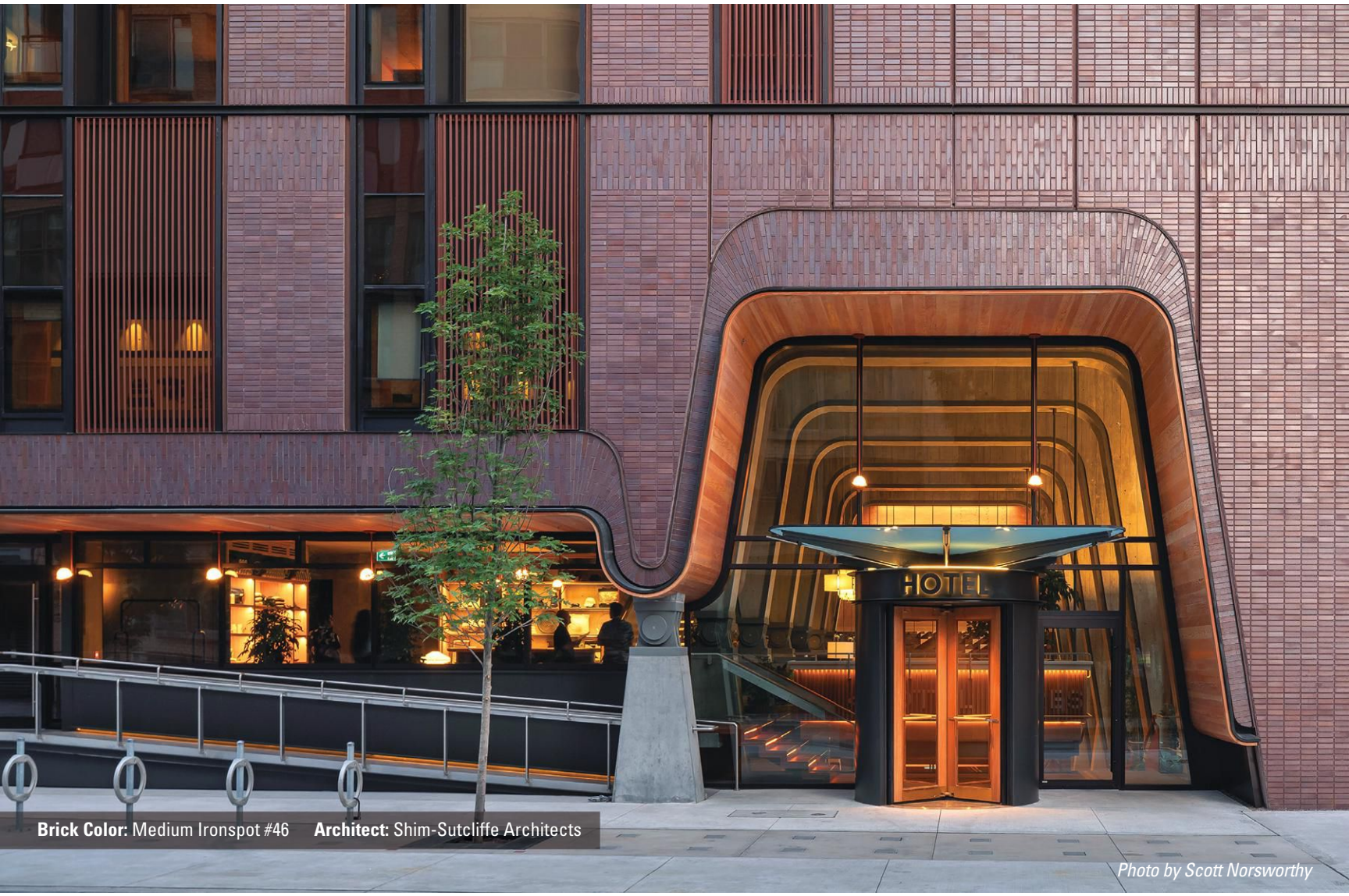
CLIENT: Kaohsiung Harbor Bureau

SIZE: 397,000 square feet

COST: $165 million (construction)

COMPLETION DATE: March 2023

ACE HOTEL TORONTO
ONTARIO, CANADA



Brick Color: Medium Ironspot #46 **Architect:** Shim-Sutcliffe Architects

Photo by Scott Norsworthy

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More than a trend, the benefits of biophilic design remain much sought after in the world of architecture. While up to this point much of the biophilic design elements have focused on options like improved daylighting or exposed wood and natural stone, biophilia also includes the human element, specifically art. Lessons learned post-pandemic have put the occupant's well-being, especially mental and emotional health, front and center when designing interior surfaces. Increasingly new projects and major renovations focus on how to transform traditional offices, health care facilities, schools, and retail spaces into a catalyst for a positive human experience.

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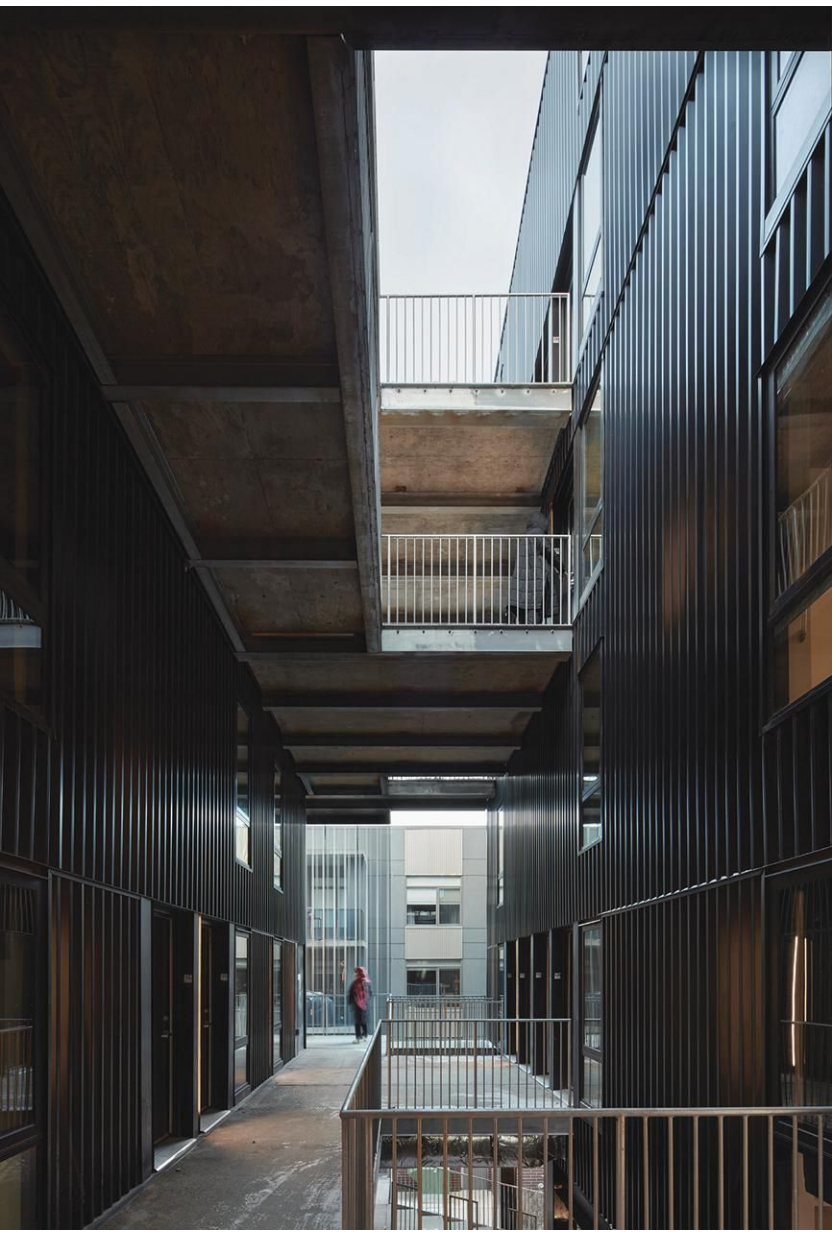
PUMPHOUSE | WINNIPEG, MANITOBA | 5468796 ARCHITECTURE

Pump and Circumstance

A pair of steel-clad apartment buildings adjoins an adapted historic waterworks.

BY PANSY SCHULMAN
PHOTOGRAPHY BY JAMES BRITTAIN



AT THE TURN of the 20th century, Winnipeg was Canada's boomtown. Already a longtime trading post, courtesy of its prime location at the fork of the Assiniboine and Red rivers, the opening of the Canadian Pacific Railway in 1881 made the city a leader in international grain markets and the agricultural center of the country, garnering it the nickname the "Chicago of the North." During this era, the Exchange District, a 20-block area nestled in the curve of the Red River, emerged as the budding metropolis's commercial and cultural core, home to the city's prominent financial institutions, businesses, and nightlife. Though Winnipeg's industrial prominence has faded over the course of a century, reminders of this golden age are visible in the Exchange's cobblestone streets, narrow alleyways, and bevy of architectural treasures, including terra-cotta-clad Chicago-style skyscrapers and stately stone-and-brick warehouses.

One less-glamorous remnant is a single-story pumping station, a squat brick building occupying a 4,500-square-foot site in a prime location near the riverfront. Originally built in 1906 to aid in fighting the frequent fires that afflicted the district, the original building served its civic duty for decades—distributing water from the river to over 70 fire hydrants in the downtown area. In 1986, however, the dated facility was shuttered by the city.

After years of limbo, a technically ambitious design by 2011 Design Vanguard 5468796 Architecture, completed earlier this year, allowed the pumping house to step up for the city once again, procuring a new role in a new century. Taking an economically and environmentally frugal approach to preservation, the Winnipeg-based firm integrated an office and restaurant within the existing building and flanked it with two five-story housing blocks.

Founded in 2007 by Johanna Hurme and Sasa Radulovic, 5468796 has a wide swath of Winnipeg housing projects under its belt and is known for tackling complex commissions on tricky sites. Called Pumphouse, this project represents a culmination of the many lessons learned by the firm over years of practice, from grappling with the historic district's complex building codes to juggling financial constraints and varied programmatic needs. "We pulled out every tool in our kit to make this project feasible," says Hurme. "To us, that means maximizing the quality of life for the inhabitants while creating a vital player in the cityscape."

Elevated 30 feet above street level on concrete plinths and steel stilts, the project's timber-framed residential components are clad in jet-black corrugated metal, offering a severe contrast to the beige solidity of the heritage building sandwiched between them. However, the firm's

IMAGE: COURTESY 5468796 ARCHITECTURE

THE JET-BLACK steel facades and structural elements of Pumphouse's residential buildings (above and opposite) reference the industrial structure's preserved interior (right).

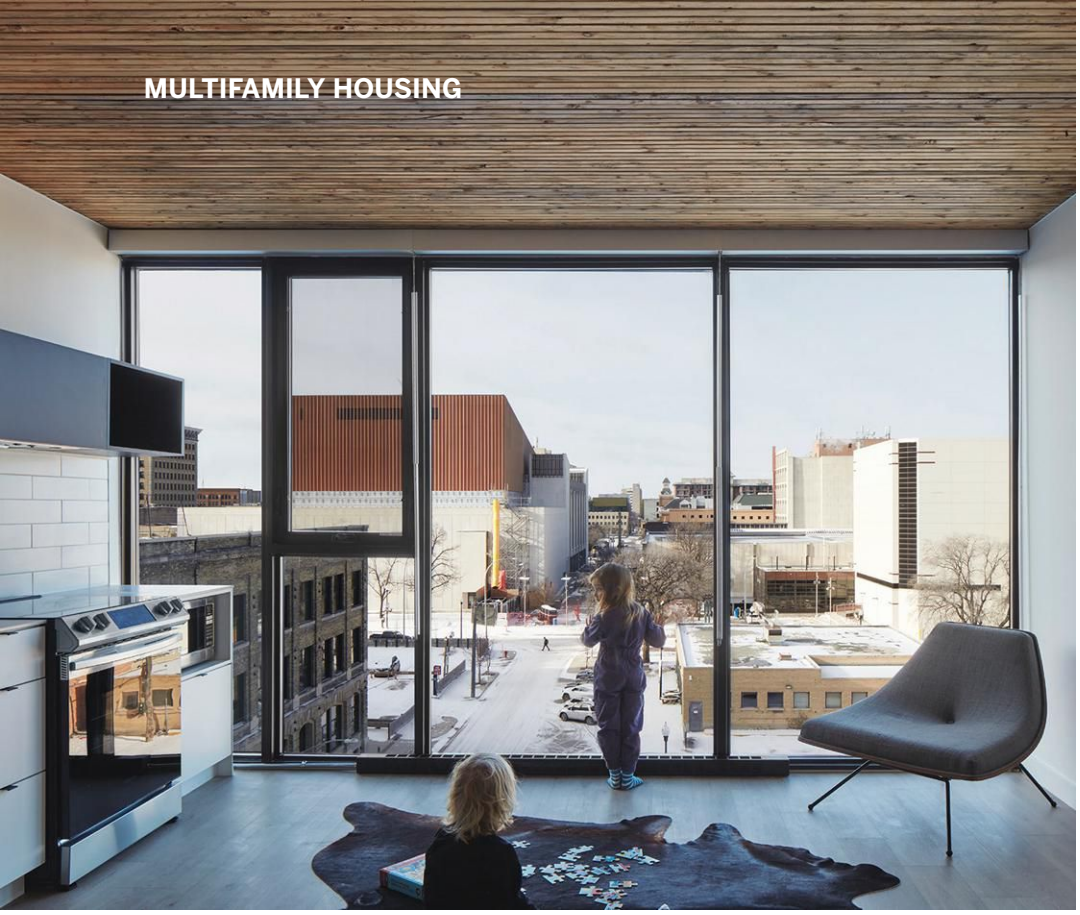
thoughtful material choices and intricate spatial solutions reflect and extend the central preservation project's guiding principles.

The 28-unit building to the east is slotted into a narrow, formerly vacant parcel of land alongside Waterfront Drive, a bustling thoroughfare where well-stocked trains once trundled on now-demolished railroad tracks. The western end of the site hosts two adjacent buildings, connected by a shared corridor, and containing a total of 63 residential units, with a commercial space (currently occupied by a hair salon) and public amphitheater nestled below.

The design concept turned a typical North American housing block inside out, emphasizing and externalizing circulatory corridors. This typology is particularly unusual in Winnipeg, which endures long subzero winters and high winds, but was central to the project's public-facing philosophy. "Having grown up in European multifamily housing, Johanna and I understand that community happens in these shared spaces," says Radulovic. "Placing the circulation on the outside of the building fosters connections among the people in the building and back to the city itself."

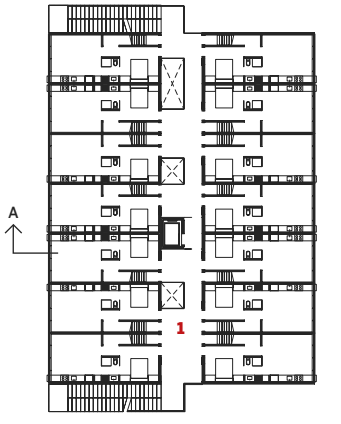
The cantilevered open-air stairways are protected with a fine-grain metal mesh and are accessible via pedestrian bridges that lead from the restored pumping house's interior, wrapping around the building's volumes, and into shared corridors on the second, fourth, and sixth levels. This "skip-stop" arrangement was made possible by alternating two- and one-story residential units and cut the building's total area by 10 percent.

All the apartments are, appropriately, railroad style, but the exterior corridors enable windows within the centrally placed bedrooms, allowing cross ventilation and an abundance of natural light. Each suite is capped with full-height glazing at either end,

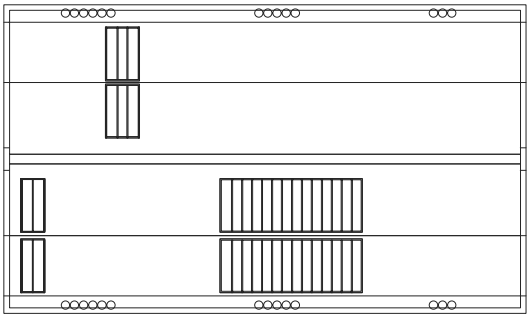


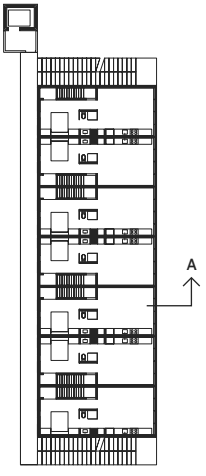
which frames panoramic views of the city or riverfront. Taking advantage of a building technology as old as the Exchange itself, unit floors and ceilings are made up of unvarnished nail-laminated-timber slabs, lending a touch of visual warmth to the otherwise chromatically austere project. The stairways and corridors use raw and unfinished materials—galvanized zinc, concrete, and aluminum—both visually and physically connecting the new volumes to the pumping house. "Every part of this project is stripped down to its absolute essence," says 5468796 associate Ken Borton, the project's design architect.

