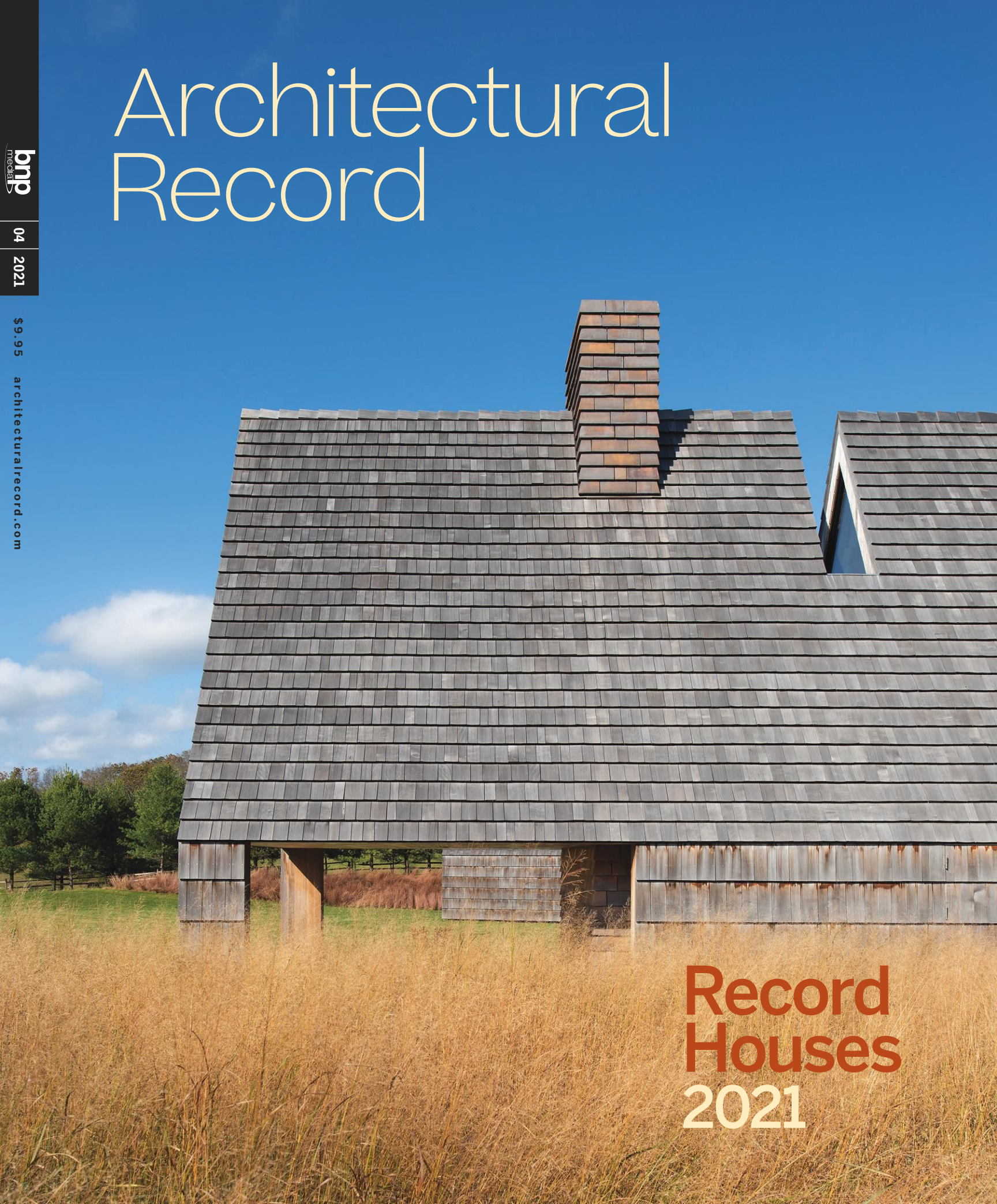
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Record Houses 2021



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Glazing Contractor: Infinite Glass and Metal, Inc.

Product: Fireframes® Curtainwall Series with Pilkington Pyrostop® fire-resistive-rated glass



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EGGER's particleboard and lamination facility in Lexington, N.C.

"In North America, we're thrilled to launch a collection that is thoughtfully designed to represent the wants and needs of this market," said Michaela Gimpl, Decor Management Expert at EGGER. "With this collection, customers can be confident they will find the perfect decors for their projects, with the quality and innovation our life-long customers have come to expect from EGGER products."



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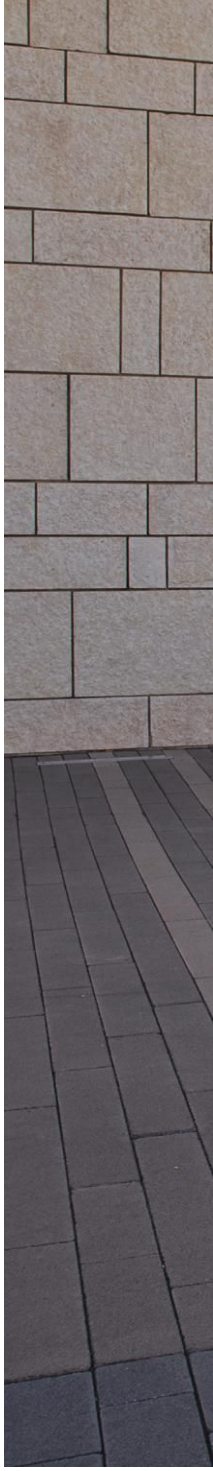
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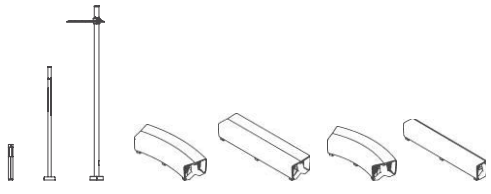
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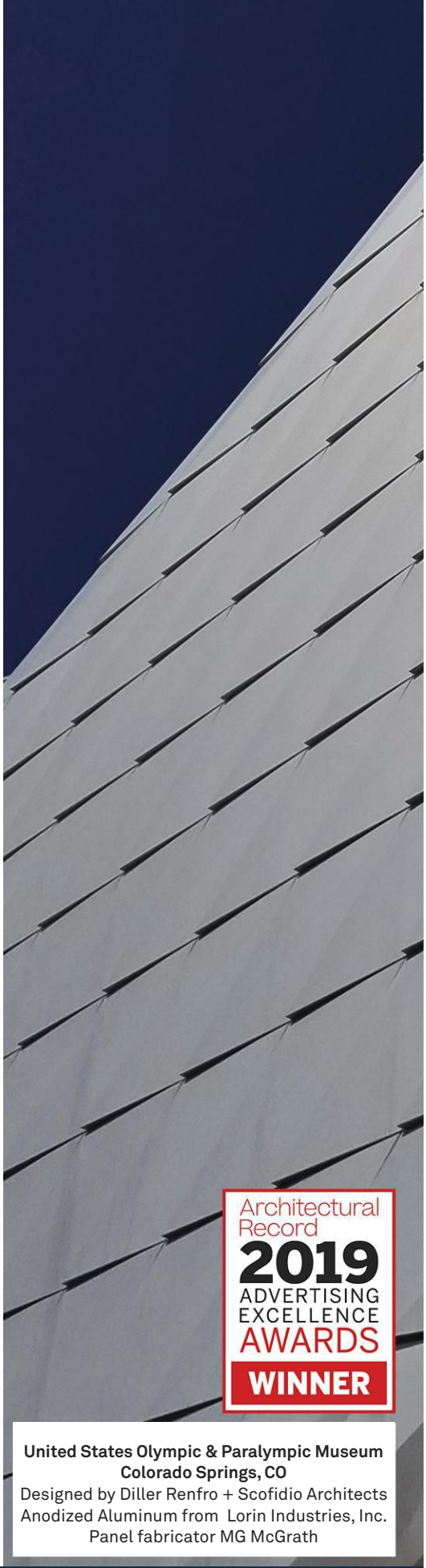
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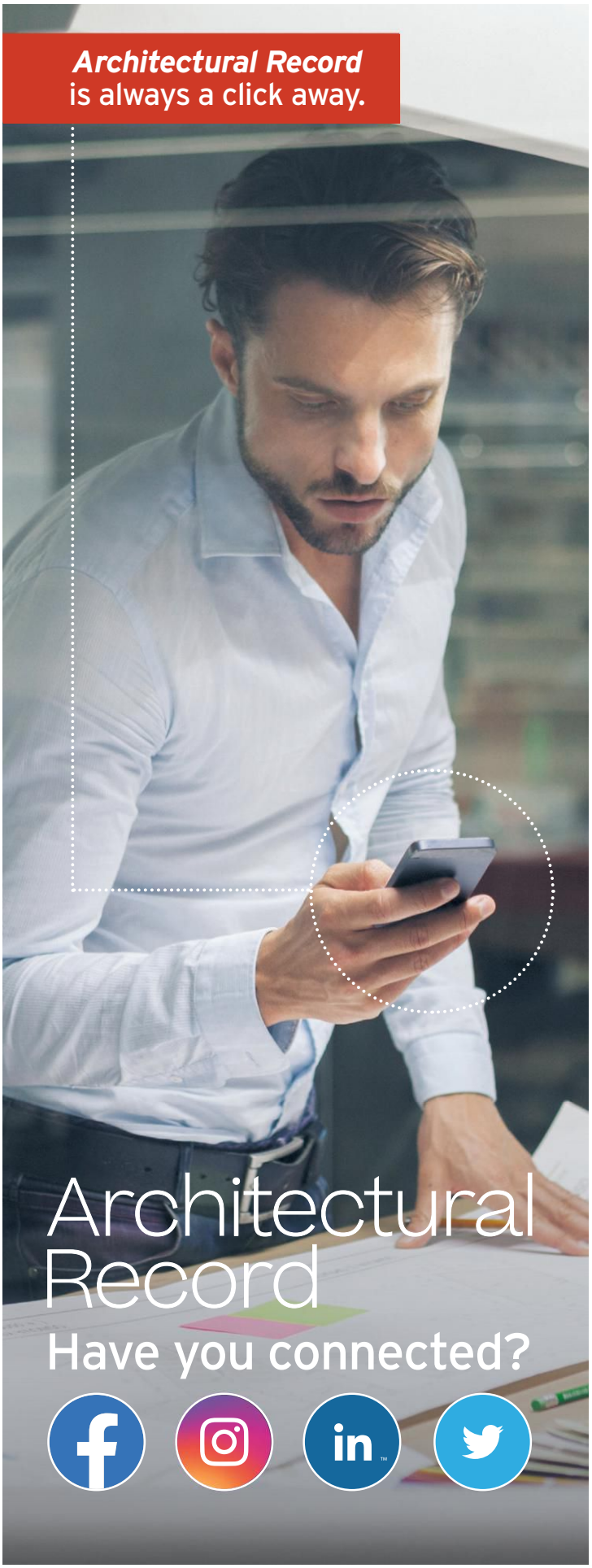
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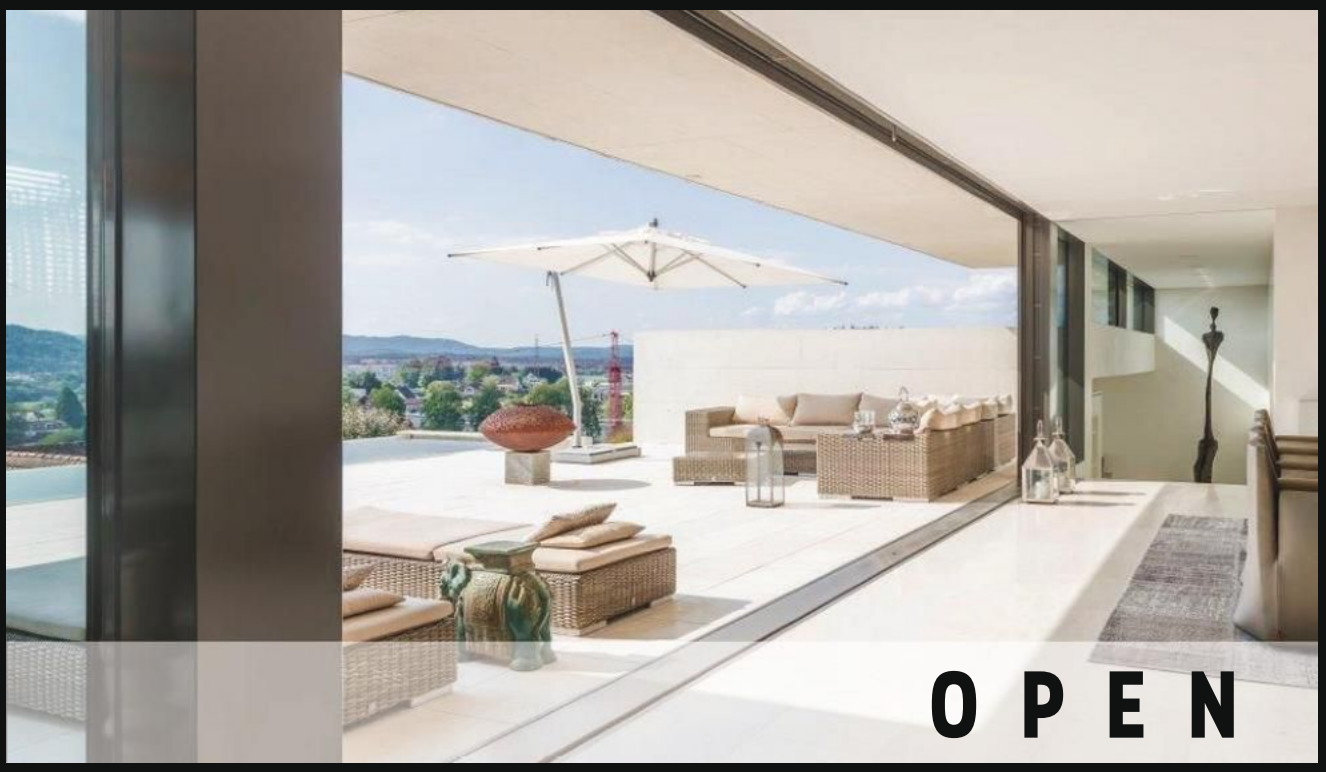
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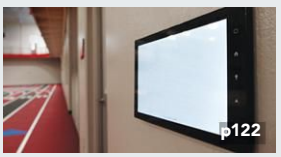


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Looking for a Place Called Home

Decent shelter is essential to human life and for our health and humanity.

IN APRIL 2020, in the annual Record Houses issue, this column discussed the challenges of home—the physical and psychological space where so many of us were in lockdown as the pandemic raged. It was at home that we were learning to isolate, to work and study remotely, to expand our use of digital tools, and to replace a sense of real community with a virtual one.

Now, 12 months later, we are beginning to exhale, with vaccine rollouts and businesses, schools, and other institutions starting to reopen—though in many places, as tentatively as the green shoots poking up in gardens and parks.

And, once again this year, we bring you Record Houses, a half dozen innovative responses to the idea of home, scattered around the world from Japan to Mexico, from Peru to New Zealand, and across America, from the Oregon coast to the East End of Long Island (page 57). Each of the architects who designed these houses, from the modest to the spectacular, thoughtfully considered the site, whether on a tight urban plot or along a rugged stretch of coastline exposed to the weather. And each took the opportunity to play not only with form but experiment with materials, from wood and weathering steel to thatch and cork.

But it is impossible to look at these beautiful explorations of design and not think of the other end of the spectrum in the experience of home—for those who are struggling to hang on to where they live, and those who have lost housing altogether. This is especially true with Covid: for millions of Americans, jobs have dried up and savings are gone. The federal moratorium on evictions is set to expire (governors have extended it in some states), though the $1.9 trillion Covid-19 relief bill includes $21.55 billion for emergency rental assistance and $5 billion in emergency-housing vouchers. Preventing evictions is a first priority for the new HUD secretary, former Ohio Congresswoman Marcia Fudge, as is tackling the affordable-housing crisis, ensuring fair housing practices, and grappling with homelessness.

According to HUD's annual one-night count, more than half a million people in the U.S. are homeless right now, and one-third are families with children (many experts believe the number is higher, neglecting to include those doubled up with relatives, for example). A disproportionate 40 percent are African-American. The relief bill does allocate $5 billion for homelessness, to help local governments on the front lines of this ongoing emergency—which should be a contradiction in terms but is not. Encampments of tents sprawl across vacant lots and parks, and under highway overpasses. Temporary shelter systems are inadequate or broken, with a revolving door of people in and out of homelessness, many of whose situations are complicated by mental health issues and substance dependency.

This lack of affordable or low-cost housing has been exacerbated, we know, by soaring property values in major metropolitan areas. There are small-scale solutions on offer, such as the Accessory Dwelling Units, or secondary residences, now permitted throughout California—a program that the City of Los Angeles has promoted by commissioning highly imaginative designs for such tiny houses from a roster of young architects (page 35). And the 2021 Pritzker Prize winners, the French architectural duo Lacaton & Vassal, should be a source of inspiration for working in this arena, with their ingenious transformations of existing buildings for social housing; the jury cited them for creating "architecture as strong in its forms as in its convictions" (page 23).

But we need much bigger, more sweeping ideas to upend the patchwork of programs that are now failing us. One intriguing concept comes from the Urban Democracy Lab at New York University, where professor Gianpaolo Baiocchi and H. Jacob Carlson, a post-doc researcher, have proposed a new federal agency, the Social Housing Development Authority, which would buy, at market value, distressed rental properties—often owned by small landlords—rehab them and turn them over to community housing nonprofits or tenant co-ops to rent and operate. Why is this such a fantastic idea? Because such properties are increasingly snapped up by private equity and corporate interests, which are far more likely to evict poor tenants than rehab the properties for them. Such an initiative could help create many more desperately needed low-rent houses and apartments.

For the chronically homeless, the answer also is to build, or rebuild, offering those in need not temporary shelter but permanent supportive housing. The homeless problem, unsolved by generations of well-intentioned bureaucrats, demands a strong, creative, system-wide approach. Expensive? Not compared to what we have. Experts agree it costs no more (and possibly less) to house the homeless than to pay for shelters, policing of nonviolent infractions on the street, and frequent emergency room visits (another symptom of homelessness). Formerly homeless people who are extended the dignity and basic right to live in a decent, safe, stable place are healthier and have better outcomes.

That shouldn't come as a surprise, because in the end, everyone needs a place to call home.

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Cathleen McGuigan

Cathleen McGuigan, Editor in Chief



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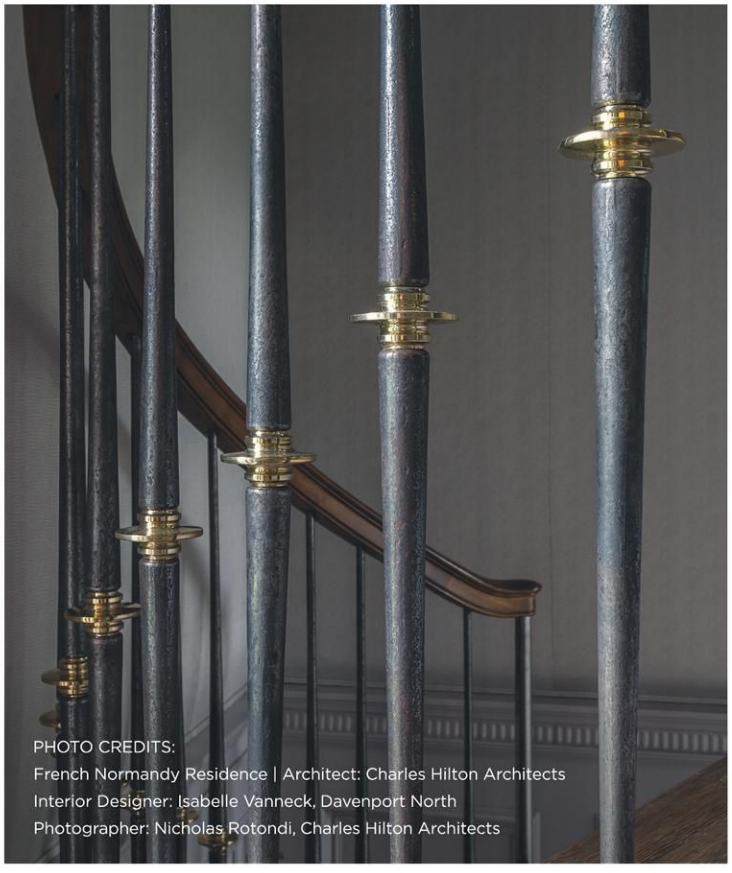


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The status quo depends on a backward concept, which is that architecture is expensive, luxurious, elite, and (pseudo) avant-garde—whereas I think architecture can be cheap, temporary, flexible.

—Architect V. Mitch McEwan,"How Can Blackness Construct America?", The New York Times, *March 11, 2021.*

The Pritzker Prize Honors French Architects Lacaton & Vassal

BY LAURA RASKIN

WHEN the French architect Jean Philippe-Vassal was practicing urban planning in Niger, West Africa, in the mid-1980s, he observed people with very few resources assembling and inventing architecture with the everyday objects and the materials at their disposal. His partner, Anne Lacaton, saw the same phenomenon when she would visit him. "We understood that everything was important. There was no reason to waste anything," said Vassal.

An ethos of looking to cities' existing building stock and readily accessible materials as a place to begin their designs, from social housing and cultural and academic institutions to urban schemes, is one of the reasons the Paris-based architects have been selected as the 2021 Pritzker Architecture Prize Laureates, the profession's highest honor.

In its citation, released March 16, the Pritzker jury wrote: "The modernist hopes and dreams to improve the lives of many are reinvigorated through their work that responds to the climatic and ecological emergencies of our time, as well as social urgencies, particularly in the realm of urban housing. They accomplish this through a powerful sense of space and materials that creates architecture as strong in its forms as in its convictions, as transparent in its aesthetic as in its ethics."

In a telephone interview from their office in Paris, Lacaton, 65, and Vassal, 67, said that the practice of architecture, which often tethers designers to their offices and computers, can distance them from reality. "There is only one real dimension—where you see and speak with people," said Vassal. "When you are in that dimension, urban planning and architecture are often very violent. The question of kindness and delicacy is, for us, essential: to take care of people in a very precise way. Architecture exists because life is inside. We try to give more freedom for people to be creative, to dream, because we think that quality of space is something important for each inhabitant." Lacaton agreed: "It is the point of architecture to make space for life, for living—not representation."

The idea of creating more space for comfort, even in a dense city, through lush winter gardens, balconies, and retractable facades,



has defined Lacaton & Vassal's projects since they began their practice in 1987. It's especially striking at La Tour Bois le Pêtre, a 17-story, 96-unit Paris housing project built in the 1960s that the pair transformed in 2011, garnering them international attention. Rather than raze the building, as the government wanted to do with much of its maligned midcentury social housing, the architects put their radical mantra to work: "Never demolish, never replace." They extended the footprint of the building by removing the facade and adding generous bioclimatic balconies, and each unit now has a flexible indoor-outdoor living space with views of the city.

The architects took a similar approach to the transformation of another city housing block in Bordeaux, in 2017. With architects Frédéric Druot and Christophe Hutin, Vassal and Lacaton expanded all 530 units of Grand Parc without displacing residents and for half of the cost of building new, winning the team the European Union Prize for Contemporary Architecture in 2019.

Lacaton and Vassal met in the late 1970s at École Nationale Supérieure d'Architecture et de Paysage de Bordeaux and were drawn to each other's sensibilities. "We worked well together, and we decided to continue," said Lacaton. She went on to pursue a masters in



Lacaton, at left in photo (right) and Vassal transformed low-income housing in Saint-Nazaire, France, in 2011 (above).

Urban Planning from Bordeaux Montaigne University while Vassal went to Niger. The Moroccan-born Vassal said his childhood in Casablanca influenced his chosen profession, with its modernist buildings oriented toward the ocean and its legacy of craftsmanship. His father, a meteorologist, attuned him to the climate, indoors and out.

Creating a porousness that allows a building's inhabitants to easily access the outdoors has been a constant in Vassal and Lacaton's work, beginning with their early private houses. The small budget Latapie House of 1993, in Floriac, France, employs natural ventilation and solar shading. Using wood, polycarbonate sheeting, and opaque fiber-cement boards, the architects created operable layers of openness and refuge.

This doubling of usable space can be seen quite literally in the pair's FRAC Nord-Pas

PHOTOGRAPHY: COURTESY PHILIPPE RUAULT (TOP); LAURENT CHALET (BOTTOM)



Lacaton & Vassal preserved a shipbuilding structure and designed its twin for the FRAC Nord-Pas de Calais.

PHOTOGRAPHY: COURTESY PHILIPPE RUAULT

de Calais, a contemporary art museum in Dunkerque, France. There, the architects preserved a pre–World War II shipbuilding facility on the waterfront and built a twin structure adjacent to it with transparent, prefabricated materials. Visitors can see through the new into the old structure, which now provides space for public programming.

Grouped together, Lacaton & Vassal's projects might seem to have a similar palette and modest materiality, but Lacaton insists that their designs begin with the "conditions of living, of feeling, of living together," and that the choice of materials is a direct response to the desire to create a building envelope that is light and responsive to the seasons. "Transparency is important, but transparency can be nuanced and filtered with glass or polycarbonate," said Lacaton. "The notion of escape is important." Vassal agreed, adding that their goal is to free architecture from its role as defender against the environment. Instead, architecture should function more "like clothing" by protecting in more layered, nuanced ways.

When they create new buildings, as they did for an architecture school in Nantes, France, Vassal and Lacaton use this same idea of a skeletal system with "platforms and envelopes" to create adaptable, flexible spaces. Located on the Loire River, the École Nationale Supérieure d'Architecture de Nantes is a three-story building featuring a concrete and steel frame encased in retractable polycarbonate walls and sliding doors. A wide ramp that runs from the ground to the roof deck is meant for spontaneous gatherings.

Vassal & Lacaton's office of eight is currently transforming a former hospital into a 138-unit apartment building in Paris and is designing an 80-unit building in Anderlecht, Belgium, among others. The architects said they were celebrating their win with wine from Bordeaux (of course) and looking forward to seeing friends and colleagues when Covid-19 eases. Vassal said he wanted to use their platform to amplify the voices of young architects. "We have to believe in their dreams and their ability to improve the quality of life for everyone. Most of the time we don't ask them, and most of the time, we should ask them much more." ■



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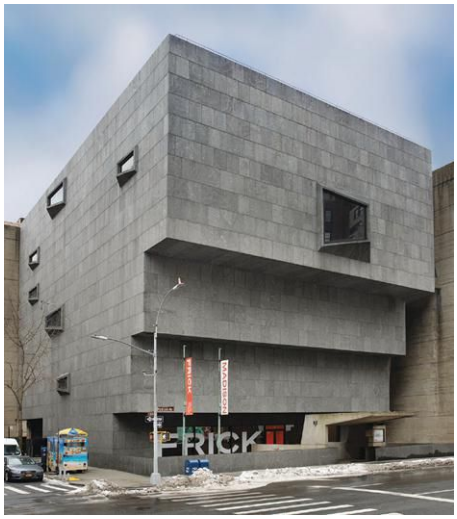
Frick Collection Brings a New Look to the Breuer Building

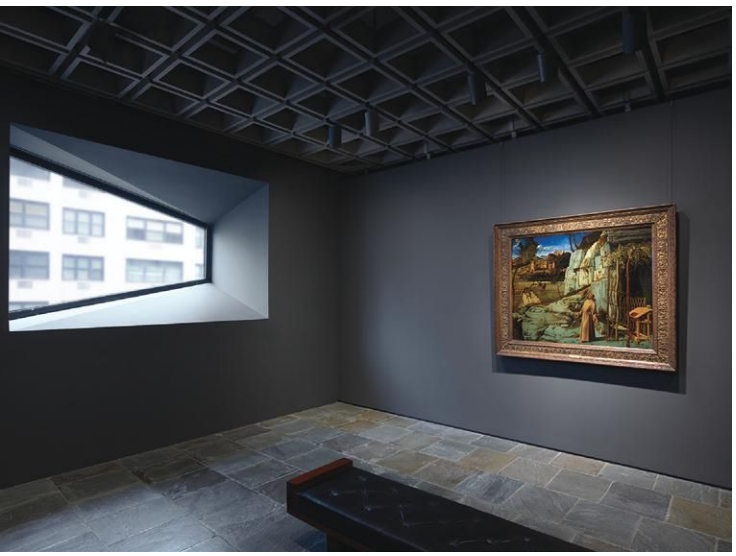
BY LAURA RASKIN

ON MARCH 18, the Frick Collection opened the doors to its temporary home in Marcel Breuer's Modernist ziggurat museum on Madison Avenue in New York. It will be the first time that a significant portion of the institution's holdings of old master paintings, Renaissance sculptures, and European decorative arts will be exhibited outside the walls of its Upper East Side mansion.