Since its shuttering almost 40 years ago, more than a dozen attempts have been made to revive the original building. But its heritage status, bestowed in 1982, presented a major development hurdle, mandating the preservation of the pumping machinery, exterior brick walls, windows, concrete foundation, and timber roof. Proposals swirled and floundered around the structure until 2015, when Radulovic and Hurme heard from a friend in local



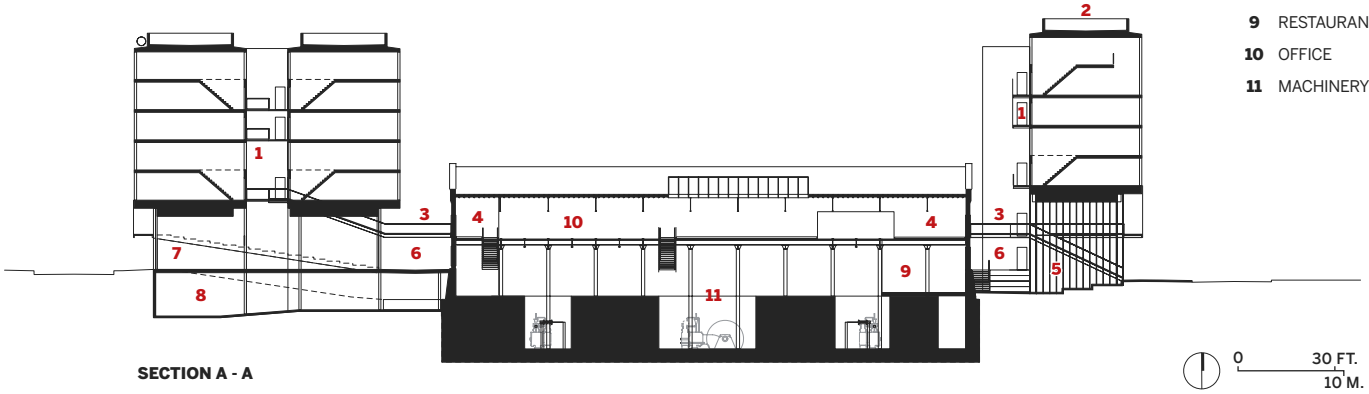
LEVELS 2, 4 AND 5 PLAN





LEVELS 3 AND 6 PLAN

1 EXTERIOR CORRIDOR
2 ROOFTOP TERRACE
3 ELEVATED WALKWAY
4 RESIDENTIAL ENTRANCE
5 COVERED PLAZA
6 PEDESTRIAN LANE
7 COMMERCIAL SPACE
8 UNDERGROUND PARKING
9 RESTAURANT
10 OFFICE
11 MACHINERY FLOOR



SECTION A - A

government that the city was moving toward demolishing the structure.

With no brief or commission, the firm took the project on "as a personal challenge," says Radulovic, first devising a financially and technically viable multipurpose program for the development, and then convincing an existing client—Alston Properties—to build it. Hurme used the term "critical opportunism" to describe the firm's go-getter approach: "We like to create work for ourselves," she said with a laugh.

Allocating only $2 million of the project's $22 million total budget to its adaptive-reuse phase, the firm treated the pumping house as a "found object," leaving as much of the original structure as untouched as possible. "The history is part and parcel of the building's narrative," says Radulovic. "That includes the dust, rust, and patina."

The long and narrow pumping house is divided into two gabled bays, each equipped with a 20,000-pound gantry crane running the 150-foot length of the interior. The most glaring design challenge was that its original floor was 18 feet below grade, but the design team realized they could leverage the existing crane system to suspend a "floating floor" over the engine room's guts, creating a flexible and airy office space (currently leased to a software company). By incorporating full-height glazing into the floor plate's new interior envelope, this economical design strategy not only preserved the building's equipment but put it on full display, allowing workers, visitors, and passing apartment residents to peer down into the vast expanse of machinery below. For a more intimate view, the interior walls of the ground-floor restaurant on the building's east end are also enclosed with glass.

Though visually distinct and spatially separated from the no-frills restoration endeavor they adjoin, Pumphouse's sleek housing blocks expand the spatial language of the 118-year-old building's refreshed interior, with the exposed structural elements that lift the building off the ground acting as an extension of the gantry crane structure inside. The web of circulatory corridors stretches the grid of the historic building's new floor plan outside its original walls, spilling into the residential spaces and even, by creating new public spaces below, onto the surrounding streetscape. The firm's endeavor simultaneously obscures and illuminates the line that divides public from private and old from new, integrating the project's spaces fully within the multiple contexts of its program and rapidly developing neighborhood. ■

OPEN-AIR walkways connect new construction to the historic pumping house (this image). Units feature floor-to-ceiling glazing (opposite).

Credits

ARCHITECT: 5468796 Architecture

ENGINEERS: Lavergne Draward & Associates (structural); MCW Consultants (mechanical, electrical, civil)

CONSULTANTS: Scatliff + Miller + Murray (landscape); Crosier Kilgour (energy); GHL Consultants (code)

GENERAL CONTRACTOR: Brenton Construction

CLIENT/OWNER: Alston Properties

SIZE: 18,000 square feet (office and hospitality); 76,500 square feet (multifamily residential)

COST: $22 million

COMPLETION DATE: January 2024

Sources

STRUCTURAL SYSTEM: Holz Constructors (nail-laminated-timber floors & prefabricated wood stud walls); Phoenix Iron Works (structural steel); U.S. Aluminum (curtain wall)

EXTERIOR CLADDING: Vicwest (corrugated steel); KlarTech (aluminum)

GLAZING: Duxton Windows and Doors (interior glass); Polygal (skylights)

DOORS: U.S. Aluminum (entrances); Penner Doors & Hardware (metal doors)

26 POINT 2 APARTMENTS | LONG BEACH, CALIFORNIA | MICHAEL MALTZAN ARCHITECTURE

Long Beach Marathon

Polychromatic supportive housing offers residents a humble reminder of life's journey.

BY SARAH AMELAR
PHOTOGRAPHY BY IWAN BAAN

THE LENGTH of a marathon is 26.2 miles, and a new building in Long Beach, California, providing affordable housing to a formerly homeless population, was named "26 Point 2" to acknowledge the old adage that life is a journey, sometimes with daunting obstacles.

In designing the 49,500-square-foot structure—housing 76 studio apartments, a manager's unit, and supportive social services—Michael Maltzan Architecture (MMA) recognized the strong need for community, both among the residents and within the broader surroundings. "Even though homeless people live out in the public realm, right on the streets," observes principal Michael Maltzan, "it can be a profoundly isolating experience." Addressing that reality, the architects developed a building that not only integrates multiple natural gathering spaces, but also mediates between two very different neighborhood conditions.

Located on a corner, the five-story structure extends from the Pacific Coast Highway (PCH), a busy commercial strip along the site's northern edge, to a residential area with modest dwellings, tucked

THE ROOFLINE playfully steps down to meet the scale of nearby houses (this image). This silhouette is also visible from the inner court (opposite).

SECTION A - A

0 10 FT. 3 M.

SECOND-LEVEL PLAN

0 20 FT. 6 M.

1 COURT
2 LOUNGE
3 OPEN-AIR CORRIDOR
4 STUDIO
5 MANAGER'S UNIT
6 TRASH ROOM
7 ELECTRICAL
8 ENTRY

behind the thoroughfare. The massing, with a stair tower anchoring the corner, is composed primarily of crisp-edged volumes (some interlocking) clad in stucco and raised on columns over a communal ground level. The long, east-facing entry facade, along a quiet side street, steps down from PCH toward the clustered homes—bridging the shift in scale and character—as 26 Point 2's jagged roofline descends from a butterfly (or V-shaped) silhouette to lower peaks. Such angled elements, punctuating the building's orthogonal lines, nod to the nearby gabled houses and the many pitched motifs along the boulevard.

Flashes of color, playing against the otherwise white elevations, enhance the reading of discrete (yet interconnected) parts—most vividly where planes of Kelly green offset the stair tower, or where pale blue returns subtly accentuate the depth of the punched apartment windows. Marking 26 Point 2's entrance is a flat-faced triangular pediment forming a canopy—the gable end of a stripped-down, double-pitched roof that hovers over gathering spaces at grade. That simple prismatic form and the separately articulated block of apartments above it appear almost skewered together by the supporting columns.

"We wanted a design-forward building—

FLASHES OF pale blue, in the court (above) and stairwells (above, left), and green, in the covered patio (left), play against otherwise white walls.

one that wouldn't hide itself, but would complement the neighborhood and stand with pride in the community," says Peter Enzminger, development director of Long Beach–based Excelerate Housing Group, the affordable-housing developer that commissioned 26 Point 2 as its inaugural project. MMA was chosen for its considerable experience designing and building innovative supportive housing elsewhere in Los Angeles County. Excelerate funded the $28 million project through low-income-housing tax credits from the city and county, along with private-sector sources.

"But along the way, this project threw us all some real curveballs," says Enzminger. One of the most consequential was the discovery of abandoned oil wells on-site, which had to remain outdoors for future access. So the original ground-floor plan required a key modification, splitting a large community room into a somewhat smaller indoor space and an open-air patio. "That turned out to be a positive change in the evolution of the design," says Enzminger, "because it added to the indoor-outdoor California feel." The remaining 990-square-foot room (which includes an open kitchen and tables) has a glass curtain wall facade, heightening the sense of spaciousness and connection to the boulevard. To accommodate another site obstacle, the north facade is slightly skewed, not quite parallel to PCH, allowing the structure to skirt the boundary of an earthquake fault zone.

The robust columns that lift the building's main volume above the ground level, provide for continual spatial flow—from lobby to breezeway mailbox area and community room beyond. "We tend to take mailboxes for granted," says Maltzan, "but they're very meaningful here—affirming for residents that they actually have an address of their own." Similarly combining the practical with the social, the windowed laundry space, set strategically adjacent to the community room, offers yet another venue for casual interaction.

The architects gave the building a courtyard, or rectilinear-donut, configuration—simultaneously addressing needs for communal connection and on-site parking. With its 15 spots primarily serving the daytime staff (as most formerly homeless people don't own cars), this central area doubles as an open-air plaza, with supportive-service offices along one side. Exterior balconies, with entrances to individual apartments, overlook the court.

UNITS (top) open onto exterior balconies that surround the courtyard (left). The building anchors a corner site near a highway (opposite).

(There's also a fourth-floor roof deck with views out toward the neighborhood.) Relying on a mix of single-loaded corridors and open-ended, double-loaded ones, this LEED Gold–certified structure bypasses the need for hallway temperature control in Long Beach's mild climate.

With deft economy of means, color performs throughout the building's inner reaches essentially, as Maltzan puts it, "as a material," enhancing experiential and atmospheric qualities. As in chromatic light sculpture, daylight and calibrated tones alter readings of depth, shadow, and space. A luminous pale blue (matching the window returns), for example, not only animates the courtyard elevations but also lines the walls and ceilings of some corridors, producing an immersive ethereal effect. Enzminger describes it as "an intentionally soothing shade," projecting an aura of calmness that gently draws you in. Elsewhere, reflected hues cast expressive gradations of what Maltzan calls "borrowed color" onto the white stucco.

26 Point 2 opened in December 2023 and is now 100 percent occupied. Recently, when a woman, entering the building with bundles in hand, caught this journalist staring at the facade, she glanced up and said, "Yes, it really is a very special place." ■

Credits

ARCHITECT: Michael Maltzan Architecture — Michael Maltzan, design principal; Tim Williams, managing principal; Ben Ruswick, project manager; Yun Yun, project architect; Khoa Vu, Sharon Xu, team

ENGINEERS: KPFF Engineering (civil); Labib Funk and Associates (structural); Donald F. Dickerson Associates (m/p); Salas O'Brien (electrical)

CONSULTANTS: Tina Chee Landscape Studio (landscape); AWC West (specifications); D7 Consulting (waterproofing); Simpson Gumpertz & Heger (code, fire, life safety); Partner Energy (sustainability)

GENERAL CONTRACTOR: Benchmark Contractors

CLIENT: Excelerate Housing Group

SIZE: 49,500 square feet

COST: $28 million (construction)

COMPLETION DATE: December 2023

Sources

EXTERIOR: Arcadia (curtain wall); LaHabra (stucco)

ROOFING: Carlisle (TPO); Kemper System; Westcoat (deck coating)

WINDOWS: VPI Quality Windows

GLAZING: Vitro Architectural Glass

DOORS: Arcadia, DKS Doors, Haley Architectural Doors

HARDWARE: Schlage, Falcon, Ives

INTERIOR FINISHES: Dunn Edwards Paints (paints); Formica (plastic laminate); Arizona Tile (solid surfacing); Daltile (tile); Tarkett (resilient flooring)

LIGHTING: Deco, DMF, Oracle

HEARTWOOD | SEATTLE | ATELIERJONES

The Missing Middle

A new code for tall mass-timber buildings sets the stage for workforce housing in a tech boomtown.

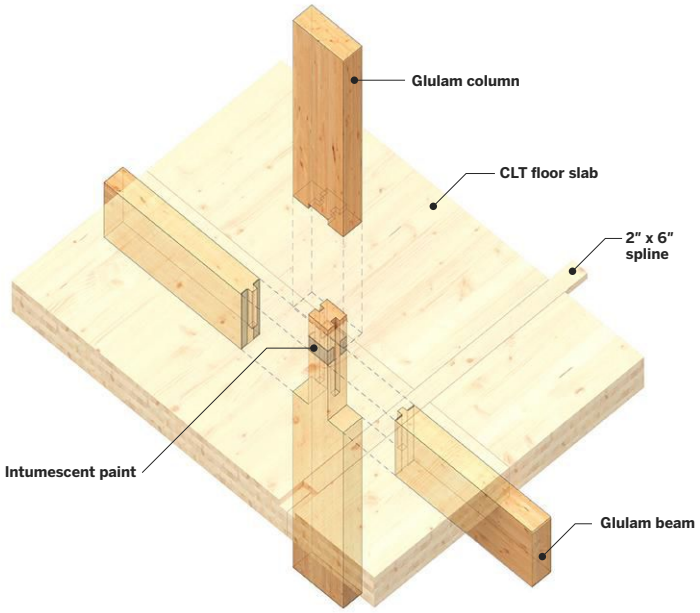
BY JOANN GONCHAR, FAIA
PHOTOGRAPHY BY LARA SWIMMER

POST-PANDEMIC layoffs notwithstanding, Seattle remains a prime hub for tech employment. A recent study by commercial real-estate services firm CBRE found that the city was the top destination for recent tech grads, and second, behind Austin, across all experience levels. Seattle ranks overall as one of the country's top 10 metros for tech jobs, and the sector accounts for a whopping 30 percent of the region's economy, according to research by CompTIA, a trade association. At the same time, there is a pressing housing shortage. According to the county's estimates, Seattle will need more than 100,000 new houses, condos, and apartments over the next 20 years. The dominance of tech exacerbates this housing crunch, since the industry's well-paid workers strain the limited supply. The shortage is experienced most acutely by the city's poorest, but also by its middle-income residents, many of whom can no longer afford to live near where they work.

One project responding to this urgent need is Heartwood, an eight-story, 67,000-square-foot apartment building completed earlier this year on the site of a former parking lot in the city's Capitol Hill neighborhood. Designed by Seattle-based atelierjones, and owned by local nonprofit-housing operator Community Roots Housing, Heartwood offers 126 units (113 studios and 13 one-bedrooms), of which roughly one-third are income-restricted. With monthly rents for the unrestricted units starting below $1,400, the apartments are aimed at those earning between 60 to 100 percent of the area median income—the so-called "missing middle," who earn too much to qualify for traditional affordable-housing programs but still struggle to find apartments within their means.

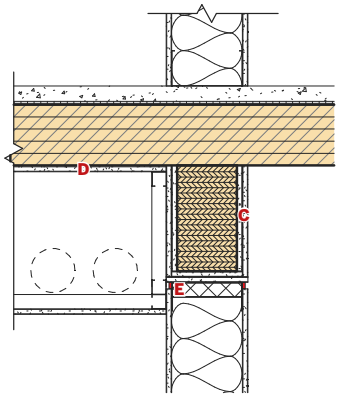
In addition to accommodating an underserved market, Heartwood is notable for its novel structural system. It has a mass-timber frame that is, in large part, exposed on the interior, conforming to the requirements for what is known as Type IV-C construction under the recently adopted tall-wood provisions of the 2021 version of the International Building Code (IBC)—the model code used by most jurisdictions in the U.S. According to Susan Jones, atelierjones's founder, Heartwood is the first in the nation to take advantage of the new IV-C classification, which pertains to buildings up to eight stories and 85 feet tall. The new standards also include a

ON A CORNER lot on Capitol Hill, the mass-timber-framed Heartwood provides 113 studios and 13 one-bedroom apartments.