The move is precipitated by architect Annabelle Selldorf's renovation and expansion of the Frick's original home, built in 1914 by Carrère & Hastings for the industrialist Henry Clay Frick. Over the next several years, much of the 1,500-piece collection will be placed in storage in the confines of the Breuer structure, while roughly 300 of the Frick's works of art are displayed on three floors of its galleries. Selldorf, the founding principal of Selldorf Architects, has been in charge of the installation, along with Frick curatorial staff, led by Xavier F. Salomon, and its longtime exhibition designer Stephen Saitas.

The Breuer building, which originally housed the Whitney Museum of American Art and opened in 1966, was leased by the Metropolitan Museum of Art for the last five years, and became known as the Met Breuer. Now named the Frick Madison, the Brutalist architecture houses the collection's highlights, organized geographically and chronologically. A series of gray-walled galleries, designed by Selldorf and the team, propel guests counterclockwise, while floor-to-ceiling openings and cross-vistas tease new connections between works of art that have been shown in a dense residential setting since the Frick opened this collection to the public in 1935. On the second floor, for example, three 16th- and 17th-century Dutch master portraits, though in three different galleries, can be observed simultaneously, as if a Hobbema, Rembrandt, and Van Dyke are successively taking one's hand.





Marcel Breuer's 1966 Modernist masterpiece, originally designed for the Whitney Museum of American Art (above). Bellini's St. Francis in the Desert (bottom).

The third floor is dedicated to works from Spain and Italy, while the double-height fourth floor features British and French paintings. Each level opens with a significant sculpture, or several pieces, such as the three rare Italian marble busts that greet visitors on the third floor. By Francesco Laurana and Andrea del Verrocchio, they date to the 1470s. The curators strayed from the exhibition's organizational logic in some places so that certain objets d'art and furnishings could be seen in isolation. These include fragile 17th-century Indian carpets, bronzes, tiered shelves of porcelain lined up like sumptuous lacquered candies, and exquisite clocks.

The architect and curatorial team chose the art first, and then decided on the armature to contain it, said Salomon on a recent tour. They hung paintings sparsely, one or two to a wall, allowing guests to have the space and time to contemplate details and for each piece to luxuriate in its narrative. Saitas placed panels behind some smaller works to help better anchor them against the wall planes. Larger canvases, hung higher at the original Frick, are inches from Breuer's wood or stone floors, creating the illusion of entering the scenes.

There are no barriers or lines to keep visitors from getting almost as close as they want to the art, and very few vitrines, maintaining the accessible atmosphere that could be found at the Frick mansion. Adding to the drama, Selldorf's thick gray walls, free of titles or texts, make the transition between rooms more noticeable. Instead, guests can access on their own phones a free curator-led mobile guide on the Bloomberg Connects App.

The Met leased the Breuer building in 2015 to expand its Modern- and contemporary-art presence, and preservation architects at Beyer Blinder Belle carefully and surgically restored and cleaned the interior; the building is not landmarked but is protected by its inclusion in the Upper East Side Historic District. When the Met presented its 2016 exhibition *Unfinished*, which began with Renaissance masters, it was the first time the Midcentury Modern, granite-clad Breuer had played backdrop for non-Modern works, and it provided a hint of just how good the contrast could be.

For more inspiration, the Frick's curatorial team traveled to Louis Kahn's Kimbell Art Museum in Fort Worth, Texas, of 1972; the 1970 Brutalist addition to the 1694 Besançon Museum of Fine Arts and Archeology in France; Donald Judd's foundation in Marfa, Texas; and the Calouste Gulbenkian Museum in Lisbon of 1969. The tour gave the curators clues about how to achieve a balance between the architecture and the art, as did Selldorf's extensive experience with installations and exhibitions.

"I was happy that the curatorial team all understood that this was a sort of restrained circumstance, as opposed to minimal—that's not what the issue is," said Selldorf in a phone interview. "My strongest sentiment is that, with this installation, we proved that the Breuer is

PHOTOGRAPHY: © JOE COSCIA



In a second-floor gallery, Rembrandt's *Nicolaes Ruts* (1631) faces the much later *Self-Portrait* (1658).

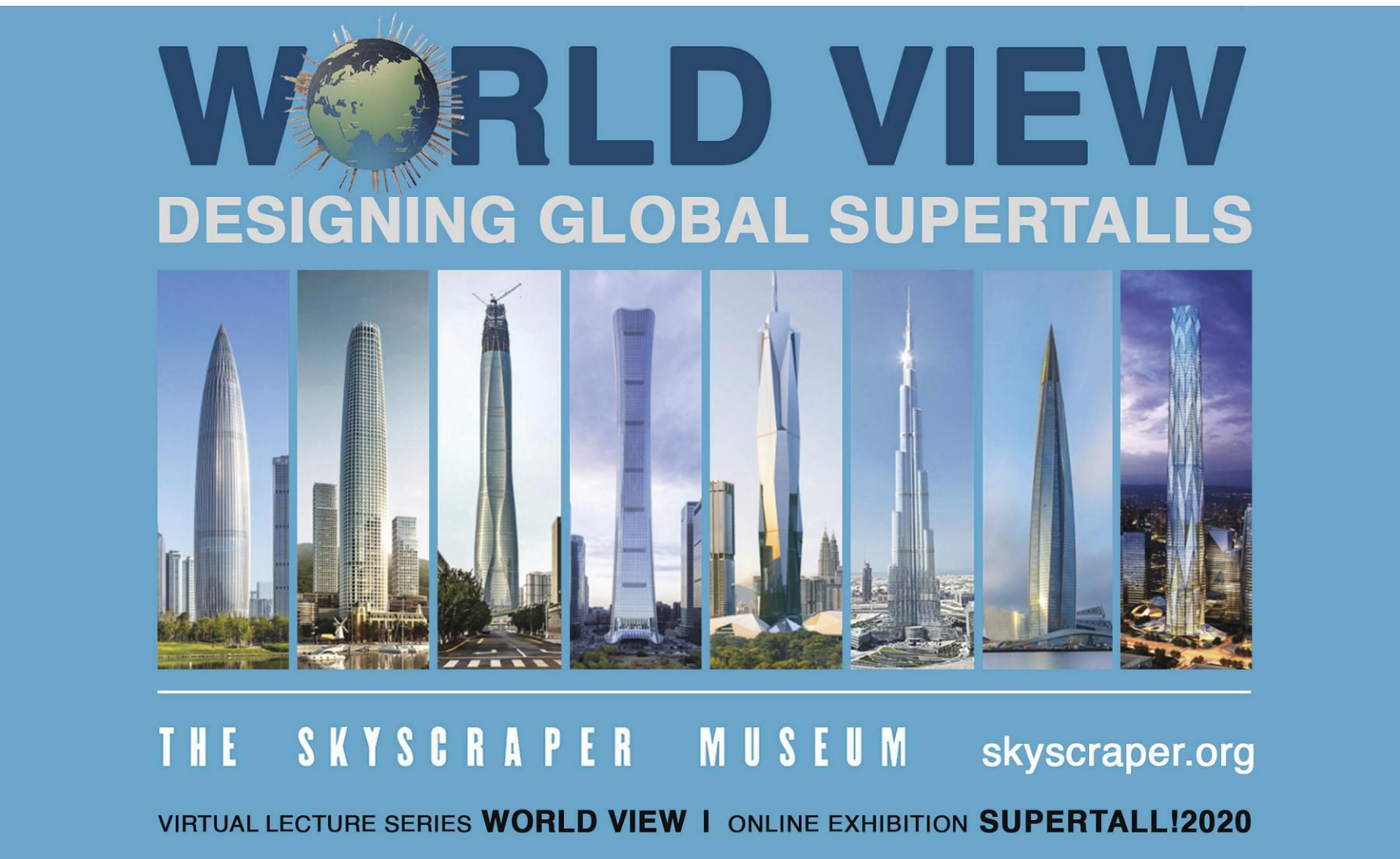
just a fantastic building and it can be a companion to this incredible old master painting collection. It was designed in a rigorous fashion and allowed us to lay out the spaces to both respect the architecture and foreground the art."

Selldorf described the collaboration with the Frick curators as a highlight of the last year, and one marked by a complementary fluency with each other's expertise. The only point at which their opinion seems to have differed was on paint color. Salomon is adamant that old masters "look terrible" on white walls; Selldorf laughs and says she "begs to differ." "I have a beautiful 17th-century Dutch master on a white wall that receives north light, and it's absolutely spectacular." They quickly came to an agreement, however, on a palette of grays that would punctuate the paintings.

The team paid special attention to Breuer's trapezoidal windows. On the third and fourth floors, they are paired with his original Whitney benches and some of the Frick's most beloved pieces. Giovanni Bellini's *St. Francis in the Desert* from the 1470's hangs in isolation adjacent to a window, natural light merging with manmade.

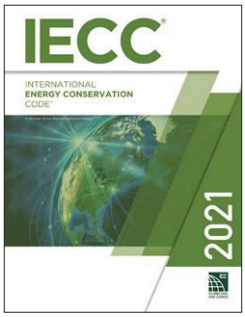
The denouement of the exhibition is two fourth floor rooms containing all 14 of Fragonard's Progress of Love canvases. Four were painted from 1771–72 for Madame du Barry, the last mistress of King Louis XV. For unknown reasons, she rejected the canvases and Fragonard stored them in his studio for the next 20 years, at which point he completed the scheme with 10 more. At the original Frick, they were displayed out of chronological order, but at the Frick Madison they are shown in the sequence in which Fragonard painted them. Opportunity, rather than compromise, was Selldorf's guiding principle. "We weren't looking to create domestic settings but rather showcase the artwork," she said. "I'm a great believer that art relates to the circumstance in which it is perceived, but also stands on its own two feet."

The Frick Madison is opening after a year of painful lapses in live cultural experiences, and with people aching to travel—literally and figuratively—beyond their own walls. The Frick's own voyage to a new setting will bring it fresh and expanded views. ■



ICC Makes Controversial Change

BY JOANN GONCHAR, FAIA



EARLY in March, the board of directors of the International Code Council (ICC) moved to overhaul the process for developing its model energy code. The controversial change entails switching from a framework in which thousands of ICC members, who are government officials, voted on code updates to one that puts the power largely in the hands of committees appointed by the ICC board, with representatives from trade groups and other interests. The shift has been widely criticized by efficiency proponents who worry it will give too much say to those with a financial stake in the outcome, compromising the code's effectiveness as a tool for reducing greenhouse-gas emissions.

The decision comes in the wake of the finalization of the 2021 International Energy Conservation Code (IECC). Published in December, it is the code's most energy-efficient edition. Buildings constructed according to the 2021 IECC would be between 8 and 14 percent more efficient than the previous version, published in 2018. Environmental advocates say the latest code is the product of deep engagement by ICC members—officials working for building departments or those connected to public health and safety—pointing to the large number of votes cast. Many of the 2021 IECC's key efficiency provisions received more than 1,000 votes in favor, says Amy Boyce, associate director of codes and technical strategy at the Institute for Market Transformation, which promotes high-performance buildings. In previous code cycles, proposals typically received between 200 and 300 votes, total.

In response to the unprecedented participation of so many members, some industry groups, mainly those representing builders and natural-gas utilities, called the results into question. They lodged appeals, seeking the removal of more than 20 energy-saving provisions. They were ultimately successful in quashing a handful relating to wiring that would make buildings electric-ready. The groups, which included the National Association of Home Builders (NAHB), maintain that such features can increase the cost of construction, threatening affordability. The organization has praised the new framework. "This is an important change that we expect to result in a model energy code that meets the needs of consumers, builders, building officials and energy-efficiency advocates," said NAHB Chairman Chuck Fowke, in a statement.

Groups like NAHB will have more influence in the future. The new development committees will encompass interest categories that include manufacturers, builders, the insurance industry, and consumers, with only one-third of the seats reserved for government regulators.

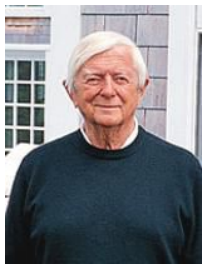
Ryan Colker, an ICC vice president, argues that the new framework will accelerate code adoption, noting that some jurisdictions are still using the 2009 edition. IMT's Boyce is skeptical. "The process that resulted in the 2021 IECC involved the highest number of governmental officials to date. Removing their say would likely undermine their willingness to advocate for the latest version," she says.

Overall, sustainability proponents are perplexed by the need for a new process, especially since the latest development cycle delivered significant efficiency improvements. This past winter, the proposed framework drew comments from more than 200 individuals and organizations. According to IMT, more than 75 percent of these were in opposition to the change, with the National League of Cities, the U.S. Conference of Mayors, and the National Association of State Energy Officials expressing their disapproval.

The AIA has also been sharply critical. "We are deeply disappointed to see the ICC move forward with this change, which we believe will present a step backwards for climate action," said a statement from Robert Ivy, the AIA EVP/chief executive officer.

Despite the ICC's seemingly regressive move, champions of continued code improvement say that cities and states with ambitious climate goals have options. Jim Edelson, director of policy for the nonprofit New Buildings Institute (NBI), points to the Building Decarbonization Code that his organization developed with the Natural Resources Defense Council as a more rigorous overlay to base codes. "We see a lot of interest in alternatives to the IECC if it does not produce the desired outcomes." ■

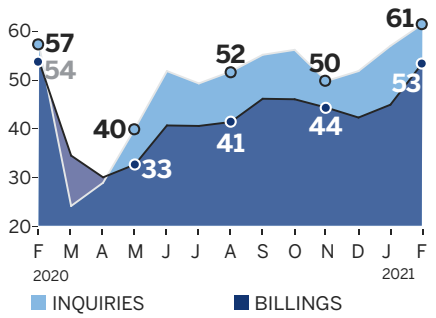
Hugh Newell Jacobson Dies at 91



Renowned residential architect Hugh Newell Jacobsen died on March 4 at the age of 91. Based in Washington, D.C., Jacobsen also worked on university and cultural projects, including the renovation of the Renwick Gallery and the Arts and Industries Building of the Smithsonian. His slightly surreal style found a middle ground between the Modernism of his mentor, Louis Kahn, and the older architecture he admired. His residential clients included Jacqueline Kennedy Onassis, for whom he designed a compound on Martha's Vineyard; philanthropist Rachel "Bunny" Mellon; King Hussein and Queen Noor of Jordan; and Meryl Streep. Visit architecturalrecord.com for our full-length obituary.

"Classical Architecture" Order Overturned

On February 24, President Biden ordered the revocation of the Executive Order, "Promoting Beautiful Federal Civic Architecture," signed by former president Trump on December 18, 2020. The Trump order, mandating the preference for "traditional and classical architecture" in the design of new Federal buildings, prompted objections across the architectural community against prescribing any official style for government buildings.



ABI

The American Institute of Architects reports that the February Architecture Billings Index (ABI) score was 53.3, up from 44.9 in January. February's score marks the first time in a year that the index has exceeded 50, marking an increase in billings.

PHOTOGRAPHY: © INTERNATIONAL CODE COUNCIL (LEFT); RYANRMINER1585/WIKIMEDIA COMMONS (RIGHT)



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The Legacy of Racism in the Making of Cities and Communities

Reconstructions: Architecture and Blackness, at MoMA, interrogates the past while imagining a liberated future.

BY ALICIA OLUSHOLA AJAYI

THE HIGHLY ANTICIPATED exhibition at the Museum of Modern Art in New York, *Reconstructions: Architecture and Blackness in America*, takes its name from the historic two decades that followed the bloody Civil War. Yet, despite the reference, the show (through May 31) isn't a call to a return—the aim is to reflect on the legacy of a country attempting to redefine itself. While the works commissioned from 10 prominent architects, landscape architects, designers, and artists place a critical lens on systems of racial oppression, "the premise is not to press for solution-based designs," according to the cocurators, Mabel O. Wilson, professor of architecture and Black studies at Columbia University, and Sean Anderson of MoMA. Instead, the process of interrogating the past and the present, as a way to insist on liberating futures for Black lives, gives a new understanding of what architecture can actually do.

The opening of *Reconstructions* has come on the heels of a year we can't wait to put behind us. Still, the show's challenge is not to take its timeliness for granted. The contributors' work confronts the very structure of the design field and offers insight into the often-overlooked motivations of many BIPOC architects who have actively fought against the profession's ambivalence toward engaging social issues, especially those relating to race. Though using such conventions as plan, elevation, and section—as well as video, collage, and sculpture—the designers foreground new ways of making. In all of the work on view (and in the accompanying catalogue, which serves as a "field guide"), the tension between time and Blackness serves as a baseline for spatial speculations, rooted in the history of 10 American towns, cities, and communities, each of which is explored by one of the contributors.

Formed as the Black Reconstruction Collective (BRC), they include Emanuel Admassu, Germane Barnes, Sekou Cooke, J. Yolande Daniels, Felecia Davis, Mario Gooden, Walter Hood, Olalekan Jeyifous, V. Mitch McEwen, and Amanda Williams. A video installation by David Hartt is also included. While the subjectivity of each individual is as varied as the shades of black (expressed in Williams's recent project *What Black Is This You Say?*), the collective's manifesting statement deviates from the objectivity of the vested architecture canon, conjuring a new directive:

The Black Reconstruction Collective commits itself to continuing this work of reconstruction in Black America and these United States. We take up the question of what architecture can be—not a tool for imperialism and subjugation, not a means for aggrandizing the self, but a vehicle for liberation and joy.

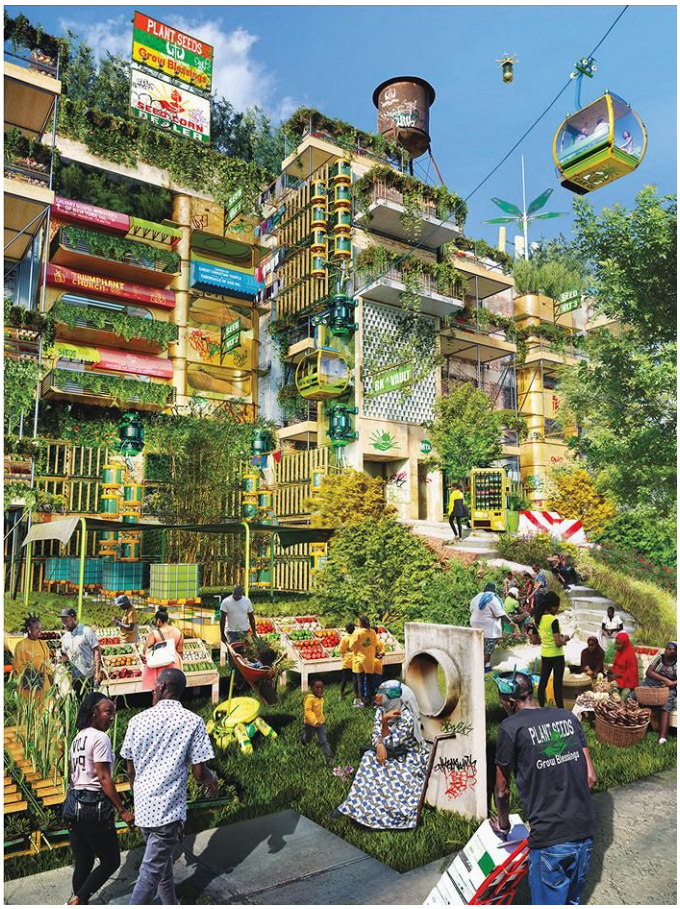


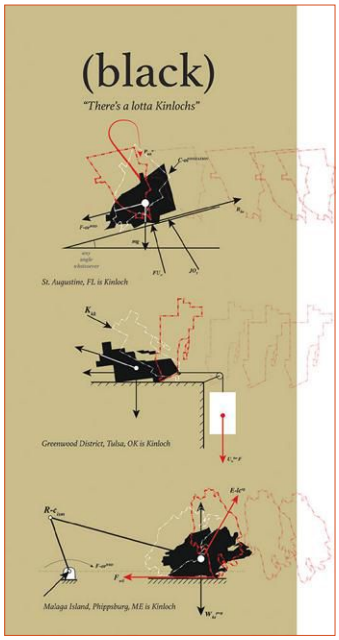




Works include Felecia Davis's hovering soundscape (top), Mario Gooden's *The Refusal of Space* (above), and Germane Barnes's installation on Miami, in which one part (left) notes that Black people served tourism but could not live near the beach.

The manifesto, in bold black letters on a 10-foot by 10-foot hanging canvas, covers the namesake of MoMA's architecture gallery, the department's founder and a respected architect who was also a well-known fascist. The statement itself may read as a new call to action, but, for many, the call draws its strength from the continuation of the labors, desires, and catalytic ideas of those who came before. The generations of calloused hands





Olalekan Jeyifous envisions future mobility in Brooklyn (left), while Amanda Williams explores, in varied media, historic Kinloch, Missouri (above).

PHOTOGRAPHY: © ROBERT GERHARDT (OPPOSITE, TOP AND BOTTOM, RIGHT); COURTESY THE ARTIST (OPPOSITE, BOTTOM LEFT AND THIS PAGE, BOTH RIGHT)

that built this country understand the work has never ceased, and the statement rallies behind those who have done the construction and will continue to build.

Inside the gallery, rebellious spirits work at multiple scales. Mario Gooden's *The Refusal of Space* is a "protest machine," reconfigured from a Nashville streetcar, made of black-painted aluminum and wood. Adorned with a blackened Confederate flag, and using photography, video, and sound, the structure reimagines the occupation of segregated space by Nashville student protestors in the 1960s. As Pittsburgh's Hill District currently prepares for an upending development in the near future, Felicia Davis's hanging soundscape sculpture allows a reciprocity between the body and the environment, to suggest a practice of collaboration and co-construction with the community. The Black Panthers' Ten-Point-Program from 1967 is the source for Walter Hood's invention of 10 towers—materialized as black, human-scaled models—to regenerate an Oakland, California, neighborhood neglected by systemic disinvestment. Amanda Williams confronts the intersection of legal ownership, property, and Black spaces in Kinloch, the first historically Black town established in Missouri, by showcasing a letter-sized patent, along with maps and video, for "a method for navigating to free Black Space" from the U.S. Patent and Trademark Office.

An investigation of material staples in the Black community, such as hot sauce and the beauty-salon basin, makes its way into Germane Barnes's suspended exploded axon of a kitchen—a key Black space in Miami's diverse Black landscapes. Mitch V. McEwen incorporates video of Black women dancing and delivering architectural fantasies for the city of New Orleans. McEwen's piece, inspired by artist Kristina Kay Robinson's *Republica: Temple of Color and Sound*, hinges on the counterfactual and ponders what the city might have looked like as a Black nation-state if an enslaved uprising had succeeded. (Mid-video, the feed is abruptly interrupted to give a "Warning Advertisement" of the danger of being in the white space of MoMA.) J. Yolande Daniels's *black city* creates a glossary to recount the contributions of African-Americans to the founding of Los Angeles. One such figure is Bridget "Biddy" Mason, a formerly enslaved woman who used the spatial tactics of buying properties to aid her in her philanthropic work. A new series of Olalekan Jeyifous's speculative-futures visuals repurposes the existing, troubled Metropolitan Transit Authority as the Main Threshold Access, to better serve Black Brooklyn's mobility. Finally, with all the style and grace of a DJ, Sekou Cooke uses elements of hip-hop to remix the tragic history of displacement of Black residents in Syracuse, New York, with a new proposal for place-keeping tactics in public spaces.

The work is complex, exhaustive, and inspiring. The gallery is overwhelmed by unknown history, enlivened with each piece; the installation is visually commanding and rigorous, stretching back to the past while illuminating possible futures.

In trying to peel back the layers of Blackness and architecture, the show challenges the blinded perception of the discipline as innately progressive, as the field continues to falter under the weight of structural racism. The profession's lack of reflection is heightened by the country's obsession with what was and what is to come, while obscuring whatever present realities engulf us. Blackness often falls victim to this cycle of memory and time. The temporality of the white gaze on the Black experience comes and goes, rising at the breaking points of pain for Black and Brown folks. The most recent cycle of the gaze—due to the renewed momentum of the Black Lives Matter movement—has been more demanding of our attention. Expressed empathy becomes interchangeable with taking action, making claims that *Reconstructions* is a *timely* endeavor. However, the voices showcased in the exhibition declare that *Reconstructions* was inevitable because the work for Black freedom was never prioritized—so the task never ceased. This poignant and needed work is not only a living archive but a celebration of the continued fortitude in bringing consciousness to the profession. By engaging the labor of resistance against the oppressive systems within the field, the show demands that architecture take an active part in remaking American society. *Reconstructions* and the BRC collective, which plans to continue its efforts beyond this moment, is not a new wave of architectural thought; it is the field and MoMA that are just now catching up. ■

Alicia Olushola Ajayi, who holds masters degrees in architecture, social work, and criticism, is engaged in research on antebellum Black settlements.



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Tiny Houses in the Big City

Los Angeles unveils inventive designs for Accessory Dwelling Units to address the affordable-housing crisis.

BY SARAH AMELAR

THE ACT of tucking an ancillary living unit—such as a backyard cottage, granny flat, in-law suite, guest bungalow, income apartment, or converted garage—onto the same site as a single-family house isn't always welcome, or even legal, in many communities across the U.S. But there's a growing trend to green-light "accessory dwelling units," or ADUs. Most progressively, California passed legislation in 2017 to legalize these modest, self-sufficient dwellings throughout the state—prompted, in large part, by a chronic housing crisis and shortage of affordable options. Promoting diversity in scale and income levels, ADUs also advance the environmental benefits of "living small" and creating denser communities. The legal version of this building type has "already become immensely popular here," says Christopher Hawthorne, chief design officer for the city of Los Angeles, where, in the past three years, ADUs accounted for 22 percent of new permits for housing units. To ease the process, municipalities across the state, including L.A., have partially relaxed such requirements as parking and setbacks while developing programs with incentives to make more ADUs available to low- or moderate-income tenants. Now Los Angeles is taking steps to further streamline the permitting process, while capitalizing on the city's culture of innovative and eclectic house design. Last month, the L.A. Department of Building Safety (LADBS), in partnership with the mayor's office, launched its ADU Standard Plan Program, offering homeowners the option of choosing from an online catalogue of fully vetted designs, reducing the permitting time to as little as a single day.



ADU prototype by SO – IL.

Leading up to this announcement, the city engaged 14 firms—primarily local and emerging talent—in a six-month, behind-the-scenes pilot phase, designed to smooth out kinks in the review process and user interface. In selecting the participants, says Hawthorne, "we wanted a mixture of firms, including some that had already done ADUs—a group mostly from L.A., but with some outsiders, as the city has always been open to design input from elsewhere." At the time of the launch, schemes from nine participants (some of whom produced more than one) were ready to roll. They came from the L.A. practices of Welcome Projects; First Office; Fung + Blatt; Taalman Architecture; Escher GuneWardena Architecture; and Design, Bitches; plus Massachusetts-based Jennifer Bonner/MALL; and two modular-prefab companies, Abodu, from Northern California, and Connect Homes, from L.A. Still pending approval is work from five additional designers: the local firms of wHY Architecture; Amunátegui Valdés (based also in Chile); and LA Más, a grassroots, community- and policy-focused nonprofit; as well as SO – IL and Sekou Cooke Studio, both from New York state.