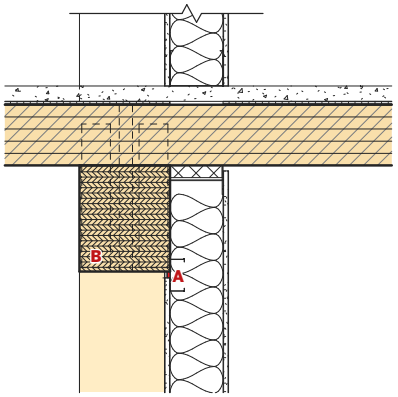


MORTISE-AND-TENON JOINT

PERSPECTIVE DIAGRAM



ENCLOSED SOFFIT DETAIL



TOP OF WALL/EXPOSED BEAM DETAIL

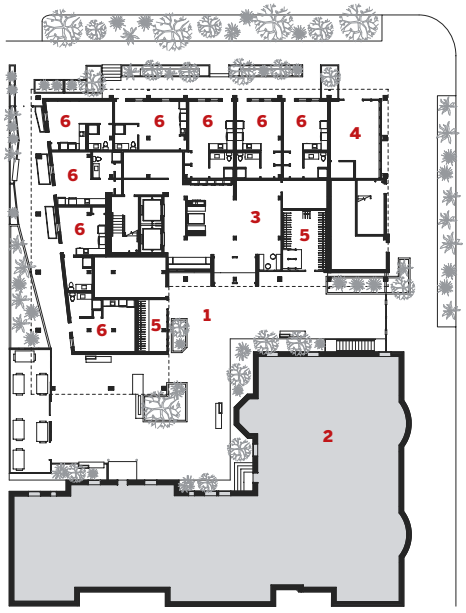
A DEFLECTION JOINT BLOCKING WITH REGLET REVEAL AND INTUMESCENT TAPE

B BEAM-TO-COLUMN FIREPROOFING AT CONNECTION FACES

C GYPSUM WALLBOARD WRAP

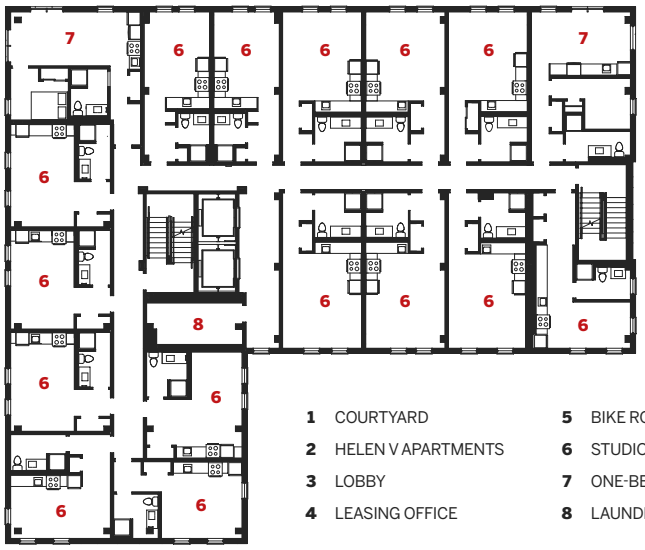
D ONE LAYER OF GYPSUM WALLBOARD AT UNDERSIDE OF CLT DECK

E DEFLECTION TRACK AT TOP OF WALL WITH COMPRESSIBLE MINERAL WOOL AND INTUMESCENT TAPE



SITE PLAN

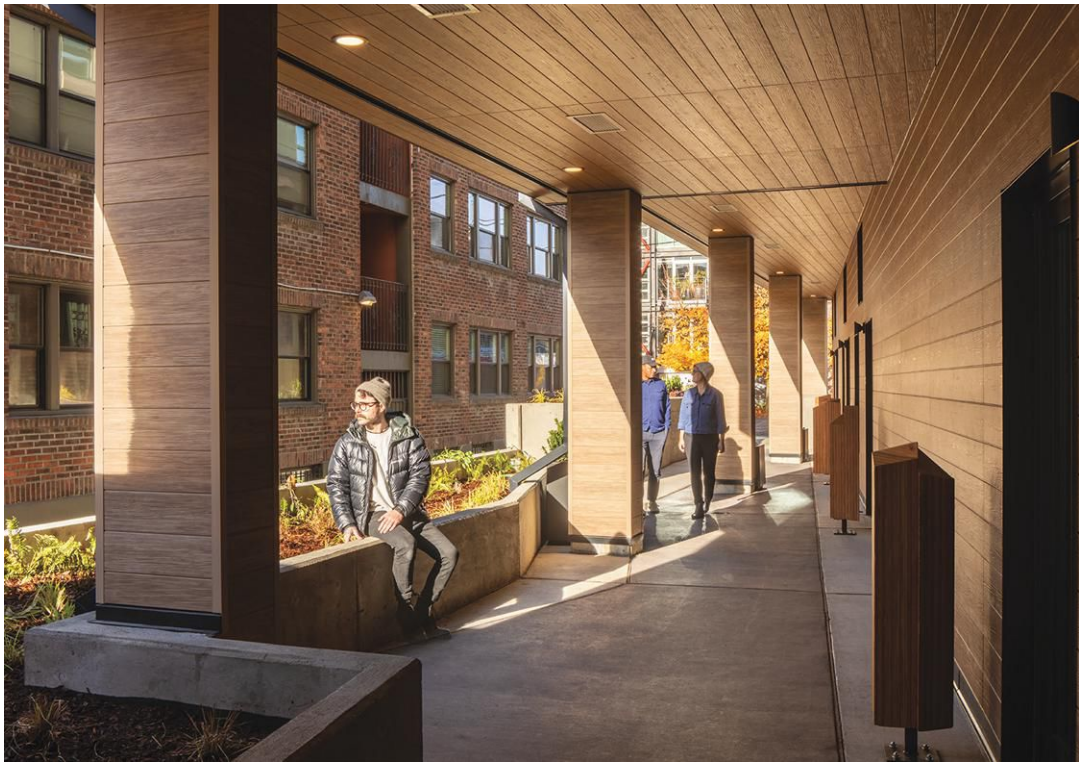
0 50 FT.
15 M.



1 COURTYARD
2 HELEN V APARTMENTS
3 LOBBY
4 LEASING OFFICE
5 BIKE ROOM
6 STUDIO
7 ONE-BEDROOM
8 LAUNDRY

TYPICAL-FLOOR PLAN

0 15 FT.
5 M.

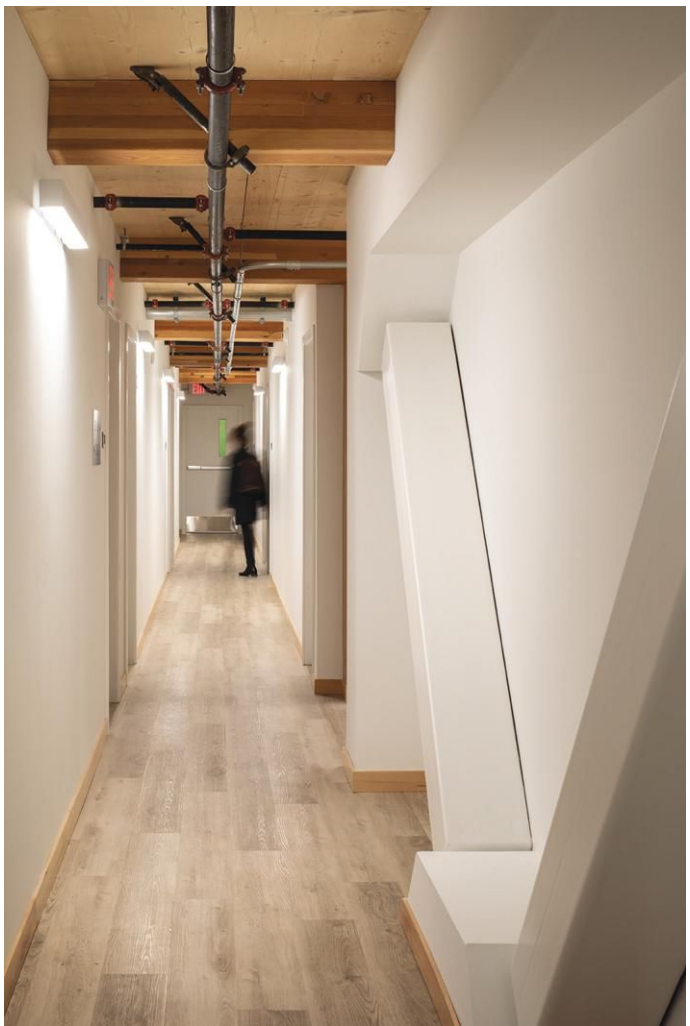


HEARTWOOD shares a courtyard with an existing apartment building owned by the client (above). First-floor apartments are accessed directly from the exterior (right).

Type IV-B for buildings up to 12 stories and a Type IV-A for those up to 18 stories. With each increase in height, the code mandates greater levels of fire protection requiring, for instance, that more of the timber be encapsulated in noncombustible materials.

It is not surprising that Jones would opt for mass timber for Heartwood's structural system. Since founding her practice in 2003, she has developed a deep expertise in the material, using it on projects that include her own house, a church, and prototype housing for residents of Greenville, California, who lost their homes in the 2021 Dixie Fire (RECORD, June 2023). She has long advocated for mass timber's mainstream adoption, serving on the International Code Council committee that developed the IBC's tall-wood requirements. Her interest in the material is primarily environmental—a means for mitigating construction's carbon footprint.

Mass timber, however, was a less obvious



THE TIMBER is largely exposed throughout the building, in spaces that include the lobby, the apartments (opposite), and the corridors (left), where the seismic bracing at the cores is also visible.

choice for Community Roots Housing, which did not set out to build with the material or even work with atelierjones. As Jones recounts, in 2019 her firm had been awarded a $250,000 Wood Innovations Grant from the U.S. Forest Service to investigate the feasibility of Type IV-C construction—but for an office project, rather than a residential one, with another client. At the 11th hour, however, site control of the project fell through. To take advantage of the funds, Jones needed a new project. After reaching out to dozens of developers—through friend and colleague A-P Hurd, founder of real-estate consultancy, SkipStone Development—she connected with Community Roots, which was working with SkipStone to build workforce housing. The nonprofit agreed to partner with atelierjones. “It was one of the most joyous yeses I have ever received,” says the architect.

People who walk by Heartwood, at the corner of East Union and 14th streets, will probably have no idea that there is something unusual going on beneath its understated fiber-cement-panel rainscreen skin. But on close inspection, one can detect a level of attention that is atypical in a mid-market multifamily project. For instance, the punched windows (all high-performance and triple-glazed) are slightly recessed and jog back and forth across the facade to create a subtle play of shadow and a syncopated rhythm. The first-floor apartments, entered directly from the exterior, are set back, creating almost the feel of townhouses. And if those passersby venture down 14th Street, they can catch a glimpse of an intimate courtyard—complete with barbecue area—shared with an existing three-story affordable apartment building owned and managed by the same client.

Behind Heartwood's modest exterior is its mass-timber superstructure, whose wood elements were all sourced from within the surrounding Cascadia region: glulam columns and beams, five-ply cross-laminated timber (CLT) floor slabs, and mass plywood panel stairs enclosed, for seismic resistance, within steel buckling-restrained-brace-frame (BRBF) cores. The L-shaped assembly sits on top of a straightforward concrete slab and grade-beam foundation.

Working with a new code meant that atelierjones had to establish interpretations of its requirements, especially relating to fire protection. It developed details for the building's myriad conditions, including where interior partitions or enclosed soffits meet exposed timber. The most elegant of these details is an all-wood mortise-and-tenon joint connecting columns and beams developed in collaboration with the structural consultant DCI Engineers and the company Timberlab, which performed virtual design coordination for Heartwood, as well as mass-timber fabrication and erection. The detail includes intumescent tape applied to the surfaces within the joint. If exposed to heat, the tape will expand, filling gaps and preventing fire infiltration. According to Timberlab, the absence of bolts, hangers, or other fasteners helped speed erection. On average, the beams for each level were installed in half a day, versus two to three days for steel connections.

The design and construction strategy yields compact apartments, averaging 400 square feet, with standard features, including drywall partitions, plastic-laminate cabinets, and vinyl flooring. But the timber frame and CLT ceilings provide warmth and natural appeal.

Beyond the biophilic benefits, Heartwood demonstrates a way of building with the potential for a significantly smaller environmental footprint compared with more conventional materials. According to a life-cycle analysis conducted by the University of Washington, the global-warming potential of Heartwood's superstructure is 38 percent lower than a concrete building of the same size. If the carbon stored in the timber is included, the result is a 108 percent reduction, making Heartwood's superstructure carbon negative.

The project is readily replicable and scalable; atelierjones has even assembled a booklet that shows how Heartwood's guiding principles could be adapted to buildings of different sizes, heights, or site conditions. If the project proves popular with tenants, we could see hundreds of similar mass-timber structures around the country, helping tackle two of today's most pressing problems—the earth's warming and the housing shortage. ■

Credits

ARCHITECT: atelierjones—Susan Jones, principal architect; Ian Maples, job captain; Olga Amigud, Lenore Wan, Bron Heinz, Alex Zink, Eleanor Lewis, Meghan Doring, project team

CONSULTANTS: HV Engineering (m/p); Bergelectric (electrical); DCI Engineers (structural, civil); Blueline Group (landscape); Greenbusch Group (acoustical); Wiss, Jenny, Elstner Associates (envelope, fire protection); WoodWorks (mass timber)

GENERAL CONTRACTOR: Swinerton

CLIENT: Community Roots Housing

SIZE: 67,000 square feet

COST: withheld

COMPLETION DATE: February 2024

Sources

FACADE PANELS: James Hardie, Nichiha

MASS TIMBER: Timberlab (virtual design coordination, fabrication, erection)

GLULAM: DR Johnson Lumber

CLT: Kalesnikoff

MASS PLYWOOD: Freres Engineered Wood

LATERAL SYSTEM: Superior Steel

WINDOWS: Eco Windows

SUSPENSION GRID: 9Wood

ENTRANCES: Kawneer

MOISTURE BARRIER: VaproShield

INSULATION: Rockwool

ELEVATORS: Kone

WINDOWS are predominantly courtyard-facing (above). The historic facade was rebuilt with brick chosen to match the old (right).

PHOTOGRAPHY: © ALEXANDER SEVERIN (LEFT); BRETT BEYER (RIGHT)

15 ALLEN STREET | BUFFALO | ADAM SOKOL ARCHITECTURE PRACTICE

Flip Side

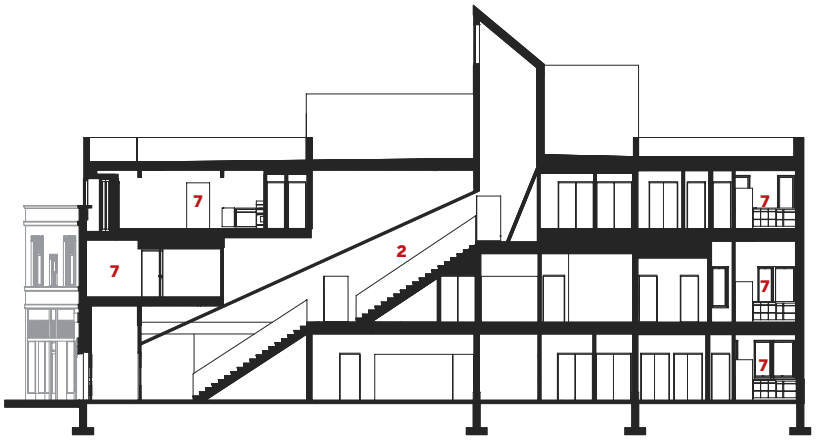
A young firm delivers mixed-use infill with the help of Buffalo's revamped zoning.

BY MATTHEW MARANI

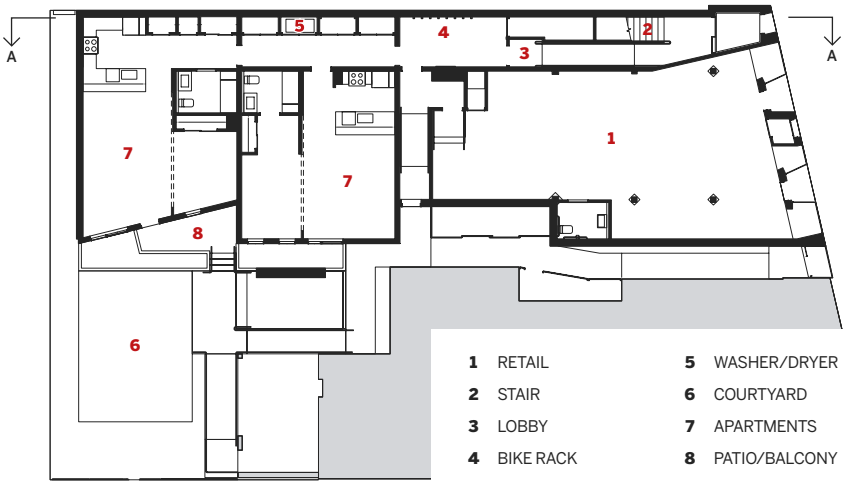
BUFFALO has had a rough go of it for the last 70-odd years. The Rust Belt city on the banks of Lake Erie has suffered decades of deindustrialization and demographic decline, losing some 55 percent of its population since 1950. In recent years, the city, with the help of fast-growing eds-and-meds industries and refugee resettlement, has seen a measured, but vital, revival of its fortunes; 15 Allen Street is a product of that upswing. The three-and-a-half-floor mixed-use infill building designed by Los Angeles–based Adam Sokol Architecture Practice (ASAP) is deftly inserted into the city's Allentown neighborhood with contextual massing and straightforward, well-detailed materials.

The eclectic Allentown Historic District is located just west of Buffalo's Main Street and runs along the de facto border of the city's formerly redlined eastern half. In 2017, the Buffalo Common Council passed the Green Code, the first major revision of the city's land-use and zoning policies since 1953. The bill effectively ratified what had previously been noncompliant, the mixed uses that organically emerged in Buffalo's historic neighborhoods, and eliminated minimum parking requirements to enable infill development.

In 2015, developer May Wang purchased 15 Allen Street, a dilapidated two-story retail building constructed in the 1920s, hoping to capitalize on the prime location steps from the city's light rail system and the Buffalo Niagara Medical Campus. "It was absolutely trashed,



SECTION A - A



FIRST-LEVEL PLAN

SECOND-LEVEL PLAN

with rotting wood, and past the point of complete conservation," explains Adam Sokol, whose firm was a 2019 Design Vanguard. The site could only accommodate six residential units under existing zoning laws, a financially prohibitive proposition, considering the cost of restoration, even with the associated tax credits. However, the project was made viable by the subsequent passage of the Green Code, and the State Historic Preservation Office and National Park Service signing off on the partial demolition of the historic building, with just the brick and cast-stone facade incorporated into the new structure. It received approval from the city in 2017, one of the first projects in Buffalo to do so under the new code.

The building's roughly rectangular footprint covers approximately 90 percent of its lot. The 10 rental units consist of 650-square-foot one-bedrooms, with one two-bedroom apartment and two loft-style duplexes. Residents share a courtyard and bicycle storage with adjacent 19 Allen Street, a mixed-use project also owned by Wang—it formerly housed ASAP's studio before the firm decamped to the West Coast in 2018.

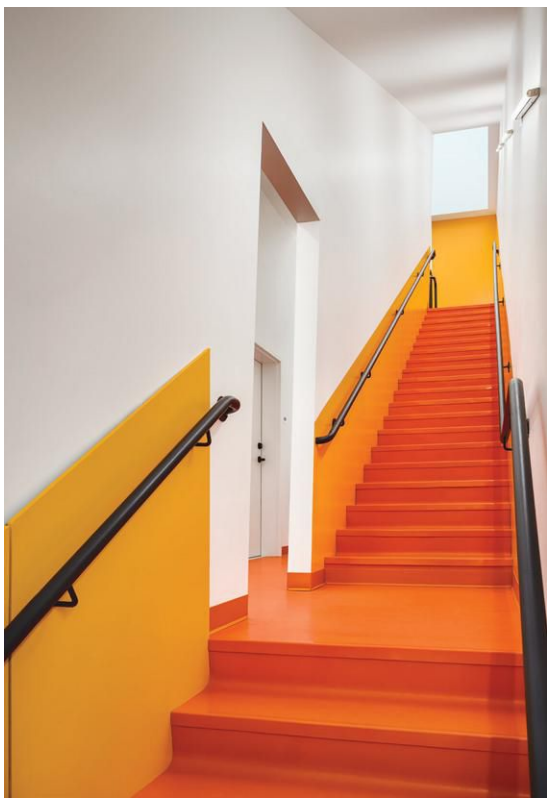
Three contrasting faces mark the project's exterior. The historic facade was almost entirely rebuilt with new brick chosen to match the old. Parts of the existing cast-stone trim were taken down, cleaned, and reinstalled. In accordance with the city's fire code, the east elevation is a concrete-masonry-block party wall shared with a privately owned and undeveloped parcel. That left the courtyard-facing and rear elevations as the primary avenues for architectural expression. There, the dark-gray steel-clad massing staggers upward and folds onto itself as the building steps back from the street wall, in a move that affords six private patio and balcony spaces across all floors.

The multifaceted character of the building exterior is echoed in section. The new structure, with primarily 10- and 12-foot-tall ceilings in the apartments, needed 15-foot-tall ceilings for the 1,400-square-foot retail space, which occupies just under half the ground floor. That expansive ceiling, supported by glulam posts and beams—the rest of the building is standard light-frame wood construction—took up valuable room for the residential units, so ASAP turned elsewhere to maximize leasable space. The building's two ADA-compliant apartments are located on the ground floor, so there was no need for an elevator, and the design team was permitted to include just one point of egress for the apartments above—an orange-splashed stairwell. The second levels of the two loft units are classified as mezzanines, to fit in a half floor, and the skylight for the stairwell, which reaches nearly 60 feet tall, skirts height limits by taking advantage of a decorative-tower zoning allowance.

Apartment finishes are kept simple. Features like the light-colored hardwood flooring and white cabinetry and solid-surface countertops contrast with the building's dark exterior. With the party wall to the east, and the retail storefront to the south, the west elevation, facing the courtyard, is the main source of daylight, with generous high-performance casement windows.

Notably, 15 Allen Street is one of the first all-electric buildings in Buffalo, with ultra-efficient heat pumps and solar water heaters, all of which help keep energy use and costs down. But, without all of the bells and whistles, it may just be 15 Allen Street's location that provides the greenest credentials. "The most important aspect of the project's sustainability is that it is an infill building, with no vehicular parking, that's far bigger than almost anything else you could do," Sokol concludes. ■

THE apartment finishes are light and simple (above). A single point of egress saved valuable square footage (right). Glulam columns and beams support the retail space (far right).



Credits

ARCHITECT: Adam Sokol Architecture Practice

ENGINEERS: Siracuse Engineers (structural); Foit Albert Associates (civil)

CONSULTANT: Joy Kuebler Landscape Architects (landscape)

GENERAL CONTRACTOR: Peyton Barlow Company

CLIENT: May Wang/Mayflower Allen Property

SIZE: 12,000 square feet

COST: $4 million

COMPLETION DATE: May 2022

Sources

EXTERIOR CLADDING: Watsontown Brick (brick); ATAS (metal panels); A. Jandris & Sons (architectural concrete masonry)

ROOFING: Holcim Elevate (elastomeric)

WINDOWS AND DOORS: Kolbe (wood frame and entrances)

HARDWARE: Emtek (locksets); Zweil (pulls); Sugastune (hinges)

INTERIOR FINISHES: Sherwin-Williams (paints and stains); Daltile (floor and wall tile); Roppe (resilient flooring)

LIGHTING: Kuzco, Nora (downlights)

PHOTOGRAPHY: © BRETT BEYER (2); ALEXANDER SEVERIN (BOTTOM, LEFT)

SAN MATEO COUNTY NAVIGATION CENTER | REDWOOD CITY, CALIFORNIA | OFFICE OF CHARLES F. BLOSZIES

Building Blocks

A factory-assembled modular system aims to quickly shelter those transitioning out of homelessness.

BY CLARE JACOBSON
PHOTOGRAPHY BY MATTHEW MILLMAN

The San Mateo County Navigation Center (SMCNC)—supportive interim housing for formerly unhoused people "navigating" their way to permanent quarters—was built for speed. The Office of Charles F. Bloszies coordinated the facility's design-build delivery and developed its prefabricated modular construction system, as well as oversaw a team of government, community service, and design professionals, to complete the 2.5-acre, 53,800-square-foot, 240-unit center in California's Silicon Valley in less than a year.

Covid-19 necessitated this speed. "When the pandemic hit, the number of homeless people in San Mateo was increasing, but the number of shelter beds stayed flat," says Joe Stockwell, former board chair of nonprofit LifeMoves, which manages SMCNC. San Mateo County's interim housing model of many beds in a single shared room was no longer permissible, and a county-owned bayside site in an industrial area offered a clean slate to develop private accommodations. The plan developed with prefabricated 10-by-40-foot modules containing two housing types—simple sleeping units, with four separate bedrooms, connected into single- and two-story buildings; and units with two separate bedrooms and en suite baths stacked into three-story structures—that acknowledge the differing needs of residents. "They are designed as permanent, code-compliant structures," says Charles Bloszies, who was both architect and structural engineer of SMCNC, "but in theory could be taken apart and reassembled on another site." Additional modules contain toilets, support spaces, and food-service facilities. The strategy's savings in time and construction brought the cost to $237,500 a door—less than half that of conventional construction, according to Bloszies.

Yet SMCNC does not feel as if it was rushed. Much of this has to do with the site planning, which makes the center look less like an emergency shelter than a well-established campus. The plan is organized around what Bloszies refers to as a piazza. "A central orienting feature is very important to the residents," he says, "because they are coming from a rather chaotic environment." Four fingerlike bars of housing spread from this place in an arrangement that both allows light into the units

SLEEPING units are accessed via stairs (this image) and exposed walkways (opposite).

SITE PLAN

1	SLEEPING UNITS WITH BATHS	**5**	STAFF OFFICES	**9**	LAUNDRY
2	SLEEPING UNITS	**6**	DINING HALL	**10**	BATHROOMS
3	SECURITY	**7**	COMMUNITY CENTER		
4	MEDICAL SERVICES	**8**	RESIDENT SERVICES		

MODULES with bedrooms (opposite, bottom left) are stacked into bars (opposite, top). Larger buildings accommodate amenities (opposite, bottom right).

and creates interstitial green spaces. The central area, with a basketball court, is designed to be lively, while those on the sides are meant to be quieter, offering residents places that match their personalities.

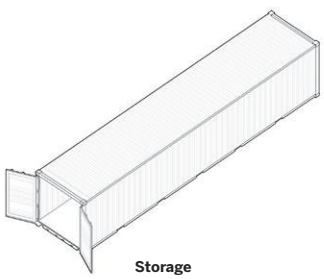
Another key to the success of SMCNC is the quality of its materials, which were chosen not only for their durability and ease of maintenance but also for their hominess. These include wood stairs and corridors, large corner windows, thoughtfully placed built-in shelving, porcelain-clad steel toilets, and fiber cement exterior panels in numerous textures. The predominant color is gray, in a variety of tones. "The idea here is to have a calm palette," Bloszies adds.

Two large buildings—a community room and a dining hall with commercial-grade kitchen, each with a garage-door opening to the outdoors—were constructed on-site while the modular units were being fabricated. Then the modules were trucked in and craned into position. "All the plumbing projects outward," says Bloszies, "so that, when one box is placed atop another, everything connects." The amenities include case-management and counseling spaces and medical and dental clinics—services that previous LifeMoves centers contracted off-site. "With a

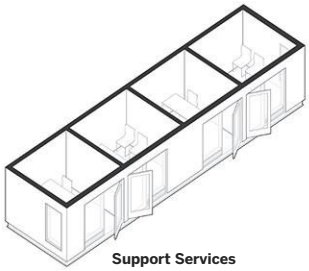
Sleeping Unit with Bath

Sleeping Unit

Toliets and Showers

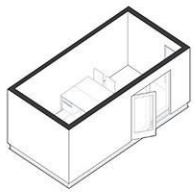


Storage



Support Services

Food Service



Support Services

Toilets

PHOTOGRAPHY: © MATTHEW MILLMAN + JONATHAN MITCHELL (RIGHT)

ELEVATOR towers serve as wayfinding landmarks.

clean slate, we could design and construct something that not only gives people dignity and privacy," Stockwell says, "but do it in such a way that brings our residents into a social milieu where everything's available for them."

Bloszies had done work for the San Francisco Department of Homelessness and Supportive Housing before moving into modular design—a move motivated, in part, by the pandemic's demand for social distancing. SMCNC is the second of four Bay Area navigation centers he has designed, and each new project has evolved from its predecessors. First his team completed a 102-door center in Mountain View in eight months. SMCNC added bathrooms to the sleeping units. A third project in Palo Alto, currently under construction, includes family units, while another in San Jose will add private kitchens. Bloszies has plans for his modular prototypes to extend beyond the Bay Area to other communities in need. "We set this up to be what we're calling open-source design," he says, eager to share his knowledge and drawings with other architects. "So if you want to build one of these, call us up." ■

Clare Jacobson is a San Francisco–based design writer and editor.

Credits

ARCHITECT: Office of Charles F. Bloszies — Charles Bloszies, principal in charge; Michael Bullman, Mark Warren, project managers; My-Linh Pham, Aidan Atman, designers

CONSULTANTS: BKF Engineers (civil); Meyers+ Engineers (m/e/p concept, telecom, energy modeling); EcoFire Sprinklers (fp); Rosendin Electric (design-build electrical); Air Systems (design-build m/p); CMG Landscape Architecture (landscape); Oneworkplace (ffe)

GENERAL CONTRACTOR: XL Construction

CLIENT: San Mateo County Project Development Unit

SIZE: 53,800 square feet

COST: $54 million (construction)

COMPLETION DATE: May 2023

Sources

MODULES: Silver Creek Modular

CLADDING: Ceraclad (rainscreen); GE Elemax (moisture barrier)

ROOFING: Carlisle, Johns Manville, Holcim Elevate

GLAZING: Vitro Architectural Glass

DOORS: Arcadia, Assa Abloy, Pacific Architectural Wood Products, American Building Supply, Cornell, Amarr

WINDOWS: Pella, Arcadia

INTERIOR FINISHES: Sherwin-Williams

LIGHTING: Gotham, Lithonia, Acuity

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Record Houses 2024

The editors of Architectural Record are now accepting entries for RECORD HOUSES. This annual issue showcases residential design that upends expectation, pushes disciplinary limits, and redefines established vocabularies in imaginative ways.

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DEADLINE EXTENDED: MAY 17, 2024

For submission details, visit architecturalrecord.com/call4entries

E-mail any questions to ARCallForEntries@bnpmedia.com. Include "Record Houses" in the subject line.

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PHOTOGRAPHY: © FRANK OUDEMAN

Role Models

Three housing developments achieve lofty social and environmental goals on tight budgets.

BY KATHARINE LOGAN

IT SOMETIMES seems as though the affordable-housing sector—which is presumably watching every dollar to scrimp or scrounge—regularly achieves standards of energy performance and livability that much of the market-driven sector barely aspires to.

The square footage of Passive House–certified multifamily development, for example, has more than tripled in the last five years, with affordable housing accounting for over 90 percent of the sector, according to Phius, a Passive House training, advocacy, and certification nonprofit. Similarly, the number of affordable-housing projects registered with one of the certification programs administered by the International Living Future Institute (ILFI) has more than doubled in the same period, with even more projects piloting the Living Building Challenge Affordable Housing Framework. Nearly 80 percent of multifamily projects that certified as GreenPoint Rated between 2020 and 2024 are affordable, with a dramatic upswing in the percent achieving the Gold or Platinum level.

BETANCES RESIDENCE, in the Bronx, New York, restores the urban streetwall at the front facade (above), but has a courtyard at the rear (top).

SOCIAL spaces at Betances look out onto the courtyard (left) as does the lobby (above), where light from a generous window calls attention to the texture of its corbelled brick wall.

Under LEED, 438 affordable-housing developments, representing 6,521 units, achieved certification in 2023 alone.

What's driving the sector's sustainability and livability achievements, how do ambitious goals fit into tight budgets, and are there lessons for fostering more environmentally and socially responsible multifamily housing nationwide? RECORD put these questions to Phius, ILFI, and the design teams behind three outstanding affordable-housing projects: Betances Residence, a Passive House–certified senior residence in the Bronx, New York, by COOKFOX Architects; Coliseum Place, a Living Building Challenge Affordable Housing Pilot and GreenPoint Rated Platinum building in Oakland by David Baker Architects (DBA); and 981 Davie Street, a Passive House–aspiring tower in Vancouver, British Columbia, by ZGF Architects.

The ambitions of all three projects, and similar achievements sector-wide, can be largely explained by three primary factors. The first is developers' social mission: "It's not only about housing—it's about quality housing," says Darin Reynolds, a partner with COOKFOX. And, even though housing is the core mission, adds Katie Ackerly, a principal and sustainable-design director at DBA, "that purpose often aligns with making the world a better place in multiple ways." The health impacts of the built environment are especially significant in the affordable sector, "more so than for market-rate buildings," says Susan Puri, affordable-housing director at ILFI, referring to data that correlate low-income communities with poor air quality and other environmental hazards, "because for a long time the built environment has perpetuated social inequities."

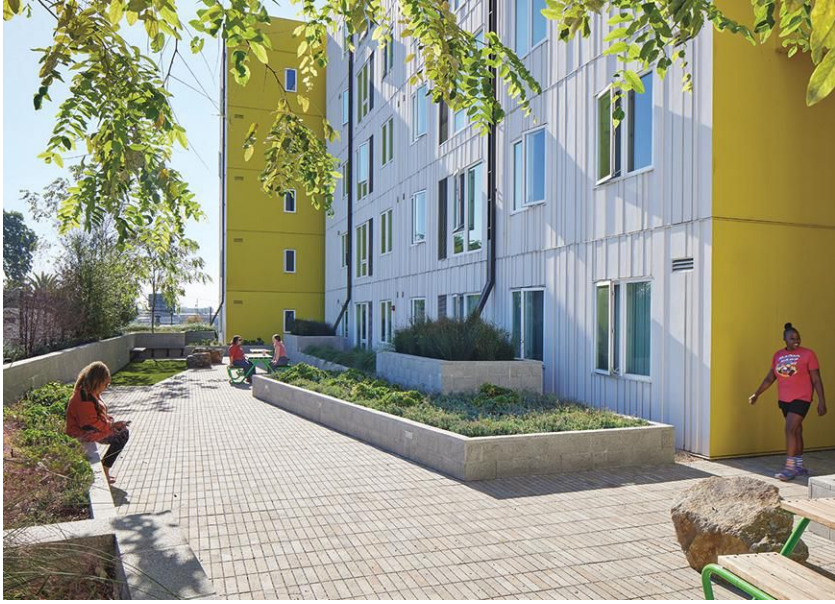
The second factor is social policy, especially when it's expressed through funding criteria and incentives. For example, federal low-income-housing tax-credit programs (LIHTC), which provide a significant portion of many affordable developments' budgets, are distributed through competitive programs (known as qualified allocation plans, or QAPs) run by state housing-finance agencies. A growing number of QAPs award points for environmental responsibility. In fact, Phius largely attributes the surge in the sector's uptake of Passive House to incentives in the QAPs of more than 17 states.