Beyond this initial group, Hawthorne emphasizes, the program is now "open to any and all architects, contractors, and other firms that meet the basic requirements." In developing L.A.'s ADU standard-plan option—akin to LADBS's existing pre-approved offerings for swimming pools and stairs—the city's team looked closely at prescreened accessory-dwelling initiatives in





Inside and out by Jennifer Bonner/MALL.

IMAGES: COURTESY CITY OF LOS ANGELES

place elsewhere, including Seattle and the California cities of San Jose, San Diego, and Santa Cruz. While some municipalities own the approved plans and license them for use, Los Angeles is not adopting that approach, at least not initially. Instead, homeowners will work directly with the architects on any financial arrangements. And rather than offer a handful of fairly generic choices, L.A. is opening the floodgates to a wide variety of designs, some quite inventive, quirky, or playful—qualities previously achieved here (at least legally) only with custom-designed ADUs, permitted through the more demanding conventional process.

Though ADUs fall into several categories (detached, attached, inside the main house, and junior-sized, or JADUs), this program applies only to freestanding structures, each no more than 1,200 square feet, rising one or two stories, and sited on relatively flat parcels (without protected-land or historic-overlay restrictions). Homeowners will have leeway to modify some aspects of the schemes, such as color and certain finishes.

"I was surprised and pleased by the variety of approaches, given the challenge of designing into a void, without a site or client, and with stringent constraints, like seismic and energy codes," says Hawthorne. "The proposals went beyond the basic need to be standardized, buildable, livable, and flexible—hitting that sweet spot between practicality and expressive character." In many cases, that personality, even whimsy, plays with the vernacular of Southern California—through riffs on Spanish-Colonial style (as in the work of Welcome Projects), or allusions to the Modernist stuccoed box (as in proposals by Jennifer Bonner/MALL and Fung + Blatt), or through a distillation of rational Minimalism (as in the modular prefabricated metal-clad forms of Taalman Architecture). Some of the designs evoke the fanciful lightness of garden pavilions, notably SO – IL's luminous cylindrical structure, with its petal-shaped plan forming a single reconfigurable room around a wet (kitchen-bathroom) core. Even without specific sites, several of the ADUs carve out private outdoor realms, including two with roof decks—one by Jennifer Bonner/MALL and the other by Amunátegui Valdés—and a serene side-court by Fung + Blatt. The 28 approved or pending schemes range from studios to two-bedroom units, with many, but not all, using single-story, stick-frame construction for ease of approval. That said, a few less traditional fabrication methods are also in the mix, including the 3-D-printed building envelope—to be shipped as flat-packed panels and assembled on-site—that La-Más plans to integrate into its backyard casitas.

Hawthorne sees the Standard Plan Program as benefiting not just ADU owners and renters, but also providing a potential lifeline for young architects and small offices in lean times. Even in the midst of the pandemic and economic upheaval, he points out, the number of ADU applications in Los Angeles remained steady in 2020. A key goal for this program, in a later phase, will be to dovetail with the municipality's other ADU initiatives, such as the L.A. Accelerator, which offers subsidies and support to homeowners in exchange for commitments to rent the units at affordable rates to seniors. With 70 percent of residentially zoned land in the city of Los Angeles reserved for single-family homes, says Hawthorne, ADUs could make a significant contribution to the housing stock, "enriching it, expanding its diversity, and potentially opening the way to house more Angeleños." ■



ADU by wHY Architecture



By Design, Bitches



By Taalman Architecture

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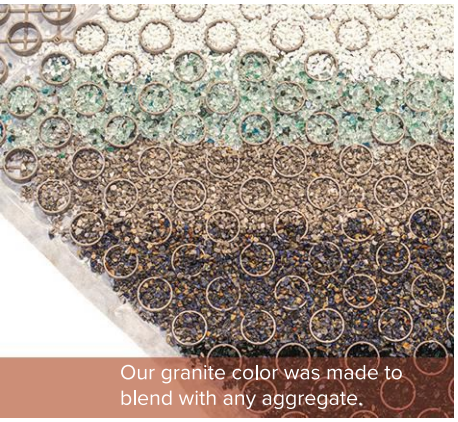
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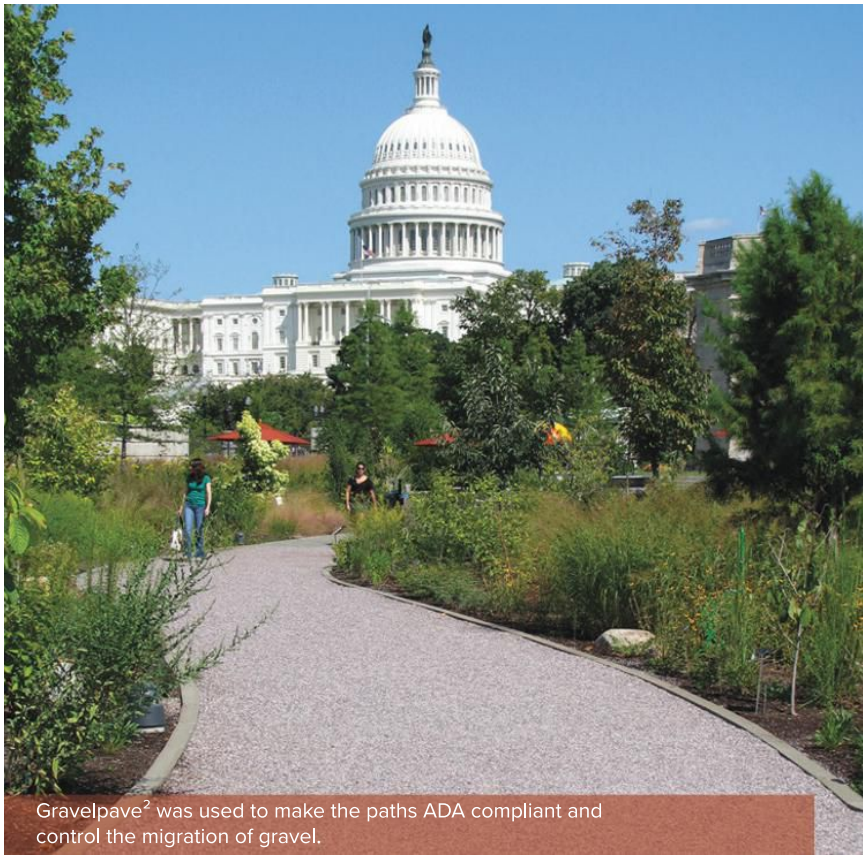
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LANDSCAPE

DIETMAR FEICHTINGER EMBEDS A SERPENTINE WALKWAY ALONG THE ROCKY SHORELINE IN CORSICA. **BY KARA MAVROS**



"BASTIA has a difficult relationship to the sea," muses architect Dietmar Feichtinger. This medieval city, tucked away on the mountainous French Mediterranean island of Corsica, sits well above sea level, making up-close encounters with the water uncommon. Along the rugged northeastern coastline here, Feichtinger has recently completed Aldilonda, a 1,500-foot-long walkway hugging the craggy cliffside, between a 14th-century citadel and the waves below.

The city of Bastia chose Feichtinger's eponymous Paris-based firm in a 2017 competition—along with IN SITU landscape architects and local firm Buzzo Spinelli—to create a scenic footpath linking the city center at the island's northern end with the touristy, densely populated southern end, in order to bring people together who have historically been segregated at either end of the island. This newly blended social scene, he acknowledges, is even more important since the isolation of the pandemic.

At 10 feet wide, the concrete Aldilonda pedestrian route is like an elegant, sinuous balcony that follows the natural curves of the cliffs. The path is constructed without traditional piles for withstanding the force of the sea. Instead, it is cantilevered from the rocks with concrete and steel anchors. (Debris that was removed in making this structure was mixed into the concrete, so it would match the texture and color of the rock face.)

In a tale as old as time, Feichtinger found it easier to work with nature than against it. "The rock doesn't always do what we want," he says. Along the route, some of the natural alcoves were too jagged for concrete paving to fill, so the team widened the walkway on these segments with steel grates, which occasionally allow water to splash through when the sea is rough.



The walkway is built into the northeastern coast of Corsica, below a historic defense wall that dates back to the 14th century.

The architects chose to keep the path at a consistent height of 16 feet above sea level (and give a 4 percent grade for ease of accessibility), making the intervention relatively low, out of respect for the historic bastion above. Lining the walkway, a minimal weathering-steel rail, with narrow balusters, allows for nearly unobstructed water views.

Since opening in December 2020, Aldilonda has become a popular destination for Corsicans, a novel outdoor activity for escaping the home during Covid. The experience of standing on the platform over the water, Feichtinger says, is almost like a fireworks show, with families and excited kids waiting in awe for the next big wave to crash underneath them. ■

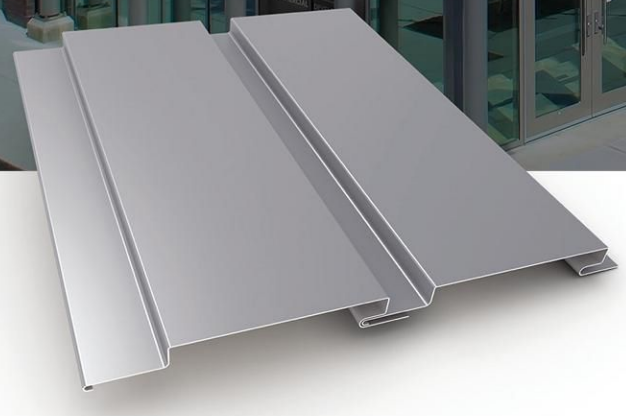
PHOTOGRAPHY: © DAVID BOREAU (TOP); ARIAVISTA (RIGHT)

Rhythm + Character



"The contrast between the metal bays and traditional brick walls gives the project its rhythm and character."

-Andreas Lange, AIA, senior associate, Perfido Weiskopf Wagstaff + Goettel



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The architect of Walhalla, near Regensberg, Germany, was **Leo von Klenze** (1784–1864), who designed the memorial in homage to the Parthenon. The temple-like structure, commissioned by Ludwig the Great of Bavaria and opened in 1842, honors German scientists, philosophers, artists, and politicians. Along with the Pinakothek and Glyptothek in Munich, Walhalla established von Klenze's reputation as a key architect of the country's Neoclassical style.

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Domestic Dispute: Two Architects Debate the House

REVIEWED BY STELLA BETTS

THE QUESTION of what defines "better" hovers over the tongue-in-cheek title of this book, *My House Is Better Than Your House*, which focuses on a private residence in southern France, the Villa Varoise, designed by Nader Tehrani of NADAAA. The Villa is primarily in conversation with the unbuilt Fahmy House, by Preston Scott Cohen. But, in fact, the conversation is "dedicated" to a series of unbuilt early houses with complex geometries Cohen designed—the Torus House and Wu House included—to which Tehrani's approach to form-making comes close with this project. At first glance, the exercise may seem insular, yet a deeper reading reveals that the betterment in the title is an effort to engage in a debate about design at a truly disciplinary and tectonic level.

The structure of the svelte, soft-bound volume is as instructive as the description of the Villa itself. The main text, running down the center of the left-hand pages and flanked by small images relating to that text, transcribes an event at Harvard's Graduate School of Design on April 16, 2012, the format of which was unconventional: Cohen presented the house designed by Tehrani, and Tehrani presented those by Cohen. Cohen and Tehrani are longstanding colleagues and friends, who for many years have been engaged in a candid dialogue, and a spirit of brutal honesty pervades. "We have a rare relationship," says Cohen. "He will tell me exactly what is wrong with what I am doing, and I will tell him what I think is wrong with what he is doing."



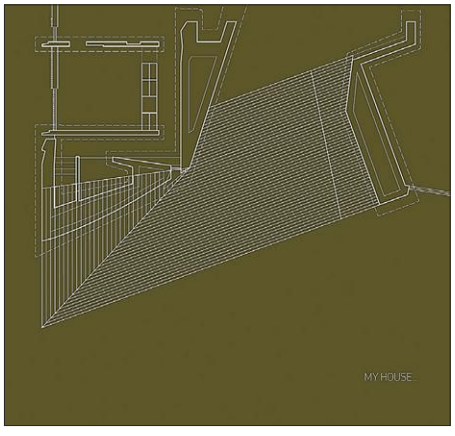
Villa Varoise in southern France, designed by Boston-based NADAAA.

With its conversational tone, the exchange captured in the book manages to complement the images and drawings more successfully than is usual in a conventional monograph. The dialogue goes beyond a comparison of the houses and leads to discussions of the typology of the house itself. By doing so, it transcends the conceit of dueling dwellings, opening up a larger discourse on the practice of architecture. But it's a fun read—both light and serious.

Included in the book is an essay by Robert Levit, associate dean of architecture at the University of Toronto. He writes specifically about Tehrani's practice, both past and present, and "what [Tehrani] has described as the relationship between figuration and configuration." Levit explains this as the difference between building parts (the material components that make up the structure) and the overall shape of the building. In the case of the Villa Varoise, the distinction has been blurred due to the nature of cast-in-place board-formed concrete, creating a house more reductive, singular, and pure. This, as Levit and Cohen both note, is a slight deviation from Tehrani's other work, in which the modularity and manipulation of the building material is expressed in the plastic form-making of the building itself.

The art of this book is that it can be enjoyed on several levels. It is a deep dive into the design process and the meticulous execution of one single house, and its surrounding landscape, taken from initial concept and site strategies through drawings, diagrams, models, and construction details. (Photos of the built structure, completed last year, occupy the book's right-hand pages, opposite the text.) But the book is also a manifesto—a reminder to all of us that as architects it is "our responsibility to change the status quo . . . to motivate the discipline, and produce not novelty, but innovation." If you manage that, then the results of the design process just may be "better." ■

Stella Betts is a founding principal at LEVENBETTS. Thirteen Ways of Looking at a House, by her and her partner, David Leven, is due for release in fall of 2021.