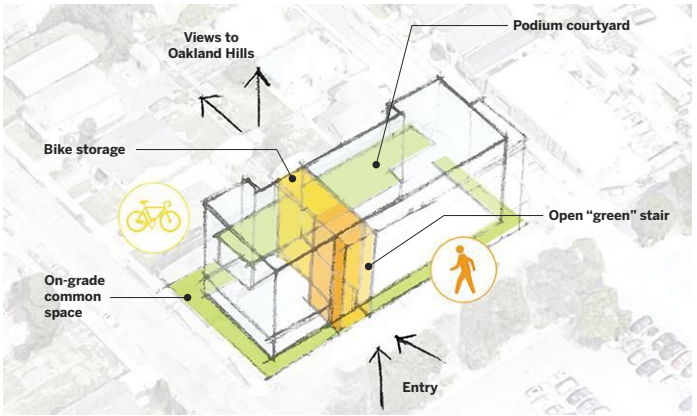
The third factor linking affordable housing and building performance is long-term ownership, which aligns both with social housing developers' mission and with common funding requirements. LIHTC-funded projects, for example, are required to preserve their affordability for 30 years. With a long-term view, reduced operating costs can more than reimburse up-front premiums, if any, associated with developing a high-performance building (as long as funders' caps on per-unit costs don't get in the way).

These three factors—client mission, funding-backed policy, and long-term ownership—pushed the performance goals of each of the three example projects. The specifics of the achievements and the strategies for realizing them on limited budgets vary with the circumstances unique to each project.

For Betances Residence, requirements to provide below-market housing for seniors, to certify under Enterprise Green Communities (a point-based environmental standard for affordable housing), and to achieve exemplary energy performance came as conditions of funding. Built on two formerly empty lots, one owned by the New York City Housing Authority and the other by New York City Housing Preservation and Development, the

PHOTOGRAPHY: © FRANK OUDEMAN





COLISEUM PLACE AXONOMETRIC DIAGRAM

COLISEUM PLACE in Oakland, California, has a landscaped podium (top, right) and is wrapped in a shade screen (top, left). Rooftop photovoltaics meet the energy needs of common areas, such as the lobby (right).

IMAGES: © BRUCE DAMONTE (TOP, LEFT AND RIGHT; BOTTOM, RIGHT); COURTESY DBA (BOTTOM, LEFT)

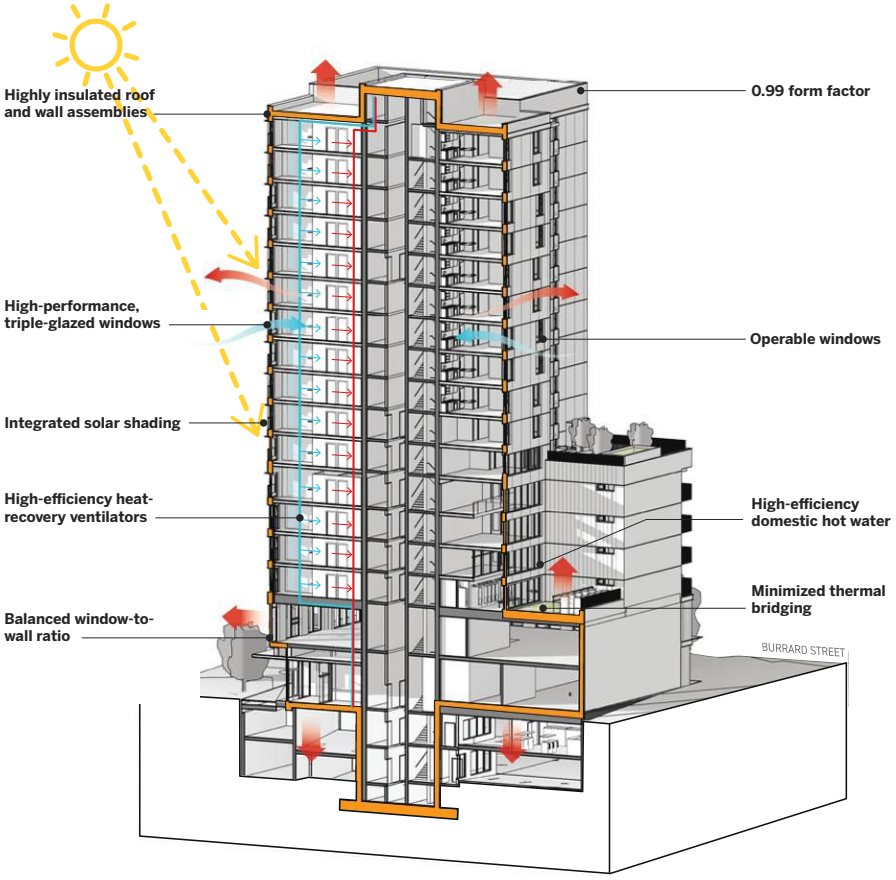
Passive House–certified Betances provides 152 units of supportive housing for at-risk seniors and achieves a 69 percent reduction in energy-use intensity (EUI) compared to a baseline building (17.4 kBtu/sf/yr versus 56). The eight-story structure, completed in 2022, was built for $560 per square foot and $440,000 per unit. The developer, Breaking Ground, says the budget is in line with comparable affordable multifamily projects where requirements for paying the local prevailing wage apply, and Reynolds says it's significantly lower than a market-rate development.

To get the most bang for the buck, Betances is designed to maximize floor area within a tight zoning envelope. Much of the ground floor is recessed more than 50 percent below grade, a move that gains almost an entire story of usable space in addition to the zoning-allowed floor area. A central courtyard, also recessed, provides daylight and views that make the library, social services, and other common areas on this floor feel as though they're at grade. Further boosting the buildable square footage, an economical block-and-plank structure, consisting of CMU bearing walls and precast concrete-plank floor slabs, makes a floor-to-floor height of 9 feet viable. This enabled more units to be constructed within the site's height limit while still providing ceilings of 8 feet and higher for residents.

A high-performance envelope and energy-recovery ventilators provide benefits beyond energy savings. These include quality indoor air in a neighborhood with some of the worst asthma rates in the country and quiet interiors despite the proximity of highway traffic.

The building's material palette was carefully selected to reinforce the project's values. Cost-effective brick cladding conveys a sense of dignity and permanence that's especially welcome in what may be residents' first experience of housing stability in years. Brick also lines the walls of the lobby, where it is corbelled to create patterns and plays of shadow in the daylight from generous windows to the courtyard. The lobby brick doesn't add significant cost, Reynolds says, "but it adds an incredible value for the people who are experiencing that space." Other common-area materials, chosen for their evocation of nature, include wood slats along the lobby ramp and wood-fiber ceiling panels, a low-cost choice for softening the space's acoustics. "We're trying to achieve multiple things through simple choices," Reynolds says. "For a client like Breaking Ground, which provides social services to their tenants, designing to support occupants' health and well-being can help save money in the long run."

As with Betances, the social and environmental performance of Coliseum Place, completed in 2022, resulted from a combination of funding- and mission-driven priorities. Located beside a commuter rail station, the six-story, 59-unit development for low-income and formerly unhoused families is adjacent to what's intended to become a larger transit-oriented development. With the nonprofit developer Resources for Community Development seeking to surpass the LEED



981 DAVIE SECTION/AXONOMETRIC DIAGRAM

Platinum rating that had become its standard, the project enrolled in the ILFI Affordable Housing Pilot. Pilot projects attempt a range of ILFI certifications (including Living Building Challenge, Core, Zero Carbon, and Zero Energy), with access to educational sessions, peer-to-peer discussions, and support from the institute's technical staff, all with the goal of breaking down barriers to deep-green housing. "We learned a ton about what's appropriate for affordable housing in terms of these aspirational goals," says DBA's Ackerly—"what it takes to get there, and also what it means when a certification is driving your goal-set versus supporting a set of inherent goals and quality assurance."

Built for construction costs of about $500,000 a unit—"which was pretty typical and pretty alarming at the time," Ackerly says, "and now of course costs in this market are even higher"—Coliseum Place consists of a simple stepped massing wrapped in a shade screen. A bamboo-filled exterior staircase connects common amenities, fosters active uses and social interaction, and provides both a close-up with nature and expansive views to San Francisco and the East Bay Hills.

Rooftop photovoltaics supply the annual energy needs of common areas in the all-electric building. Decentralized heat pumps reduce domestic hot-water energy loads by about 40 percent compared to a conventional central water heater. And air-conditioning and air filtration improve resilience in the face of increasingly hot and smoke-filled seasons.

In line with the pilot's ambition of reducing negative health impacts, both for residents and for workers, DBA specified toxin- and plastic-free interior finishes; however, in what Ackerly calls "a value-engineering sob story," a number of these were substituted out. Another aspect of the Living Building Challenge, the requirement that a building source all its water on-site and clean all the water it releases, was rejected from the outset. "There are good reasons that we have municipal-scale infrastructure," Ackerly says. "In asking what to prioritize, you really have to start with, 'What does this community need?'"

A grant-funded study that DBA conducted after the completion of Coliseum Place, however, suggests that there is a way in which affordable housing may be suited to doubling as infrastructure. The study's challenge was to design a multifamily building that eliminated all energy demand from the grid between 4 and 9 p.m., typically the period of maximum energy draw, when power plants have to ramp up production fast—burning fossil fuels to do so—and when, as a result, energy is dirtiest. Reducing energy use during this period can have a greater impact on carbon emissions than reducing energy use overall. The exercise revealed that an oversize central hot-water tank could serve as a thermal battery, heating water during off-peak hours and supplying it during peak hours without drawing further from the grid. (This is different from Coliseum Place's decentralized system, which focused on reducing total energy consumption.) The additional thermal storage uses a system that is already in the building—oversizing it even adds a level of redundancy that owners value—and could eliminate 35 percent of the building's afternoon peak for less cost than battery storage (another way of storing energy in buildings to reduce peak loads). "It's a really high-benefit, low-cost way to achieve this kind of evening-out-the-peak goal," Ackerly says, "and that should be the focus of everything right now."

Another project reevaluating the systems best suited to achieving affordable and environmentally responsible housing is 981 Davie Street, a 17-story hybrid mass-timber tower now under construction and targeting Passive

IMAGES: COURTESY ZGF

A STRUCTURAL SYSTEM combining CLT slabs and steel columns (above) should speed construction at 981 Davie (opposite), in Vancouver, British Columbia. The building will provide 154 affordable units.

House certification. Projected to cost $67 million, with federal, provincial, and municipal funding, and developed by the Community Land Trust in consultation with New Commons Development, the building includes a mix of units, from studios to three-bedroom, with 6,800 square feet of amenities and outdoor space. Located in a neighborhood known for its thriving LGBTQ community, the building includes 154 affordable units, with 31 of them designated as supportive housing for individuals and families living with HIV/AIDS, and houses in its two-story podium a nonprofit community center that works to improve queer, transgender, and nonbinary people's lives.

The City of Vancouver's green buildings policy requires projects subject to rezoning to achieve exemplary energy performance by either of two paths: the penultimate level of the province of British Columbia's Energy Step Code or Passive House certification. The 981 Davie team elected to target Passive House because the developer sees value in the quality assurance and reduced operations costs that achieving the standard represents, says ZGF project architect Daniel Wilson.

Because of the site's densely developed urban context, which offered no staging room at all, the project uses prefabrication for both structure and envelope. The structure is pioneering a hybrid system, developed by its engineers, Fast and Epp, consisting of hollow-section steel (HSS) for the vertical members and cross-laminated timber (CLT) slabs for the horizontal. The HSS is cheaper and lighter, and the connection detail is faster and simpler than it would be with comparable-strength timber columns, and the flat slabs eliminate the need for beams and facilitate the installation of services. To keep pace with the structure's speed of assembly while maintaining quality control and airtightness, the project uses a proprietary prefabricated envelope system, including operable triple-glazed windows and fixed shading devices. While there's an associated cost premium, Wilson says, prefabrication offers the potential for robust and high-performing assemblies, as well as significant savings from a construction schedule slated to take a week and a half per level, including structure, envelope, and balconies.

The use of prefabricated systems also affected the project's delivery method, since consultants, contractors, and manufacturers had to be brought on board earlier than would have been typical with tendering through a conventional design-bid-build process. Instead, the project is being delivered under a construction-management contract, with the general contractor preselected for advisory services during preconstruction and subsequently retained for construction. Portions of the project's scope were pre-bid by relevant subcontractors in advance of a comprehensive tender. "The provincial funding authorities weren't used to having to lock in certain players," Wilson says, "so that was an educational process." Ultimately, however, "as required for a publicly funded project, technically speaking all portions of the project were subject to competitive bidding between multiple prospective subcontractors."

In addition to the housing it provides, 981 Davie serves a significant policy goal: modeling the viability of advanced building systems for broader market uptake. "This project forms part of the tradition of the federal and provincial governments providing funding in order to make experimental, cutting-edge projects possible that ordinarily would be dismissed as unviable by the market," Wilson says. "If we want to create better living environments, the money for research has to come from somewhere. The argument here is that it doesn't have to be somehow underpinned by market value—that it's possible for the public sector to lead even market developments, and that it should do so."

In allocating their careful budgets for maximum social and environmental effect, all three projects, Betances Residence, Coliseum Place, and 981 Davie—as well as the many other high-achieving affordable-housing projects now being built—share in that leading role, showing what's possible. ■

CONTINUING EDUCATION

To earn one AIA learning unit (LU), including one hour of health, safety, and welfare (HSW) credit, read "Role Models," review the supplemental material found at architecturalrecord.com, and 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. Explain how public policy and funding streams help affordable housing achieve high levels of energy performance.
2. Discuss how materials choices can save money while supporting occupants' health and well-being.
3. Describe strategies for designing housing to reduce energy demand during peak hours.
4. Outline the anticipated schedule and energy-performance advantages of the structural and envelope systems designed for 981 Davie.

AIA/CES Course #K2405A

Architectural Record

COCKTAIL NAPKIN SKETCH CONTEST 2024

If you are a licensed architect or related professional who practices in the United States, you can enter this remarkable contest.

All you need is a white cocktail napkin and pen to demonstrate that the art of the sketch is still alive. Two grand prize winners will be chosen (1 licensed architect, 1 related professional). Grand prize winners will receive a $300 gift card and a set of cocktail napkins with their winning sketch printed on it! The winning sketches will also be announced at and utilized on napkins at our Innovation Conference in October.

The sketches of the winners and runners-up will be published in the November 2024 issue of *Architectural Record* and shown online in the architecturalrecord.com Cocktail Napkin Sketch Gallery.

SUBMIT SKETCHES BY AUGUST 26, 2024

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Entry form the size of 5 x 5 cocktail napkin, for reference.

HOW TO ENTER:

- Sketches should be architecture-oriented and drawn specifically for this competition.
- Create a sketch on a 5-inch-by-5-inch white paper cocktail napkin. You may cut a larger napkin down to these dimensions.
- Use ink or ballpoint pen.
- Include the registration form below or from the website.
- You may submit up to 6 cocktail napkin sketches, but each one should be numbered on the back and include your name.
- All materials must be postmarked no later than August 26, 2024.

For more information and official rules visit:
architecturalrecord.com/cocktail-napkin-sketch-contest

Due to the volume of entries, cocktail napkin sketches will not be returned.

SEND ALL SUBMISSIONS IN ONE ENVELOPE TO:

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Architectural Record
350 5th Avenue, Suite 6000
New York, NY 10118

BACKGROUND FEATURES
RAZAN HADIDI, 2023 WINNER

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In this section, you will find four compelling courses highlighting creative solutions for tomorrow's buildings brought to you by industry leaders. Read a course, and then visit our online Continuing Education Center at ce.architecturalrecord.com to take the quiz free of charge to earn credits.

Photo: Max Tuohey; courtesy of JDS Development

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Photo: Max Tuohey; courtesy of JDS Development

Multifamily housing continues to be in high demand in many settings around the world including New York City where the Brooklyn Tower has been completed – designed by SHoP Architects for JDS Development.

Multifamily Housing– More Popular Than Ever

Enhancing design, safety, and sustainability in higher density developments

Sponsored by Bison Innovative Products, Geberit, Meek Mirrors, LLC, and ProWood

By Peter J. Arsenault, FAIA, NCARB, LEED AP

Numerous publications have reported that urbanism, just like the human population, is on the rise all around the world. With that trend comes a denser built environment based on an urban fabric that promotes free circulation and multifamily, multistory housing. Even in predominantly suburban and rural settings, pockets of multifamily housing are found to create village-like atmospheres and walkable communities. In virtually all cases, good multifamily housing design includes comfortable, up-to-date living units combined with appealing common amenities with sustainable and green building design seen as a top priority for residents–and for sales efforts. In numerous housing markets, multifamily housing, such as condominiums or townhouses, is also seen as an affordable option for many with the purchase price of single-family housing out of reach for many first-time home buyers. With all of these considerations as a background, this course looks at some of the techniques, approaches, and latest product offerings available to satisfy some of these varied design criteria for successful multifamily housing projects.

DESIGNING OUTDOOR SPACES

While the tendency is to think first of the building when designing a multifamily project, the reality is that outdoor spaces are an important, and valuable part of any living arrangement. Such outdoor areas can be manifest in a variety of design features such as balconies, rooftops, terraces, and on-grade designs. These outdoor spaces allow residents and guests to enjoy the use of either an extension of indoor living areas or a separate, public outdoor amenity space. As such, they can provide users with desirable features such as outdoor kitchens, fire pits, bars, living areas, gardens, green roofs, pool areas, seating areas for reading, recreation spaces, and other desired uses.

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Learning Objectives

After reading this article, you should be able to:

1. Investigate the beneficial wellness attributes to people of incorporating outdoor living spaces using pedestal decks in multifamily buildings.
2. Assess options for interior design that enhance wellness, design quality, and affordability in multifamily buildings.
3. Explain the significance of properly used and specified fire-retardant-treated wood (FRTW) for structural uses that address the safety of people and the protection of property.
4. Determine the options to incorporate in-wall plumbing fixtures to enhance cleanliness, health, and compliance with accessibility requirements in living units.

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.

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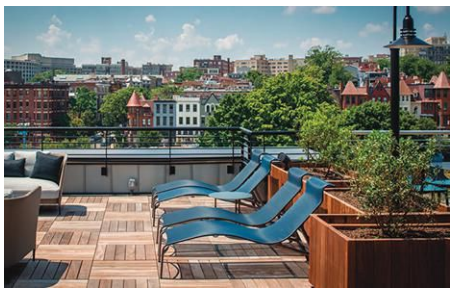

Standard outdoor deck components can be customized and used creatively to create sustainable and wellness-focused outdoor amenity spaces in multifamily buildings as shown here at the Reed Row Apartments in Washington, D.C., by R2L:Architects.

Such outdoor amenities are not only appealing and marketable to prospective residents, but they can also offer considerable benefits to the health and wellness of all who experience the natural elements of sun, wind, and vegetation. Rooftop decks help to boost morale and strengthen relationships within the community of residents in a multifamily building. They can also incorporate natural elements such as planters or vegetative materials and thus create biophilic design opportunities. Native plants and natural building materials offer occupants a visual and material connection with nature. Green spaces benefit occupants' health and wellness by enabling programmatic flexibility; these spaces can be used for recreation, refuge, and/or restoration.

Raised Modular Decks

The means to create appealing outdoor spaces is often realized by using a raised modular deck system. Such modular systems are versatile and give architects and others the design flexibility to create unique and beautiful rooftop environments and outdoor spaces. By utilizing adjustable height pedestals to support the deck, uneven or sloped surfaces can be easily accommodated. Architects can include a mix of pavers and surface materials including wood, stone, structural porcelain, crushed rock, grating, artificial turf, concrete, and planter cubes and benches, to create unique, custom looks. Versatile, adjustable pedestal deck systems can be utilized over any structural surface–on bare structural decks, rooftop decks, roof membranes, green roofs, terraces, compacted grade, pavement, pool surrounds, or in water features. Through the modular design of surface materials and accessories, designers can create an abundance of different design visions without the need for custom or costly materials.

Sustainability Features

Some manufacturers are dedicated to decreasing their impact on the environment by designing products that are part of a more circular economic system, such as using recycled and recyclable content. Similarly, wood tiles can be crafted from premium-grade remnants and harvested in an environmentally responsible method designed to preserve the economic viability of rainforest hardwoods. Wood tiles can be associated with governing groups such as the Forest Stewardship Council (FSC) to ensure they address quality standards and best practices of wood acquisition and plantation farming.

Once installed, pedestal decks can help to reduce a building's carbon footprint through a reduction in a roof's ambient temperature, potential for green space, rainwater collection initiatives, and/or reduced need for roof replacement). A raised, air-permeable, open-grid pavement system can help reduce the cooling loads of the building and facilitate water drainage. Incorporating a pedestal deck system can also provide pedestrian access to green roofs.

Modular deck systems can contribute to well-known sustainability rating systems including LEED, SITES, WELL, and other green building certification systems. Incorporating outdoor raised deck areas in multifamily projects provides multiple opportunities to create more sustainable and healthier living environments.

FIRE SAFETY

Fire safety has long been a primary concern in all multifamily properties. While property fires continue to happen across all building types, one-or-two-family dwellings annually account for the largest number of fires followed next by apartment or multifamily dwellings. Of significance, when multifamily dwellings burn, they often impact more people and more households than single-family homes and lead the way in injuries and fatalities. This has been exacerbated by the recent growth in wildfires which has impacted entire communities. As such, many localities are adopting Wildland-Urban Interface (WUI) codes that require greater fire resistance in residential construction of all types in order to provide a larger time frame for people to escape fires. In all cases, the choice of materials used to achieve adequate or required fire resistance becomes a significant point of design and specifications.

One- and two-family construction is routinely based on wood framing and sheathing, but increasingly, so is multifamily housing. This is due to several factors. First, it is often the most economical choice that is easy to work with using well-known carpentry tools and methods. Second, wood is still one of the most environmentally friendly and energy/carbon-saving materials in construction. This has prompted the growth of multifamily buildings using wood structural systems and even mixed-use buildings with concrete "podiums" for the lower level(s) and wood-constructed dwelling units above. Finally, updates to the International Building Code (IBC) have recognized that wood members with larger mass or with fire-retardant treatment can be as safe or even safer than steel framing, which can lose its integrity during fires.

Designing with Fire-Retardant Wood

In light of all of the above, fire-retardant pressure-treated wood (FRTW) in the form of dimension lumber and sheathing are now readily available which are code-compliant solutions for exterior walls and roofing. In multifamily construction, it can also be used for separation between units in some cases. More specifically, FRTW is wood impregnated with chemicals during manufacture that, has been tested under ASTM E84/UL 723 "Standard Test Method for Surface Burning Characteristics of Building Materials." In order to be code acceptable, the tested product must have a flame spread index of 25 or less and meet a Class A rating of 10 minutes plus no evidence of significant progressive combustion when the test is continued for an additional 20 minutes. While still considered a combustible material, code-acceptable FRTW does not support combustion, and its burning rate is limited when flame is applied.

The greatest advantage to using this type of product is found in the construction

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of mid-height multistory buildings such as apartment buildings built of the code-defined Type III construction. Type III-A includes exterior walls that carry a 2-hour rating with combustible materials allowed on the interior, but 1-hour rated floor. Type III-B is almost the same as III-A, but floors and roofs are not required to be fire resistant. FRTW is also permitted in some parts of Type I and II construction (often used in high-rise buildings) in certain locations as permitted in the IBC. In some jurisdictions, there is growing interest in protecting against wildfires by using FRTW in other building types as well. That means it could apply to Type IV construction for exterior walls and roofs and possibly even Type V if that were to be adopted.

While this is all good news for those who design, construct, or own multifamily buildings, it must be noted that the treatment process can affect the wood. Depending on the wood species (spruce, pine, fir, etc.), the type of product (stud, joist, plywood, beam), and its application (wall, floor, roof), the structural strength originally associated with the untreated wood is reduced somewhat when treated with a fire retardant. Therefore, the FRTW manufacturer is required to provide strength adjustments based on the intended use of the wood, which must be factored into the structural design of the building. In practical terms, that may mean that FRTW plywood is approximately 1/8 inch thicker than its untreated counterpart. Dimensional lumber may or may not be impacted enough to change any lumber sizing during design but is readily calculable.

Overall, fire-retardant-treated lumber must meet IBC code requirements for fire-retardant-treated wood as defined in IBC 2303.2 for wood used as a construction material. It must also be labeled according to the requirements in IBC 2303.2.4. With all of the familiar versatility of wood framing and sheathing, FRTW allows for creative designs that are safe, code-compliant, and economical.

Photos courtesy of ProWood

Fire-retardant pressure-treated wood (FRTW) is recognized as a code-acceptable option for framing walls and roofs for many multifamily buildings.

USING MIRRORS TO ENHANCE INTERIOR DESIGN

The interior design of multifamily living spaces, particularly bathrooms, often focuses on ways to help small spaces look or feel a bit bigger than they actually are. At the same time, they need to meet functionality requirements for convenience, cost limitations of development budgets, and market requirements for overall design quality. Often, this combination of criteria translates into clean, elegant, contemporary solutions that include not only material selections but also the selection of components and accessories that enhance the overall look of bathrooms in multifamily projects. In particular, the use of mirrors in such bathrooms becomes an interior design element that can address all of these design requirements and contribute to an overall living experience. Framed mirrors could act the same way as a piece of art that enhances a room, particularly if powder-coated colored frames are used. The mirror itself can reflect different room elements or aspects when viewed from different angles.

Mirror Types

While mirrors and medicine cabinets are common design components for bathrooms, there are lots of options to choose from. When selected and incorporated into an overall design, they can enhance the appearance and perceived quality of the entire multifamily property. From a marketing standpoint that means good interior design that includes tasteful, cost-effective lighting and mirrors can improve customer perceptions of a living unit. It can also be more advantageous to consider manufactured mirror products that meet not only the design requirements for a project but the construction schedule and cost aspects as well.

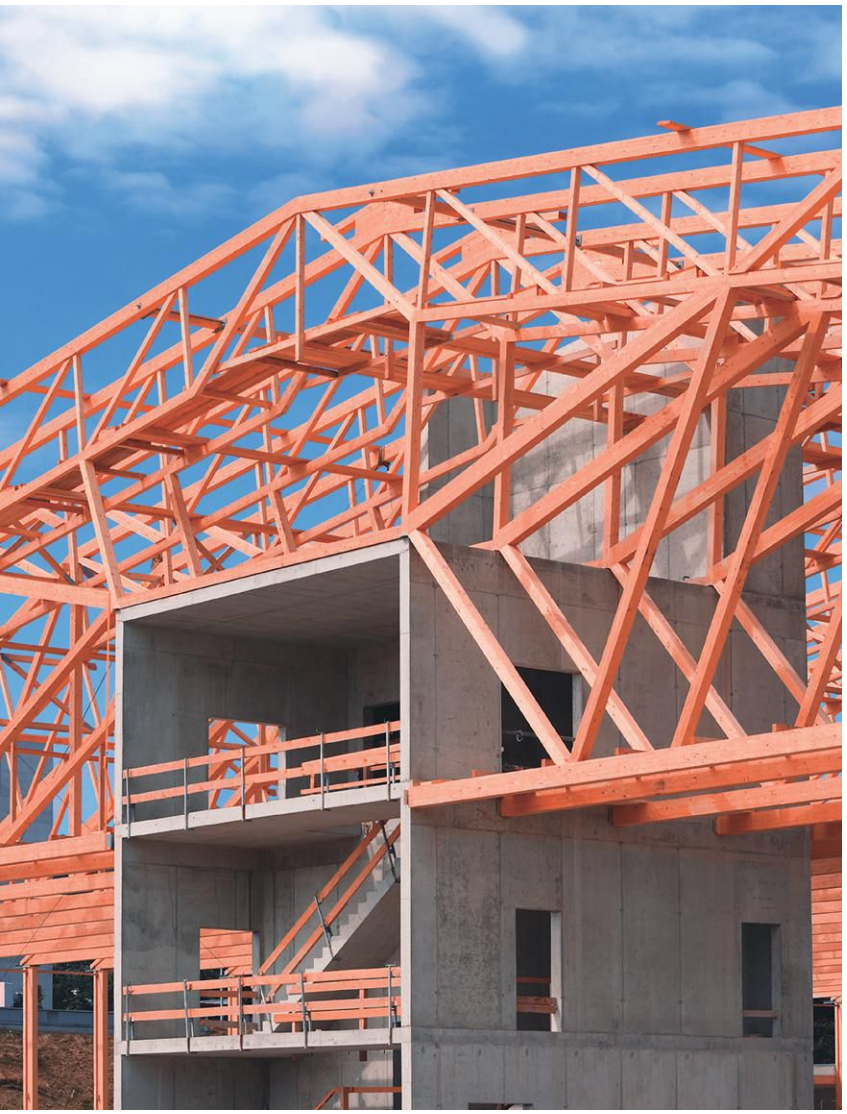
With the above in mind, here are some of the basic options to consider.

Frameless Mirrors: This is a classic, economical choice with crisp, clean edges that allow for full-width visibility and edge-to-edge reflection. It is great for areas with smaller dimensions or a tight-fitting installation. Installation is very straightforward with multiple mounting options available such as clips (metal or plastic), aluminum j-channel, standoffs, and mastic. The edges of the mirror can be flat-polished, pencil-polished, or beveled edge. They can be ordered in custom sizes but will likely be more economical when ordered in bulk for multiple dwelling units requiring the same size.

Floating/Infinity Mirrors: A more elegant option uses a frameless floating mounted mirror. The frame is wholly or partly concealed with a depth that places the mirror edges out from the wall surface, thus giving it the illusion of floating or extending into "infinity." The frame depth is customizable to suit different design needs and theft-resistant concealed mounting is available. Such products are generally made to order in custom sizes but ordering in quantities may help with the pricing.

Framed Mirrors: Rectangular mirrors with a metal or wood frame can provide a traditional or contemporary look that can be selected to meet a range of design intents. Wood-framed products can be specified by selecting from a wide variety of molding profiles. Metal framed mirrors can have a clean and simple look with a stainless-steel frame and mitered corners. A variation on a flush, framed mirror is an ADA-compliant fixed tilt mirror, which has a frame that is thicker on the top than it is on the bottom in order to achieve the needed tilt angle for someone in a wheelchair to use. In all cases, the mirror frame can be integrated with a concealed mounting system which can reduce the time and cost of installation.

Rounded Rectangular Mirrors: For a



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The use of mirror products with different framed or frameless choices and finishes can enhance the interior design of multifamily bathroom spaces.

more contemporary look, mirror products are available with a metal frame that has rounded corners and a small floating gap. Not only are they more elegant, but some have a very easy, safe mounting system, saving the building owner expense in the installation process. Rounded mirrors or pill-shaped mirrors are also seeing a resurgence in popularity.

LED Lighted Mirrors: Most bathrooms require lighting around the mirror, and LED lighting technology is being directly integrated with the mirrors. Whether lighted from behind (through a frosted or etched area) or a simple halo effect around the edge, this approach is becoming very popular with both renters and owners. LED technology draws very little power while giving additional ambiance to the installation. Upkeep is simple as the lights typically last 30,000 to 50,000 hours. The lighting not only provides even and useful illumination for the user but can enhance the design of the space with controllable light qualities. Mirrors can be backlit or side-lit with different frosting options over the LED lighting which can range in color between 3000k, 4000k, 5000k, and 6000k. In all cases, UL-tested and rated products are available and should be selected for electrical safety.

Regardless of the type selected, manufactured mirror products can influence the marketability and design quality of multifamily spaces while helping to meet budget and scheduling constraints.

GREEN, EFFICIENT BATHROOMS

Interior living space is at a premium in popular urban and suburban areas across the United States. Nonetheless, residents of multifamily buildings are generally willing to live in denser settings as long as they align with their values and meet their lifestyle requirements. It has also been documented that residents highly prioritize amenities that meet sustainability and eco-friendly design standards, not just for energy but also in bathrooms where water conservation is essential. According to a Nielsen survey, 73 percent of millennials are willing to pay more for sustainable solutions. They indicate that "Despite the fact that Millennials are coming of age in one of the most difficult economic climates in the past 100 years, they continue to be most willing to pay extra for sustainable offerings–almost three out of four respondents."

Beyond the green building preference, these consumers also want smart tech, and they routinely prefer well-designed, and upscale bathrooms that work with the overall design intent of the project. In many cases, there is a need to provide accessible bathrooms, too, with the need to provide proper clearances and spaces around bathroom fixtures. This all needs to be balanced with an efficient layout that doesn't take up extra square footage, particularly when budgets are being scrutinized.

Concealed Installation Systems

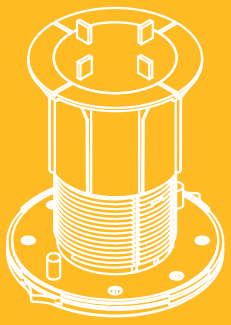
Many of the observed trends and desires for bathroom design in multifamily units can readily be satisfied by paying attention to the types of plumbing fixtures used. A very popular European approach that has been the norm for decades uses fixture systems with many of the functional parts behind a finished wall. Such in-wall installation systems improve the overall aesthetics of the bathroom design because they remove unsightly hardware—for example, the toilet tank—from view. In-wall systems for toilets, urinals, bidets, and washbasins are based on a concealed steel frame that attaches inside the wall and supports wall-hung plumbing fixtures.

As a result of this concealed approach, the visible part of the fixture seems to "float" in the bathroom, creating visual appeal and some added practicalities. In-wall fixture systems open up the entire floor for easy floor cleaning under the "floating" fixture. These fixtures also stay clean longer since there are fewer seams and crevices than traditional fixtures for dirt and germs to accumulate. Since some of the fixture is moved into the wall, greater accessibility can be achieved–there are fewer obstructions and more clear floor space than in a standard bathroom setup. Of particular importance in multifamily buildings, the system is designed to operate more quietly than a standard floor-mounted toilet, reducing noise transfer from space to space.

Water Management

An in-wall toilet system offers particular water efficiency benefits in a multifamily building. According to the U.S. Environmental Protection Agency (EPA), the highest percentage of water use in buildings comes from domestic restrooms. This makes the size of the toilet tank particularly important. Though the standard flush volume is 1.6 gallons, for sustainable projects, especially in regions with water conservation needs, a reduced size tank at 1.28/0.8 gallons per flush is becoming more desirable.

The design of the flow mechanism and the controls that actuate it allow for good performance using reduced amounts of water. Just as importantly, toilets with dual-flush controls are common, since they allow the user to determine how much water is used for each flush appropriate to the need. With such dual-flush technology built-in, a household or facilities manager can reduce their water usage by thousands of gallons of water per year. In-wall toilet



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In-wall toilet systems conceal the supports and plumbing in the wall and allow for a cleaner, more elegant appearance when projects are completed.

installation systems typically include such dual-flush technology activated by touch (or touchless) panels flush-mounted on the wall above the toilet.