My House Is Better Than Your House, *by Nader Tehrani; introduction by Robert Levit. ORO Editions, 120 pages, $34.95.*

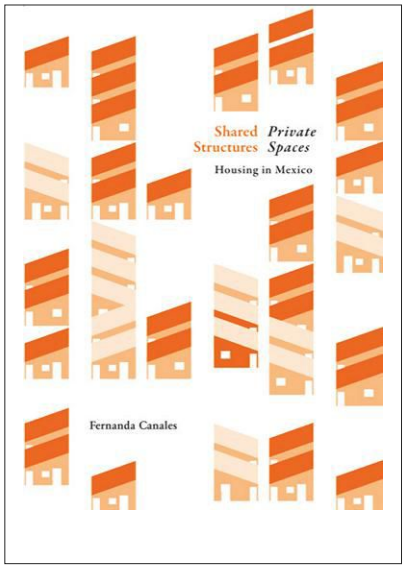
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There's No Place Like Home

Shared Structures, Private Spaces: Housing in Mexico, *by Fernanda Canales; introduction by Iñaki Ábalos. Actar, 350 pages, $46.*

REVIEWED BY FLORIAN IDENBURG



MEXICO'S unique alchemy of bountiful land, natural resources, inexpensive labor, and mild climate has long offered local architects, as well as progressive émigré architects from the European continent, countless sites of experimentation. The opportune blend has produced a vast collection of building "prototypes." The Mexico City–based architect Fernanda Canales has been an earnest and committed chronicler of this canon. Her latest book is an extensive catalogue of housing projects, nicely bound and published in a handsome volume by Actar. Canales argues that housing the society's population should be at the top of any country's agenda—that it is the collective pooling of individual particularities and idiosyncrasies that makes for civilization. Yet in this notion lies the challenge of the book: how to synthesize concisely this broad array of singularities?

Architectural publications typically combine words and images to best put forth a perspective on the works shown. But Canales's book does something decidedly different. It is split into two parts, texts and drawings. Canales repeatedly argues that the house, in its relation to its site, history, and occupant, is the essential building block of the world we produce. The world is currently in dire shape, she contends, and framing housing issues in a more human-centric way, making cities more ecologically, is necessary to save it. Channeling Aldo Rossi, she claims that a transformation in society is inconceivable without a change in architectural form. Domestic space is a setting for intervention, the stage upon which "a new life can be realized."

The bulk of the book consists of images of 70 multifamily projects, designed over the course of 100 years (between 1917 and 2017), intertwined with short statements by architects involved in housing during that period, including Luis Barragán, Alejandro Zohn, Tatiana Bilbao, and Zeller and Moye. The group of projects is sorted and reformatted by Canales and her team to compose a new whole. "What is shown are attitudes," writes Canales.

While the book argues for an individualistic conception of the home in relation to society, the chosen representation of the projects in fact strips them of all their character and singularity. The axonometric used to depict each project flattens it and reduces it to monochromatic graphics floating disconnected on a white page—the sites are merely city grids, devoid of buildings and life. The perspective of the citizen-dweller is absent. In their deconstruction, the question arises, what is there of the projects' attitudes to discern?

The book does a great job of consolidating an impressive selection of buildings, and includes many projects that offer even the connoisseur something new. Yet what we see on the page matters. How can one represent the vast array of collective lives in a personal manner? There might have been ways to maintain some of the buildings' and their inhabitants' personalities—a unit plan depicting how life might occur, an indication of where collective spaces appear, and some information about how many homes the building contains. Thankfully, Canales ends the book with the addresses of the buildings, so we can go and see for ourselves the inhabitants in their relation to the city around them. ■

Florian Idenburg is a founding partner of New York–based SO – IL. The office recently completed Las Americas, a collective-housing project in León, one of Mexico's fastest-growing cities.

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Shadow Play

In Kanagawa, Japan, Junya Ishigami creates an abstract space open to the wind, rain, and sky.

BY NAOMI R. POLLOCK, FAIA

THIRTEEN years ago, Junya Ishigami astonished the architecture world with the completion of the Kanagawa Institute of Technology (KAIT) Workshop, a glazed parallelogram supported by a staggering 305 sliver-like columns (RECORD, November 2008). Now Ishigami has done it again with the Plaza at KAIT. Instead of columns, the main motif this time is thin sheets of pure white steel. Perforated with windowlike openings, the panels enclose a versatile semi-outdoor space—the main place on campus where students can kick back and cut loose.

As with the Workshop, the Plaza sits comfortably within KAIT's gridded master plan, but its unique geometry relates to local site adjacencies. Devoid of right angles, the structure's 43,000-square-foot, roughly trapezoidal footprint curves slightly inward, acknowledging the arched plan of an adjacent baseball diamond, but comes to a sharp corner near its own main entrance, opposite the Workshop. Two additional doorways are located on the opposite and adjacent walls respectively.

Blanketing its site, the low-slung building has a column-free bowl-shaped floor plane that gradually descends 16 feet, slanting in at different angles from each side. It flattens out near, but not at, the building's center point. "The lowest part is as far as possible from the entrance, so you can enjoy the approach," explains project architect Masayuki Asami. Ishigami compares this artificial landscape to a sloped riverbank. Instead of water, however, the eye is drawn to patches of sunlight, sky views, and, in the distance, an artificial horizon where the





PHOTOGRAPHY: © JUNYA ISHIGAMI+ASSOCIATES

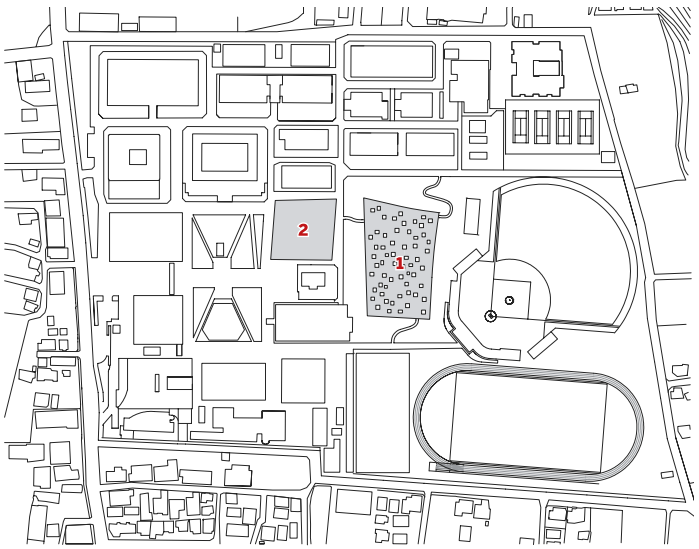
Under the right conditions, the scattered openings in the steel-plate roof (above) create patches of sunlight on the Plaza's irregularly sloping ground surface (right).







The bowed roof, with its apertures that frame the changing clouds (right), loosely follows the dip of the floor to define an approximately 8-foot-tall space (above), similar to the ceiling height in a typical Japanese house.



1 PLAZA AT KAIT
2 KAIT WORKSHOP

SITE PLAN

curved floor and ceiling appear to meet. While fixed windows punctuate the walls, 59 unglazed rectangular apertures overhead admit rain, breeze, and daylight, the only interior illumination. Echoing traditional Japan's love of shadows, the play of light and dark recalls the interaction between sun and clouds on an overcast day.

But the Plaza's elegant simplicity belies the complexity of its construction—a signature of Ishigami's architecture. Spanning a maximum of 295 feet, the bowed roof loosely parallels the ground, consistently maintaining a low ceiling height of about 8 feet, akin to that of the typical Japanese house. "How to create a smooth roof surface was the most difficult part of the project," says the architect. Working with Jun Sato Structural Engineers, he achieved this by enlisting both robots and construction workers to weld the ½-inch-thick panels on-site. Because of this remarkable thinness, constant checking by the contractor was required to prevent distortion. "Even robots aren't perfect," jokes Ishigami.

Another engineering feat was supporting the roof just with 10-inch-thick sandwich walls. Composed of steel sheets and ribs, they are both skin and structure. At the building perimeter, movable pin joints connect the walls and roof while accommodating expansion and contraction due to heat gain. A 10-foot-deep ribbed compression ring helps carry the roof's weight. Triggering a system-wide ripple effect, seemingly minor adjustments, such as thickening the walls' steel plate, were needed to offset loading inconsistencies generated by the building's irregular shape and scattered roof openings. Below grade, the walls are supported by 20-foot-deep reinforced-concrete piles and 62-foot-long steel anchors, both secured by a massive concrete foundation beam. Ishigami likens the Plaza's support system to a suspension bridge in the round. "In this structure, the force comes from all directions," he explains.

Unifying the entire building, the steel surfaces are all painted different white tones. To mollify undulations caused by the wind, the roof is topped with water-permeable asphalt whose white color limits heat gain. Similarly, the grayish white floor is also made of water-permeable asphalt, enabling students to sit directly on its sloped surface even on rainy days. "I wanted to make a close relationship between the body and the building," explains Ishigami. Abstract yet intimate, scaleless yet human-sized, the Plaza offers that possibility. ■

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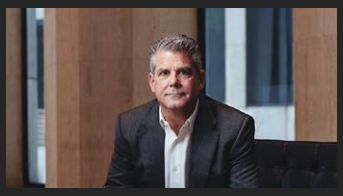
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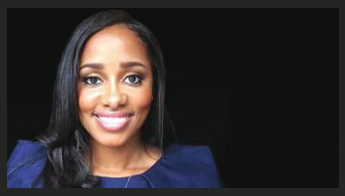
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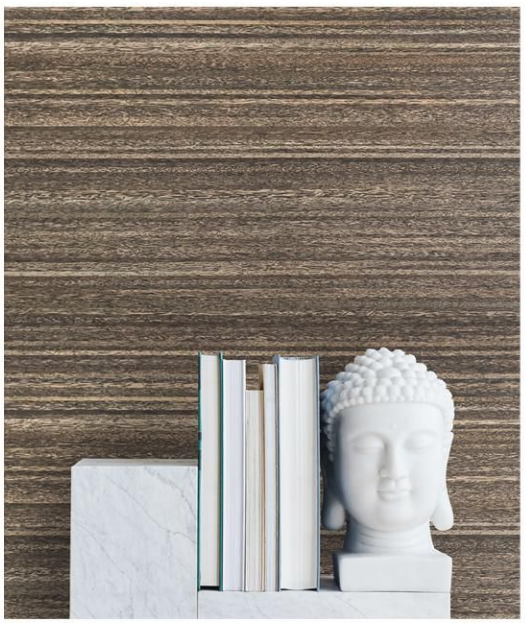
From rigid palm panels to terrazzo-like quartz, these new materials mix performance and style.

BY SHEILA KIM

2021 Design Collection

3form has unveiled its 2021 palette for its translucent Varia and Chroma resin panels: each is now available in 13 new earthy and soft neutral hues, from dusty blues and cool grays to autumnal orange tones. Both lines are offered in two formats.
3-form.com





Durapalm Sugar Linear

The latest Durapalm panels from Smith & Fong feature striations that are visually appealing, whether installed vertically or horizontally. They are made with Indian black palm covering a bamboo core for added strength. The ¾"-thick panels are available in 48" x 72" and 48" x 96" formats and boast Class-C fire rating and low emissions.
durapalm.com

Everform

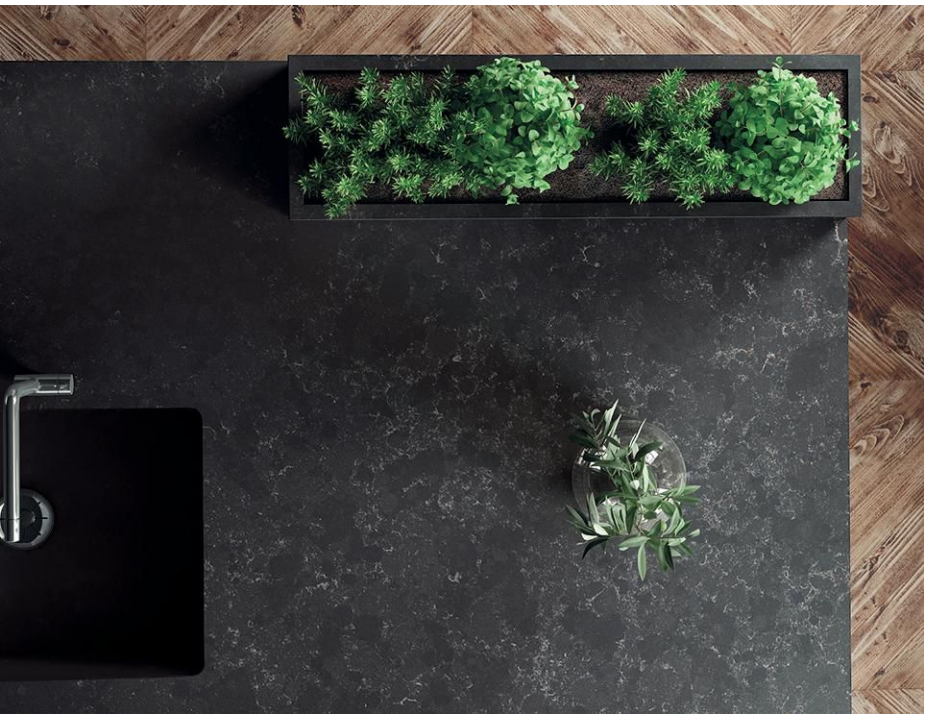
This acrylic solid-surface collection by Formica has been expanded, with eight new designs ranging from modern to minimalist—think terrazzo in a black-to-white spectrum—some with larger high-contrast flecks. The through-color material is seamless and nonporous for horizontal or vertical applications.
formica.com





Invisible Blue

Artistic Tile's latest slab offering is a variegated marble with gray veins on a pale blue background. Intermittent swaths of taupe and graphite add visual interest. The stone has a polished surface, and each piece measures about 4' x 8' and ¾" thick. Named Invisible Blue, it is well suited to fireplace surrounds, interior walls, and countertops.
artistictile.com