Bluetooth-enabled touchless actuators and buttons are an option for hygiene and water management in both residential and commercial settings for owners and property managers. With an app, the battery level can be checked, and settings can be adjusted from a distance. All devices can be configured and grouped by units or locations, water usage data can be exported, and even a cleaning mode can be set in advance. This provides a time-saving solution to water management and maximizes water savings in individual condominiums or an entire multifamily building.

SPECIFYING OUTDOOR DECK SYSTEMS

Modular pedestal deck systems are versatile and can be incorporated into almost any multifamily project to create usable, sustainable, and affordable outdoor spaces. They consist of standardized components that can be selected, specified, and customized to meet project needs, budget requirements, or green building goals. Regardless of where or how they are used, though, adjustable deck systems commonly incorporate three types of components as described in the following sections.

Deck Supports

Fixed or adjustable height pedestals are the fundamental support system for outdoor decks and have become recognized as one of the most labor- and cost-efficient methods of creating a level deck over a moderately sloped surface. High-density polypropylene plastic makes them impervious to water, mold, and freeze-thaw cycles. Their adjustability offers tremendous design flexibility compared to traditional deck-building materials and methods. Using a gravity system, the supports do not penetrate but rather protect roofing and waterproofing membranes thus causing no damage or harm to the surface below. The pedestals can be used to elevate the deck surface to meet the threshold, therefore providing an even and level transition from one space to another. This allows easy access for building occupants with varying levels of mobility.

Deck Surfaces

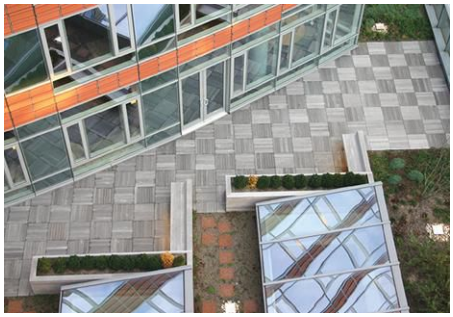
The versatility of adjustable pedestal deck supports means that they can be used to elevate a variety of decking surface materials. The common options include pavers made from concrete or stone, such as granite or travertine. Similarly, structural porcelain tiles, fiberglass grating, composite materials, or conventional wood decking systems can be used in a grid pattern to meet different design requirements. Typically, a galvanized steel paver tray is adhered to the back of structural porcelain pavers or other materials prone to breakage to provide impact resilience and additional strength. The paver trays are available in a variety of standard sizes, compatible with large format ceramic tiles, and allow accommodation for thicknesses of 2 cm. With or without a support tray, the deck surface materials can be removed during building use for routine maintenance, repairs to the roof, or to gain access to other systems.

If a lighter-weight surface material is preferred or required, wood tiles are a good alternative, weighing only one-third as much as concrete pavers. Typically made from hardwoods in a variety of species, wood tiles are generally commercial-grade products. If maintaining the wood color is desired, wood tiles can be periodically cleaned and sealed. Left to weather naturally, the wood tiles will develop a silvery-gray patina. Wood tiles can be crafted from premium-grade remnants and harvested in an environmentally responsible method designed to preserve the economic viability of rainforest hardwoods.

Continues at ce.architecturalrecord.com

Peter J. Arsenault, FAIA, NCARB, LEED AP is a nationally known architect and a prolific author advancing more livable solutions through better design. ***www.pjaarch.com, www.linkedin.com/in/pjaarch***

Photos courtesy of Bison Innovative Products



Modular wood tiles on raised deck supports provide a welcome variety of outdoor spaces at the LEED Platinum Certified Visionaire Apartments in New York City designed by the architectural firm of Pelli Clarke Pelli.

PRODUCT REVIEW

Multifamily Housing–More Popular Than Ever

Bison Innovative Products

Photo courtesy of Bison Innovative Products

Bison Rooftop Deck Systems

Bison Pedestals are manufactured in Denver, Colorado, with 20% post-industrial recycled materials and have patented features that improve performance and stability. These versatile, adjustable pedestal deck systems create level rooftop decks over sloped surfaces, support a variety of different surface materials, and can be installed over any structural surface.

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Meek Mirrors, LLC

Rendering by Danica Lu

Rounded Rectangle LED Mirror

With its combination of clean lines and smooth curves, the Rounded Rectangle LED Mirror is a mixture of the most popular mirror styles available. The sleek design and the elegance of the LED lighting make this mirror ideal for any bathroom design.

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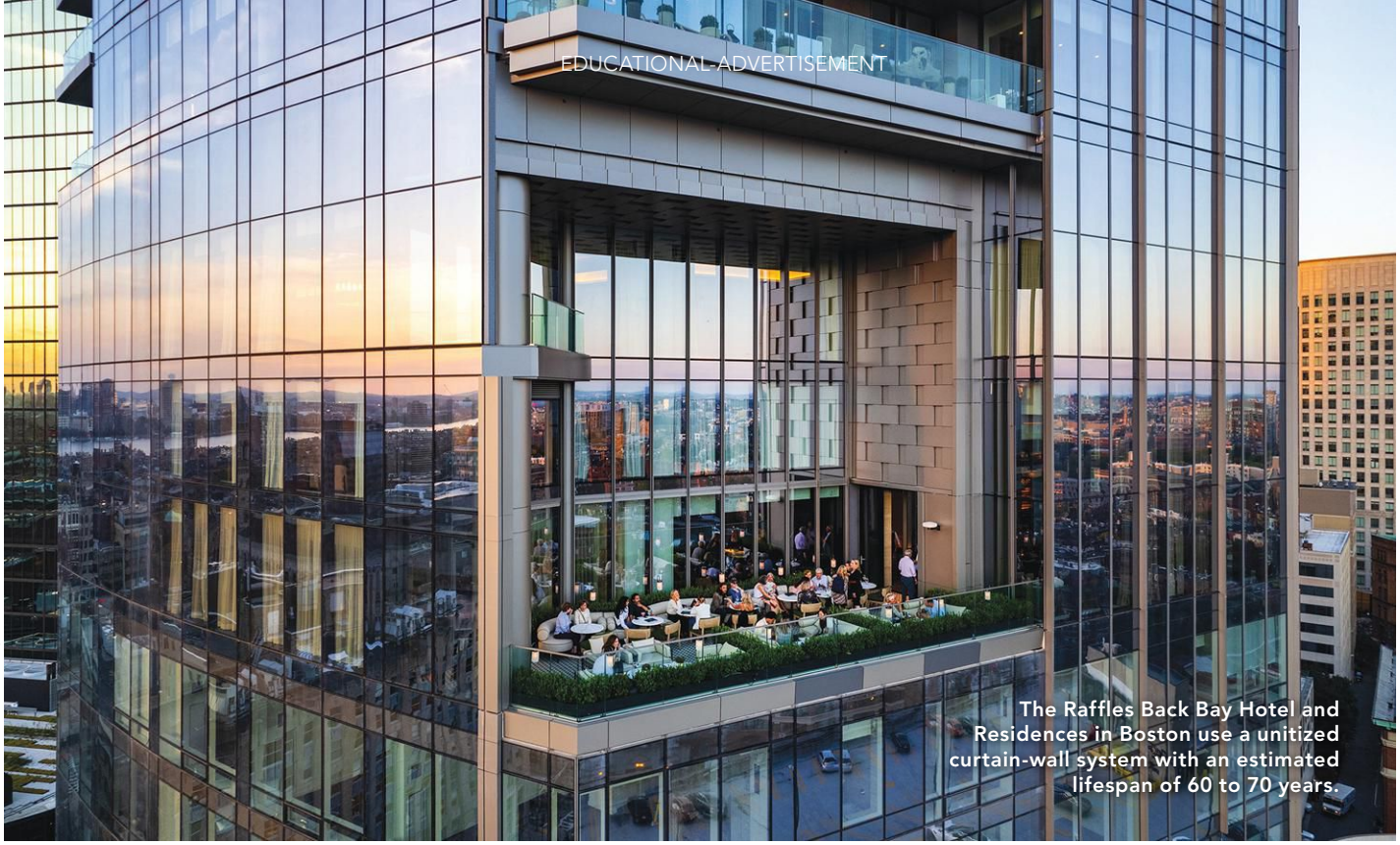

Photo: Ed Wonsek; courtesy of The Architectural Team

The Raffles Back Bay Hotel and Residences in Boston use a unitized curtain-wall system with an estimated lifespan of 60 to 70 years.

Longevity and Sustainability of Curtain Walls

Will your facade last a few decades or a millennium?

Sponsored by The Ornamental Metal Institute of New York

By William B. Millard, PhD

Designing a building with sustainability, resilience, and longevity in mind calls for a recognition of complexity and interdependence. Each component of a building contributes to its embodied and operational carbon footprint, its occupants' experience, its architectural expression, and its economic performance. The building envelope is a particularly powerful determinant of these outcomes, since it comprises a large volume of materials, endures climatic and atmospheric stressors, and mediates between exterior and interior environments, transmitting or consuming widely varying amounts of energy in the process. The contemporary curtain wall, a product of over a century of technical evolution, can be one of a building's vulnerable points, showing its age faster than the rest of the structure does. The converse of that observation is that improving a curtain wall's quality and longevity is an opportunity to realize powerful gains in the whole building's performance.

The 2024 Design Challenge sponsored by *Metals in Construction* magazine and the Ornamental Metal Institute of New York, eliciting proposals to design the curtain wall system of a new building at least 50 stories tall for a site on Broadway in midtown Manhattan, posits at least a 75-year anticipated service life for the proposed systems. This represents a substantial extension of the longevity commonly observed and expected in contemporary practice, say several experts in sustainable envelopes.

Mic Patterson, ambassador of innovation and collaboration at the Facade Tectonics Institute (FTI) and a member of the Design Challenge jury, cites a remark by Anthony Wood, executive director of the Council for Tall Buildings and Urban Habitat, at an FTI conference. "He said, 'How long should a building last? It should last until we're done

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GBCI 1 GBCI CE HOUR

Learning Objectives

After reading this article, you should be able to:

1. Apply your understanding of new efficiency properties for facade design with the goal of increasing curtain-wall longevity and reducing embodied carbon.
2. Learn serviceability characteristics that can contribute to the life cycle of a curtain wall.
3. Analyze the recyclability potential of constituent parts of a curtain wall.
4. Balance resilience and sustainability attributes with properties promoting healthy interior environments for occupants to achieve the best performance and aesthetic goals.

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with it,' which I think is the right answer.... They should be modifiable, adaptable, and repairable as need be until we are completely done with them." There is no one-size-fits-all criterion for a facade system's durability, Patterson says. "It needs to be adaptable enough to accommodate changes in use and all of the forces of obsolescence."

Patterson commonly encounters facade contractors' expectations of 20 to 35 years for the life of a curtain-wall system, with 50 years as the customary upper limit, and he finds these figures unnecessarily low. "That ignores the synchronicity that needs to exist between the aspirations for the building itself and the facade system," he continues. "If you've got a building that is designed to last 100 years and a facade system that's still designed to last 75 years, you end up needing a new facade system before the building expires. And if you put a new one on there, that's good for another 75 years, then you lose 50 years of facade-system service life. And so there's all kinds of wasted durability going on in buildings and facade systems just because we don't pay attention to that." There is no reason, he believes, that certain buildings reflecting the most advanced realistic design and construction practices—coordinating components' durability rather than leaving it to chance—cannot last a century, perhaps even 1,000 years.

In the U.S. curtain-wall industry, Patterson reports, it is common to market systems with a 35-year expectancy as "zero-maintenance systems to the building owners, which is what they want to hear. Basically, what we're saying is, 'This thing is good for 35 years, and then it's done,' because there's no way to maintain it or retrofit it." With few options for replacing or upgrading a facade system, "the only viable economic strategy in too many cases is to just rip the entire thing off and put a new one up"—the antithesis of sustainable practices, particularly when designs unwittingly create obstacles to the disassemblability, reuse, and recycling of materials.

The concept of zero maintenance, though attractive from a short-term perspective, appears roughly as realistic as a perpetual-motion machine. Patterson and other commentators contend that more farsighted approaches are within reach, however, for professionals who take a long-range view of the material cycles involved in design and product choices.

SYSTEMIC AND COMPONENT LONGEVITY

"Facade-related design decisions often come with tradeoffs," comments Isabelle Hens, environmental designer at the San Francisco office of environmental design consultant Atelier 10. "The window-to-wall ratio will impact embodied carbon, since the glazing assembly will have a different embodied carbon than the opaque assembly; operational carbon and thermal comfort, since it will alter the solar heat gains; interior occupant experience, since the window-to-wall ratio determines how much daylight and direct sun enters the space; and exterior architectural expression, by changing the facade articulation." Decisions about each of these factors are best taken holistically, she adds, rather than assessing components in isolation.

The lifespan of a complete system comprises the lifespans of its parts, which frequently differ. Vishwadeep Deo, facade consultant and vice president at Thornton Tomasetti, points out that once a curtain-wall system is installed, its enclosure infrastructure is "derived from multiple different components and pieces. Individually, those component pieces themselves have a very different lifespan; some could go away within 20 [to] 25 years and need to be replaced, while some of the others with metal in the enclosure could last up to 75 and beyond."

Expectations for the durability of aluminum, glass, and other materials depend on multiple variables, Deo notes, including location, exposure to assorted destructive forces (weather, salinity, ultraviolet light, and pollutants), and maintenance cycles. A building in a marine environment will face high risks of corrosion, as will one exposed to acid rain. A system that includes sealants will need periodic inspections and replacements. A curtain wall system's design can add to these variables, he continues; even if an owner performs regular maintenance and preserves the overall integrity of a facade, sections of it may be inaccessible and may fall into neglect.

Curtain-wall technology has progressed considerably over the decades, steadily improving in thermal performance while generating challenges in serviceability and durability. Brian McFarland, AIA, principal at CetraRuddy, traces the evolution of facade technology from early examples like SOM's Lever House, the second curtain-wall building in New York City (after the United Nations Secretariat Building), to today's unitized curtain walls and insulated glass units (IGUs). After "stick-built curtain wall, which was aluminum extrusions that you then applied glass to, and then you put a pressure plate on the outside of the glass," came unitized curtain walls in four- to five-foot units going floor to floor, a less continuous skin than the previous generation's "multi-floor continuous verticals."

Further improvements included thermal breaks with nonconducting isolators at the pressure plate, then structurally glazed curtain walls with "no metal on the outside of the wall, so even though it's not the greatest insulator in the world, you do have the IGU outside of the metal to create some thermal break between the exterior environment and the metal." The unitized curtain wall improves speed of erection and reduces labor costs; it is "one step better than what we used to call thermally broken, but it does also have its issues," McFarland continues, including thermal bridging from aluminum framing behind the glass and condensation from insulation on spandrel panels with a galvanized back pan for protection during shipping.

IGUs came to dominate curtain walls around the 1980s, replacing the early single glazing of the cheap-energy era predating the 1970s petroleum crisis, improving on early curtain walls' poor insulation with a modular assembly: a frame, double (later triple or quadruple) glazing, spacers, hermetic sealants, thermal breaks, and optional components including interior thin-film coatings, fritting, and argon, krypton, or a vacuum to reduce heat conductivity in the cavity between the panes.

Continues at ce.architecturalrecord.com

Bill Millard *is a New York-based journalist who has contributed to* Architectural Record, The Architect's Newspaper, Oculus, Architect, Annals of Emergency Medicine, *OMA's* Content, *and other publications.*

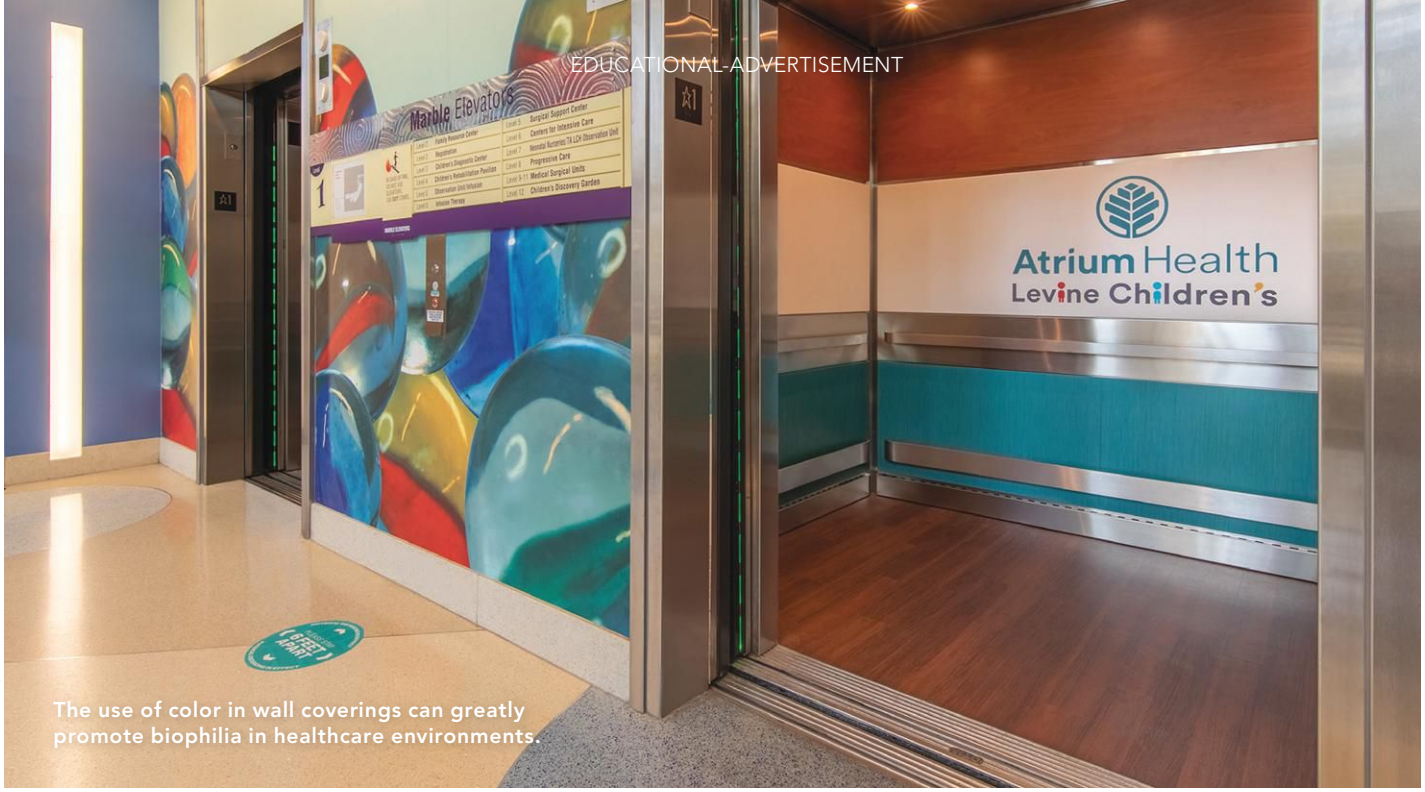

Photo courtesy of Inpro

The use of color in wall coverings can greatly promote biophilia in healthcare environments.