Loft Series

This Silestone quartz collection takes inspiration from five urbane neighborhoods that are known for their industrial architecture and former grittiness. Corktown (Detroit), for example, evokes the light and shade of a manufacturing scene via a deep black ground with bursts of gray clouds. Other designs include Seaport and Nolita (New York), Camden (London), and Poblenou (Barcelona).
silestoneusa.com



5114 Calacatta Maximus

Putting a new spin on classic Calacatta marble, Caesarstone introduced this quartz surface that exaggerates the popular stone's veining. As shown here, its large-scale soft greige veins outlined in copper and gold create a bold, definitively contemporary look. The ¾"-thick material comes in a standard size of 120" x 56 ½".
caesarstoneus.com

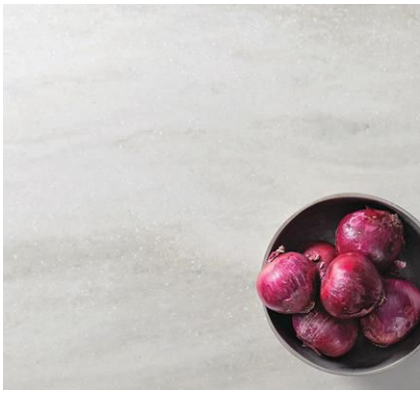


Coordinates Collection

Quartz surfacing manufacturer Cambria teamed up with architecture firm Gensler to develop these 14 designs suitable for both residential and commercial applications. Ranging from white terrazzo-inspired speckled surfaces to varying shades of gray that emulate concrete, the collection is offered in 132" x 65½" slabs, as well as six tile formats.
cambriausa.com

New Solid Surfaces

Wilsonart added three new acrylic solid-surface options to its offerings. Cloud Mist (shown) sports warm-gray waves and white particulates on a light gray ground; Calming Waves is off-white with rose undertones and white wisps; and Quiet Swirl mixes gray and white veins to create visual movement. Each sheet is 30" x 144".
wilsonart.com





Craftizen

Coming next month, Dekton's Craftizen collection channels Venetian stucco textures—only these sintered-particle panels are a lot quicker to install and easier to maintain. The large-format panels will launch with five colors: tan, dark gray, dusty white, salmon pink, and a silvery gray. Craftizen features high resistance to weather, abrasion, UV rays, and staining.
dekton.com

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Presented by: Stainless Structurals

WINDOW CODE FUNDAMENTALS
1 AIA LU/HSW
Presented by: Andersen Corporation

On the Face of It

These facade systems aim to address both aesthetic and thermal needs.

BY SHEILA KIM



S1 System

This ventilated rainscreen assembly by Florim is an aluminum anchor structure that can secure any of the manufacturer's large-format porcelain products directly onto a building. The porcelain slabs themselves—available in a wide selection of designs—are 6mm thick and boast inherent energy-saving thermal properties.
florim.com



Steni Vision

Made of a stone-composite material, these printed facade panels from Norwegian manufacturer Steni are available in 14 standard patterns and three gloss finishes. Custom graphic printing is also available. According to the company, Vision is easy to maintain and comes with a 60-year warranty.
steni.com

Ascend Composite Cladding

A system by Alside, Ascend mimics a wood-grain texture in a blend of glass-reinforced polymer and graphite-infused polystyrene. The Class A fire-rated units are lightweight, offered in 20 fade-resistant colors, and utilize a self-aligning stack lock that eliminates the need for caulking or flashing and reduces installation time.
ascendcompositecladding.com





Versawall H+

Centria has expanded its Versawall line of insulated metal panels with the introduction of H+. Whereas V and V+ are vertical systems, this new system is made for horizontal applications. It is offered in a choice of 42 solid colors, 22 textured finishes, and 33 special coatings. The panels measure 6' wide x 30" or 36" high and 2" or 3" thick.
centria.com



Materica

Taking cues from terra-cotta and concrete, this Ceramiche Caesar porcelain collection offers seven neutral hues with variegations that create a handcrafted, artisanal look. Available in matte or satin finishes, the tiles come in both smaller and large-format tiles, from 9" square to 47" square.
caesar.it



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BUILDING TYPE STUDY 1,028

RECORD HOUSES 2021

58 Casa en El Torón, Oaxaca, Mexico
IUA Ignacio Urquiza Arquitectos

64 Oregon Coast Beach House, Bandon, Oregon
Cutler Anderson Architects

70 Casa A4, Lima, Peru
Barclay & Crousse Architecture

78 Bay Window Tower House, Tokyo
Takaaki Fuji + Yuko Fuji Architecture

84 Awana Beach House, Aotea Island, New Zealand
Herbst Architects

90 Stony Hill, Amagansett, New York
Bates Masi + Architects

PHOTOGRAPH BY ANNA SUSHKINE

CASA EN EL TORÓN, DESIGNED BY IUA IGNACIO URQUIZA ARQUITECTOS

Natural Selection

Architect Ignacio Urquiza responds to a rugged site in Oaxaca by designing a residence as three open pavilions.

BY CLIFFORD A. PEARSON
PHOTOGRAPHY BY ONNIS LUQUE

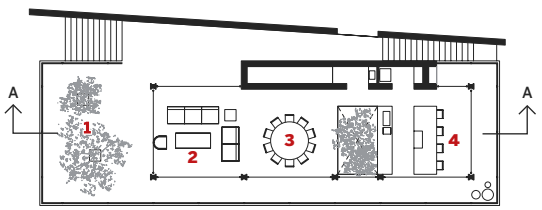
AS A TEENAGER, Ignacio Urquiza traveled with his father, a photographer, as he captured images of the houses, food, and culture of Mexico's Pacific coast. Often, "the houses were just pergolas and terraces," he remembers. In a place that's always hot, with little rain six months of the year, minimal enclosure was the best strategy. The Mexico City–based architect kept that in mind when he designed Casa en El Torón on a particularly beautiful—and rugged—private reserve of the same name in the state of Oaxaca, overlooking Playa Ventanilla. "The site is magnificent," says Urquiza. "Everything we did was driven by respect for it."

The clients, a couple with two young children, also from Mexico City, had asked Urquiza to develop a master plan for the 25-acre reserve. For about a year, Urquiza visited the site repeatedly with the clients. They considered a range of options, but eventually pared down the plan to just a few houses—the first one, Casa en El Torón, would be a vacation home for the clients to use once a month and rent out the rest of the time. A second house, also designed by Urquiza, is under construction. To fit in with the steep topography and break down the scale,



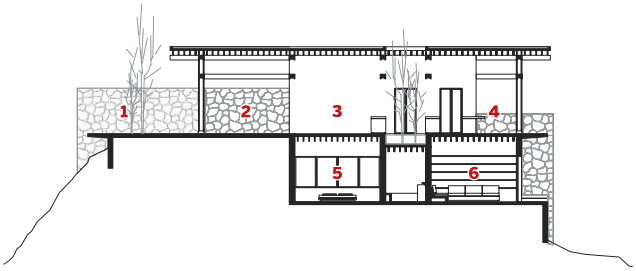
THE HOUSE'S three pavilions take advantage of the steep topography to capture views of the coast and maintain a comfortable distance among them. No cars are allowed on the private reserve, so all construction material had to be taken to the site on carts and motorcycles.





PAVILION A UPPER-FLOOR PLAN

0 15 FT.
5 M.



PAVILION A SECTION A - A

1 TERRACE
2 LIVING ROOM
3 DINING ROOM
4 KITCHEN
5 BEDROOM
6 STUDIO

COLUMNS and beams in the main pavilion are made of an 8-by-8-inch concrete core sandwiched between wood planks (opposite, top and bottom). A nearby structure with sleeping quarters for guests and children is kept cool by stone walls (right).

Urquiza designed Casa en El Torón as a trio of pavilions climbing the rough terrain. The main one, at 4,520 square feet, has a bedroom and a studio on a lower level, and living, dining, and kitchen spaces above. A nearby second module of 1,615 square feet—all on one floor—offers sleeping accommodations for four people and a small, partially covered, patio. Farther away is a 3,015-square-foot structure with a pair of bedrooms, as well as its own living, dining, and kitchen areas, so it can function as the clients' secondary retreat when the other pavilions are rented.

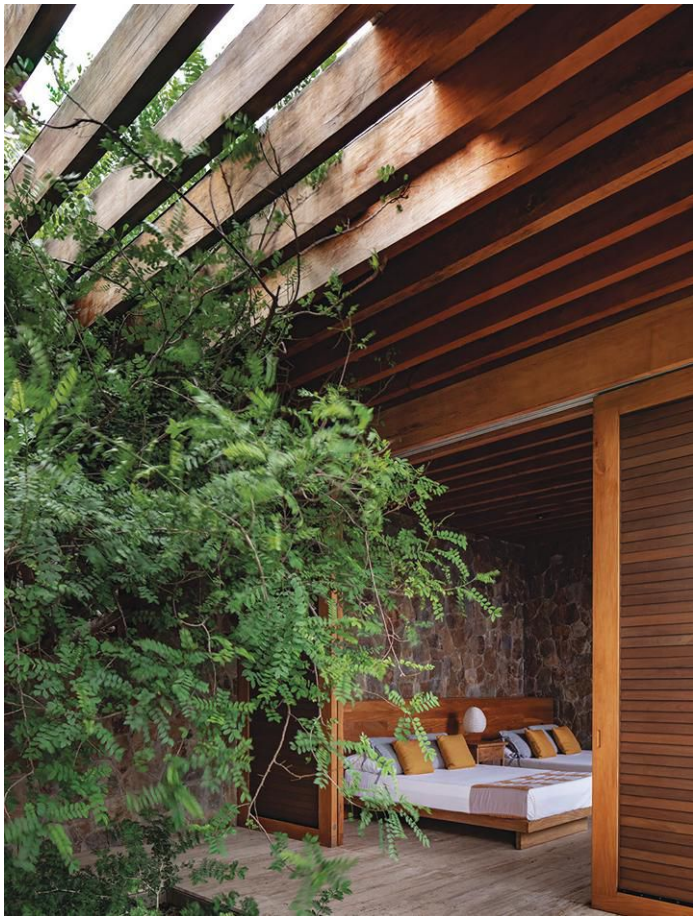
"I saw the house as a series of terraces," says Urquiza, emphasizing the importance of outdoor spaces. Rather than just hugging the ground, though, those spaces sit on the upper level of the two larger dwellings, so they can offer views in all directions and catch breezes coming off the coast. Living, dining, and cooking—uninterrupted by interior partitions—take place in the open air, seemingly floating above the land. A simple framed structure of concrete-and-wood columns and beams, topped by a reinforced-concrete slab roof, is all that defines this free-flowing space in each building. Instead of enclosing walls, perforated PVC curtains can roll down from perimeter beams to provide protection from sun and rain, when needed. The only solid walls are those that enclose a bathroom and pantry pushed to the uphill side of the main module.

Sleeping quarters—whether on the lower floors of the large units or in the single-level small one—have a strikingly different character. Wrapped in walls made of carefully chosen local stone, the bedrooms are rooted in the ground, protected and dark instead of open and bright. Adjustable wood louvers bring in, or shut out, daylight and air, eliminating the need for any glass in the house. Small openings between wood roof beams also contribute to natural ventilation. Although the bedrooms have air-conditioning to satisfy the demands of renters, Urquiza says it is very rarely needed.

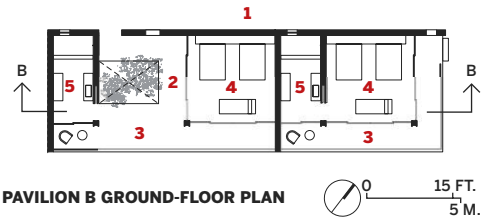
Minimizing the impact on the environment was a major concern, says Urquiza, and affected almost all decisions. No cars are allowed in the preserve, so parking is restricted to an area at the edge of the property, about two-thirds of a mile from the house.



NO GLASS was used in the entire house. Instead, bedrooms have openings protected by adjustable wood louvers (this photo), as seen in the smallest pavilion. A private patio (below) offers a partially protected retreat off one of its two sleeping quarters.

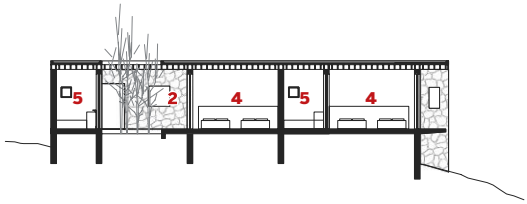


Golf carts and motorcycles transported all construction materials to the building site, and no heavy equipment was employed. Urquiza specified local materials—such as a tropical wood for columns, beams, and louvers, and the brownish granite from the site itself for walls. Craftsmen from Oaxaca assembled large, irregular pieces of the granite to form the structural walls enclosing sleeping areas and stacked horizontal strips of it to make low retaining walls. The cream-colored stone used for all of the terraces and paving is a travertine brought in from



PAVILION B GROUND-FLOOR PLAN

0 15 FT. 5 M.



PAVILION B SECTION B - B

0 15 FT. 5 M.

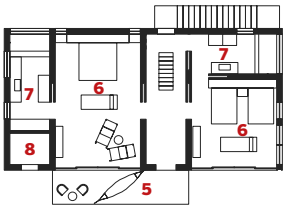
1 PLAZA
2 INTERIOR PATIO
3 TERRACE
4 BEDROOM
5 BATHROOM



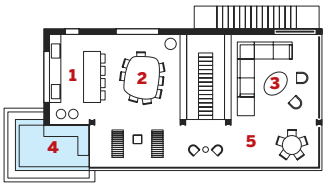
THE MEDIUM-SIZE pavilion (here) can act as an independent unit when the other two are rented. Ana Paula De Alba designed all interiors and furniture in the house.

Veracruz, the state just to the north of Oaxaca. The texture of the travertine prevents slipping when wet and its light color makes it easy to see snakes and scorpions, if they should wander in.