Going Above and Beyond with ADA Compliance

Creating spaces that are safe, welcoming, and healthy for all occupants

Sponsored by Inpro Corporation | *By Andrew A. Hunt*

Architects are in the unique position today to design interior spaces that are more welcoming, safe, functional, and accessible than ever before. The definition of well-being has shifted in recent decades, and now it includes emotional health as well as the physical health of occupants. The promotion of emotional well-being raises interesting and challenging questions for architects and designers. How can we enhance the design of interior spaces and promote biophilia to bring the warmth of nature into the built environment? Can we go beyond the basic requirements of the Americans with Disabilities Act (ADA) to create spaces that aren't just compliant with regulations but welcoming for all occupants? How can we incorporate the concept and guiding principles of universal design into projects to create safe, accessible, and healthy environments for everyone?

This article will explore the concept of universal design and explain the benefits to occupants when these principles are thoughtfully included in projects. Also, this article will dive into the Americans with Disabilities Act (ADA), providing an overview of the history, impact on the built environment, and current regulatory protections offered to people with disabilities. Specifically related to the ADA, it will provide direction on signage in commercial spaces, schools, and hospitals. Next, this article will discuss the positive aspects of specifying wall protection and murals that can calm occupants of all ages, young and old, and encourage a more meditative and peaceful space through biophilic art. Finally, we will explore some other related design elements that can create a more healthy and safe space, both emotionally and physically, for occupants. Examples such as the specification of cordless blinds to protect children; non-gender bathrooms designed to create inclusive, private, safe, secure, functional, and accessible spaces; and "emotionally safe" rooms in schools where children can express big feelings in appropriate private areas.

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1 ADA STATE ACCESSIBILITY/BARRIER-FREE

Learning Objectives

After reading this article, you should be able to:

1. Describe the concept of universal design and how the seven guiding principles can impact the health and safety of occupants in the built environment.
2. Discuss the role signage plays in ADA compliance in supporting the well-being of people with disabilities.
3. List the emotional benefits of incorporating biophilia into the design of signage, wall protection, and art for occupants of all ages.
4. Explain how elements like cordless blinds and inclusive gender neutral bathrooms can create a more welcoming and accessible space for occupants and visitors.

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THE SEVEN PRINCIPLES OF UNIVERSAL DESIGN

Universal design is a principle that aims to create environments and products that are accessible and usable by people of all abilities, ages, and backgrounds. In the realm of commercial architecture, architects play a pivotal role in ensuring that their designs adhere to universal design principles.

It's important to design around inclusivity and accessibility for both legal and ethical reasons. For example, the Americans with Disabilities Act (ADA) in the United States mandates accessibility requirements for buildings around design features including ramps, handrails, elevators, parking, door width, and more. Planning for accessibility from the get-go can, at minimum, help avoid design headaches later in the process, and will prevent legal issues from arising.

Ethically, a building designed in such a way that all occupants can navigate and utilize the building's facilities independently creates a sense of belonging and empowerment.

Photo courtesy of Inpro

One of the principles of universal design refers to designs that communicate messaging effectively, regardless of ambient conditions or the user's sensory abilities. Here the restroom sign incorporates visual reference, language, and tactile (braille).

The Guiding Principles of Universal Design

There are seven principles that guide universal design, which were developed by a team of architects, product designers, engineers, and environmental design researchers at the Center for universal design at North Carolina State University and first published in 1997.[1] The Center is no longer operational, but the principles established there have influenced policy, law, international agreements, and design across the world.

The first principle is equitable use, which essentially consists of the core meaning of universal design–a design that is useful to people with diverse abilities. Entryways that utilize power doors with sensors and sports arenas that have integrated and adaptable seating are examples of design for equitable use, which provides equivalent means of use for various users when identical means aren't possible.

Flexibility in use is the next principle, which refers to design that accommodates a range of preferences and abilities for use, and one that offers choice when applicable. Scissors designed for right- or left-handed users are an example.

A third principle is simple and intuitive use for people with varying experience, knowledge, language fluency, and concentration levels. Simplicity and consistency are key. An instruction manual that utilizes drawings instead of text is a great example, as it side-steps questions about what language or vocabulary level its reader might have.

Perceptible information is the fourth principle. This refers to designs that communicate messaging effectively, regardless of ambient conditions or the user's sensory abilities. Communications become more perceptible as they are made through more avenues. For example, a thermostat that utilizes tactile, visual, and audible cues is easier for more people to use.

Universal design also prioritizes a tolerance for error by minimizing hazards and any consequences that may come from accidental actions. One way to do that is to provide fail safe features, like a car key that is double cut so that it can be inserted into a keyhole in either direction.

Designs that require low physical effort increase accessibility, as well. This may mean various things in design function, but goals include minimizing repetitive actions and sustained effort, and allowing users to maintain a neutral body position. A sink that has a lever handle, for example, takes less effort to operate than one with a knob handle.

The final principle of universal design is appropriate size and space for approach and use of an implement, regardless of a user's body size or mobility. A drinking fountain, for example, should have a front-facing control button and be at a height that both standing and sitting users can operate.

To bring together all the universal design principles, consider the elevator. An elevator is a great tool for people with varying abilities.

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Andrew A. Hunt *is Vice President of Confluence Communications and specializes in writing, design, and production of articles and presentations related to sustainable design in the built environment. In addition to instructional design, writing, and project management, Andrew is an accomplished musician and voice over actor, providing score and narration for both the entertainment and education arena.* ***www.confluencec.com, https://www.linkedin.com/in/andrew-a-hunt-91b747/***

While breakdowns in the hot water system once plagued Ruby's Inn near Bryce Canyon in Utah, a tankless hot water system retrofit solved the problem.

Photo courtesy of PERC

The Future of Hot Water in Commercial Operations

Tankless Water Heaters Save Energy, Money, and Space with Next-Level Technology

Sponsored by PERC — Propane Education & Research Council

By Kathy Price-Robinson

A steady flow of hot water is like good health; you don't appreciate it until it's gone. Hot water is critically needed in commercial operations, where its absence can mean the difference between making a profit or not, keeping the doors open or closing up shop. How can a hotel, restaurant, fitness center, hospital, care center, school, or other facilities stay open without hot water? They can't. Still, threats to a steady supply of hot water plague establishments daily: aging storage tank systems, overloaded systems, broken systems, and more.

Considering the critical need for hot water in commercial operations, architects, designers, specifiers, and property managers should understand what can go wrong when the flow of hot water lessens or stops, and the potential for natural gas or propane tankless water heaters—which also save energy, money, and space—to solve the problem.

THE PROBLEM: LACK OF HOT WATER = DISGRUNTLED CUSTOMERS

Consider this situation at a historic, sprawling establishment in Utah. When up to six tour busses simultaneously roll up to the iconic Ruby's Inn complex on the edge of Bryce Canyon National Park, the travelers tumbling out of the busses usually want one thing above all: a hot shower. Upon arrival, the visitors would not be aware of the strain that dozens of concurrent showers put on the tanks of a conventional hot water system. The visitors would not know about the tons of laundry done by the staff every day. They wouldn't realize that Ruby's Inn is 25 miles from the nearest natural gas line. The customers have likely been on a bus for hours. They simply want hot showers when they arrive. But if the massive complex with hundreds of hotel rooms and an RV park fails to deliver the required hot water, bad reviews

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Learning Objectives

After reading this article, you should be able to:

1. Identify the critical hot water needs for commercial operations and the limitations of storage tank systems.
2. Define the features and benefits of tankless hot water systems.
3. Identify myths and realities of tankless systems.
4. Discuss major retrofit projects to replace failing storage water heating systems with tankless systems.
5. Describe innovations and the future of tankless water heating.

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and refund requests are sure to follow.

That is where the business found itself several years ago with a faulty and failing storage tank hot water system. The inn was founded in 1916, long before Bryce Canyon was a national park. Over the decades, the inn expanded and rebuilt to its current size of more than 700 hotel rooms and other amenities. That equals a massive demand for hot water and colossal repercussions when that hot water supply fails. The inn operators searched for a solution that would provide a more effective water heating system.

"Our goal was a reduction in the discounts we had to give," said Ron Harris, part of the management team at Ruby's Inn. "We had to completely refund a room and sometimes an entire building block because guests took a cold shower in the morning. We looked at about $60,000 a year in discounts and refunds." And with the refunds came less-than-favorable reviews. "Couldn't get water to a comfortable temperature," or "The water was barely warm," said reviewers on Trip Advisor in 2011.

The Solution: Propane Tankless Water Heating Retrofit

All those complaints stopped a few years ago when Ruby's Inn underwent a retrofit of its hot water delivery system. The solution ultimately included 175 new propane tankless water heaters with 35 tankless rack systems and four hybrid commercial water heating systems. With the more efficient tankless units in place, the resort has had no issues with hot-water supply or customer complaints, freeing staff time and money for other efforts at the resort. And perhaps just as importantly, Ruby's Inn saves about $6,000 per month on propane alone.

The online reviews of Ruby's Inn have certainly brightened in tone. "There was plenty of hot water," stated a reviewer on TripAdvisor in 2024, and "The water pressure in the shower was unbelievable and so hot that you hated to get out!" wrote another satisfied guest in 2023.

THE HISTORY OF HOT WATER

Hot water provides thermal comfort, a means of cooking, and cleanliness. To get these benefits, some ancient humans settled near hot springs, which naturally created and stored hot water. When Homo erectus learned to harness the power of fire around 1 million years ago, they heated water using skins on a stone-lined fire pit. Indigenous Americans heated stones in a fire pit and then transferred them to a container of water.

In ancient Greece, circa 5th century B.C., Homer and other Greek writers told us the Greeks, for whom athleticism was paramount, favored a variety of public baths for health and relaxation. During the Roman Empire, starting around the 1st Century BC, the Romans expanded the concept of public baths. According to historical studies, Roman baths were open to all citizens and allowed them to relax, mingle, and gossip, with separate baths for women and men. The baths consisted of heated rooms and pools, many sited to harness the sun's heat. Some systems, called hypocausts, employed water heated in fiery wood-burning furnaces beneath the raised floors of the baths. The resulting steam rose through chambers beneath the floors. Tiles and decorative mosaics lined the floors.

Public baths in the style of the Greeks and Romans did not catch on in the United States, partly because of taboos toward public nudity. Early American bathing focused on the "Saturday bath," a tin tub drawn into the kitchen and filled with water heated on the stove where family members took turns getting clean, presumably in preparation for Sunday church.

Photo courtesy of PERC

An array of tankless water heaters at Ruby's Inn saves energy and space and provides reliability to keep the establishment running smoothly.

Invention of Tank-Style Gas Water Heater

In 1889, a Norwegian immigrant in Philadelphia named Edwin Ruud invented the first automatic tank-style gas water heater. Advertisements at the time touted that water heating was no longer tied to the kitchen stove but was done in the basement, and you didn't even have to light a match. It was called a "mechanical masterpiece." After that, heating and storing large amounts of water in tanks until it was needed became the norm. The sound of a water heater firing off and on during all hours to keep the water within 10 percent of the thermostat setting until needed became a familiar scenario and a virtually non-stop consumption of natural gas, propane, or electricity.

Continues at ce.architecturalrecord.com

Kathy Price-Robinson** is a nationally known remodeling and construction writer. Her award-winning remodeling series titled Pardon Our Dust ran for 12 years in the Los Angeles Times.* ***www.kathyprice.com.

Ongoing Exhibitions

WATER PRESSURE: Designing for the Future
Hamburg, Germany
Through October 13, 2024
The Museum of Arts and Crafts (MK&G), in collaboration with the London-based design firm Jane Withers Studio, presents an exhibition examining solutions to today's water crises—scarcity, flooding, pollution, and disrupted hydrological cycles—from a global perspective. On display are over 75 works from the fields of design, architecture, art, and science, that open up new routes for change, with a special look at the ecological challenges currently faced by the port city of Hamburg. See mkg-hamburg.de.

Frank Lloyd Wright's Southwestern Pennsylvania
Washington, D.C.
Through March 1, 2025
An immersive exhibition at the National Building Museum presents a virtual exploration of five unrealized projects by Frank Lloyd Wright, designed between the 1940s and 1950s, examining how his vision of the future might have impacted Southwestern Pennsylvania's urban, suburban, and rural landscapes. Animated films, created by Skyline Ink Animators + Illustrators, use three-dimensional rendering technology to immerse visitors in the potential realities of Wright's unbuilt works including the Point (1947), a self-service garage for Kaufmann's Department Store (1949), the Point View Residences designed for the Edgar J. Kaufmann Charitable Trust (1952), the Rhododendron Chapel (1952), and a gate lodge for the Fallingwater grounds (1941). For more information, see nbm.org.

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Regional Insert

SNAPSHOT

Dedicated recluses needn't apply to LightBAR, an intimate rental development in the New Era Park neighborhood of Sacramento, California. The signature architectural feature of the courtyard-style apartment complex, designed by local studio REgroup, is a roughly 60-foot-long lighting element—a steel box-truss structure wrapped in translucent polycarbonate panels with LED strips lining the interior—that spans the entire length of the building while bridging above its front entrance from the street. After dark, the installation serves as a beacon and, from inside the courtyard, doubles as a projection screen for outdoor movie nights and other events. A gently sloping patch of turf, equipped with built-in landscape speakers, serves as "theater" seating. "It has allowed all the tenants to really get to know each other," says Gary Lewis, one half of REgroup alongside wife and partner Julia Lewis, of the screen-activated outdoor gathering space. "It's surprising when you know *everybody* that lives in your building—even if it's just 13 units." *Matt Hickman*

PHOTOGRAPHY: © JASON O' REAR

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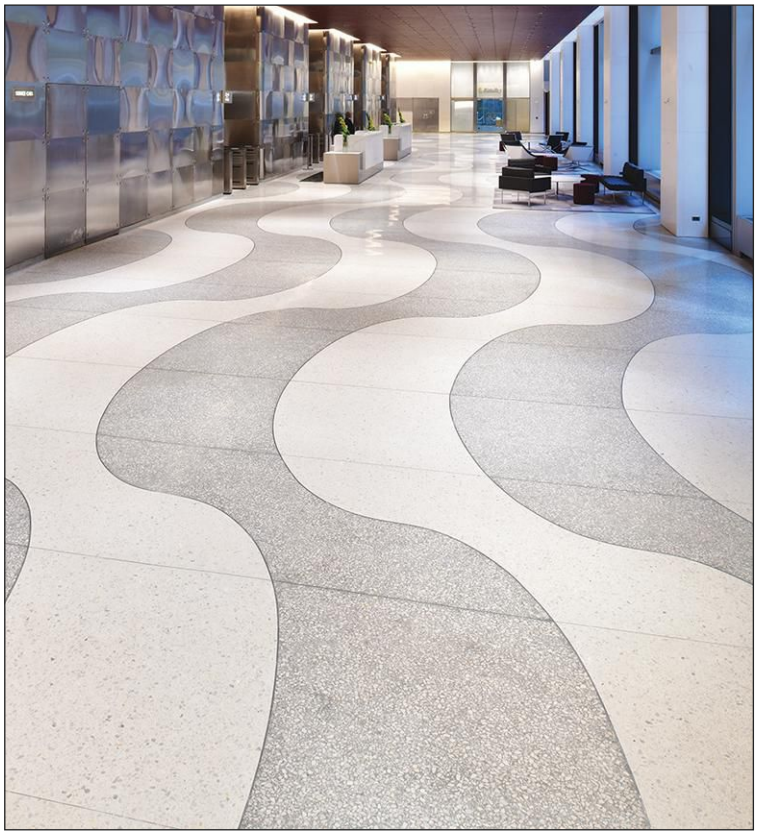

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