Like Oaxacan cooks who take their time preparing local moles, Urquiza and his clients didn't rush the process of creating Casa en El Torón. After designing each of the pavilions in his office, the architect came to the site to stake out the three footprints, adjust them to capture the best views, and figure out the patios and outdoor spaces between the buildings. He took advantage of the steep terrain to fragment the architecture and give each piece of the house its own sense of place, as defined by outdoor stairs, retaining walls, and landscaping. As a result, he established an intriguing dichotomy of the particular at ground level and the more ambiguous above, where you're not quite sure if you're indoors or out. In the house's bedrooms and the outdoor spaces around them, you feel connected to the specific, while in the social areas above you can lose yourself in the sky, the sea, and the horizon. ■



PAVILION C LOWER-FLOOR PLAN



PAVILION C UPPER-FLOOR PLAN

0 15 FT. 5 M.

1 KITCHEN
2 DINING
3 LIVING
4 POOL
5 TERRACE
6 BEDROOM
7 BATHROOM
8 CLOSET

Credits

ARCHITECT: IUA Ignacio Urquiza Arquitectos — Ignacio Urquiza Seoane, design lead; Michela Lostia di Santa Sofía, project manager; Anaís Casas Giaccardi, Paulina Buenrostro, María del Mar Carballo, design team

ENGINEER: Ricardo Camacho (structural)

INTERIOR DESIGNER: APDA — Ana Paula De Alba, design lead; Sacha Bourgarel, design team

GENERAL CONTRACTOR: Alonso García Cano & Santiago Gaxiola

CONSULTANT: Alejandro Lirusso, lifeflow group (bio-technical)

CLIENT: withheld

SIZE: 9,150 square feet

COMPLETION DATE: June 2020

SOURCES

FURNITURE: APDA (custom)

WOOD DOORS AND WINDOWS: Alonso García Cano & Santiago Gaxiola (fabricated on-site)

Bold Coast

On a blustery Oregon beachfront, architect James Cutler creates a dwelling that offers both a sheltered courtyard and dramatic views.

BY RANDY GRAGG
PHOTOGRAPHY BY JEREMY BITTERMANN



REMNANTS of the Jurassic era, the rock formations known as "sea stacks" anchor some of the moodiest vistas to be found along the Oregon coastline. The wind, rain, sand, and salt that shaped them are often still hard at work. Sunny, breezy days have made the beach town of Bandon one of the U.S.'s premier golfing destinations. But when the gales come, summer or winter, their force can almost blast the paint off a car.

The built environment of this stretch of the coast can be equally harsh, visually. Large, multigabled "beach houses" slot into narrow lots like Monopoly pieces. For one of the few remaining oceanfront residential sites, James Cutler designed what he calls a "house in pieces"—a square form that unites three volumes with a courtyard, with the western face sheathed entirely in glass. The compound reaps the rewards of the view while shielding it from the toughest elements, natural and manmade. "The goal was to keep the architecture as quiet as we could," he says, while "building it like a tank."

A "modernist building cloaked in native materials," as Cutler describes it, the house has 1-inch-thick-by-10-inch-wide cedar planks wrapping three sides to create a form so minimal it could be mistaken for a tall fence. But step inside the bright Douglas fir door and a procession unfolds, contracting and expanding in visual breaths. Beyond a narrow vestibule, you find yourself outside again, on a walkway of cedar



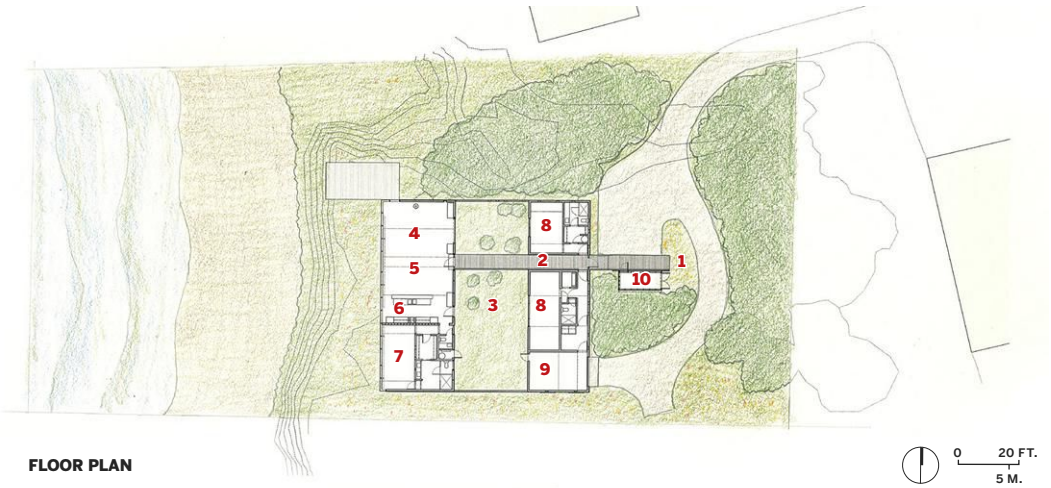


THE LIVING SPACES (above) overlook the Pacific Ocean. On the opposite side of the house, a walkway (right) cuts through the bedroom wing and the courtyard to the oceanfront area (right).



COASTAL views are dramatized through 15-foot-high glass walls (above). One corner of the living area seems like the prow of a ship (opposite). In the middle of the house is the open courtyard, protected from winds (right).





FLOOR PLAN

1 ENTRY
2 WALKWAY
3 COURTYARD
4 LIVING
5 DINING
6 KITCHEN
7 MAIN BEDROOM
8 BEDROOM
9 GARAGE
10 STORAGE



two-by-fours (topped by a 5-by-48-foot CLT roof), which hovers over a courtyard carpeted in clover. Through another fir door, the main living space appears to merge, sublimely, with ocean waves and sea stacks through a 15-foot-high curtain wall of glass.

"With that view, the effect is much like Dorothy opening the door in *The Wizard of Oz*," Cutler says. "Things go from black-and-white to Technicolor."

The architect got the idea for the open-air connection of the living spaces from the 80-square-foot cabin next to his Bainbridge Island house near Seattle that he built some years ago for, and with, his then 10-year-old daughter. For Cutler, its distance from the main house yielded an epiphany. "What I discovered is, it's no big deal to walk 35 feet, whether it's snowy, rainy, or cold," he says.

In plan, the Bandon house is essentially a 62-foot square divided internally into four components: the ocean-facing ensemble of the living/kitchen area and main bedroom; the courtyard; and the rear bedroom volume, all united by the boardwalk. Beachside, the curtain wall's full 62-foot length levitates over the landscape, supported on pilings, with particularly uncanny elegance at night. The optimal view from inside, Cutler argues, is "two-thirds sky and one-third object"—the latter, in this case, the sea stacks and the ocean beyond. To achieve the proportion, the architect sloped the ceiling at a gentle 1-to-12 pitch.

Cutler's use of a fully integrated curtain wall when he retrofitted the LEED Platinum Edith Green-Wendell Wyatt Federal Building in Portland, Oregon, in 2013, inspired his inclusion of it here. Operable windows that can perform as high as 400 feet in the air, he says, are well matched to Bandon's "caustic" storms. To limit obstructions to the view, the ocean end of the ceiling is lifted on steel posts and beams, the latter cantilevered and tapered at the ends to visually express the load. Cutler's years of matchmaking wood and steel members in so many of his projects led him to stretch a 12-inch-wide shim, precisely milled on-site, to fit the angle between beam and rafters. Other such carefully integrated







STEEL POSTS AND BEAMS support the wood timber-frame ceiling (above.) The construction opens up views of the ocean for the living and dining area (left).

moves range from salt-resistant bronze flashing to the narrow vertical windows seamlessly fitted between some cedar planks on the house's sides. While architecturally astute contractors are not abundant in Oregon coastal towns, Cutler says, his builder, Tom Harmon of Coos Bay, was as skilled as any he's worked with. The landscaping—which the architect designed himself—offers an equally careful fit of the house's strict geometry to the soft contours of the site.

The house-in-pieces offers socially pragmatic advantages, too—"space for family dramas," Cutler says, noting his own family of six. With frequently visiting kids and grandkids, the Bandon couple were the first clients who let him try this parti. The result, he feels, is "one of the top two or three houses I've ever done." Despite the normal designer/client tug of war over costs (the curtain wall gobbled 20 percent of the budget), Cutler and the family became close enough friends that he has guest privileges. During a recent stay, the space between living areas worked as planned. On a clear but blustery night, the architect, with his daughter and cabin collaborator, now 16, enjoyed a courtyard-protected view of meteor showers.

"The experience was just terrific," he says, "another visceral way to connect people to a vital, active planet." ■

Randy Gragg is a Portland, Oregon–based writer on landscape, urban design, and architecture.

Credits

ARCHITECT: Cutler Anderson Architects — James Cutler, design architect; Bruce Anderson, partner in charge; David Curtin, project architect

ENGINEER: Madden Baughman Engineering (structural)

GENERAL CONTRACTOR: Harmon Construction

CONSULTANTS: Terra Firma Services (geological); Geoff Smith (landscape installation)

CLIENT: withheld

SIZE: 2,445 square feet

COMPLETION DATE: May 2020

Sources

CURTAIN WALL: Smith Glass/Kawneer

LIGHTING CONTROLS: Lutron

KITCHEN FREEZER AND WINE COOLER: Sub-Zero

DOORS: Simpson Door

HARDWARE: Häfele; Revere Hardware

LIGHTING: Tech Lighting, Translight; Armacost (LED RibbonFlex light rope)

PLUMBING: Grohe, Teorema, Dornbacht, Toto



THE HOUSE'S straightforward street presence (opposite) belies the unusual arrangement of volumes and voids behind it (this page).



Urban Oasis

Barclay & Crousse juxtaposes plein air living spaces with cell-like sleeping quarters in Peru.

BY JOSEPHINE MINUTILLO
PHOTOGRAPHY BY CRISTÓBAL PALMA

"THERE ARE no weather forecasts in Lima," Sandra Barclay and Jean Pierre Crousse have joked when presenting their work. It is an especially significant point given the difference between designing in their home city, to which they returned in 2006, and Europe, where they had been based since founding their eponymous firm in Paris in 1994. The climate of the Peruvian capital—with year-round mild temperatures and moody conditions of light and shade produced by the often lingering cloud cover—has unquestionably shaped Barclay & Crousse's architecture. It has influenced not just the large freestanding civic and cultural projects they have built within the city and along the country's rocky coast, but even this two-story house on a tight urban plot in Lima's San Isidro neighborhood near the waterfront.

Using the limits of the site, the architects established a startling but ordered juxtaposition of volumes and voids, creating a ground-floor living space of extraordinary openness contrasted by intimate upper-level sleeping quarters, all bordered by 13-foot-high perimeter walls required by code. The scheme "floats" three parallel concrete bars over the rectangular parcel,





leaving the area below exposed. These mainly opaque bars of similar size, containing the four bedrooms, are connected by a narrow, transparent skybridge. They rest atop the thickened lateral walls at grade, offering a means of enclosure, when desired, for the sitting, cooking, and dining spaces directly beneath each of them, but separated by lushly planted courtyards.

This unusual amalgamation, impossible in most other contexts, is concealed behind the dwelling's rather ordinary street face. Set back several feet behind a fence of solid weathering-steel panels, the front concrete volumes are punctuated at the top by a wood *mashrabiya* screen masking the main bedroom on the second floor. The barrier acts in much the same way as the closed wooden balconies, or *miradores*, of Lima's historic center, a remnant of the Islamic traditions, carried over to southern Spain, that have influenced Peruvian architecture since colonial times.

Past the imposing fence, fashioned by local steel artist Pool Guillén, cars descend to the garage, part of an expansive basement. A small staircase leads to the main floor, several feet above grade. There, almost invisible glass walls—they lack mullions or silicone joints between panels—separate interior from exterior. The glazing retracts to blur the distinction entirely, leaving the tropical wood floors, smooth marble walls, dense brick elements, and luxuriously upholstered furnishings, to occupy the same space as the courtyard's board-formed concrete, grass, foliage, pebbled surfaces, and water features. "We don't need to weatherproof here," says Crousse.

Working in Peru has brought different challenges, however. Tight security measures restrict entry to the home's second level, a reminder of the kidnappings and political unrest that plagued the country at the end of the 20th century and instigated to some extent the architect couple's exile in Europe. Their competition-winning 2013 project, A Place of Remembrance, a 50,000-square-foot cultural center dedicated to the victims of that era, is embedded in the cliffs and ravines just several hundred yards from this house.

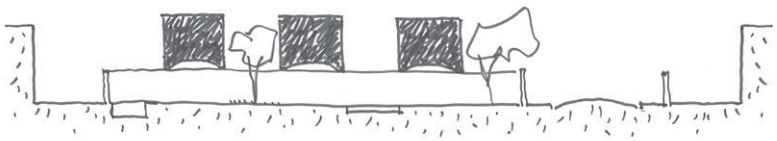
The elongated bar-like volumes of the second floor, despite their limited accessibility, play a critical role in the architectonic experience of these confines. With their large protruding windows, they are even

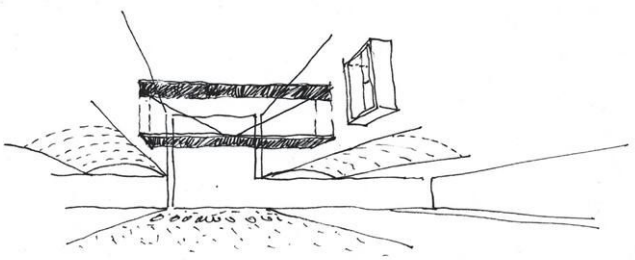


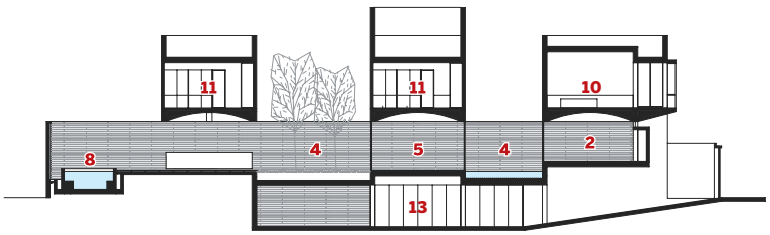




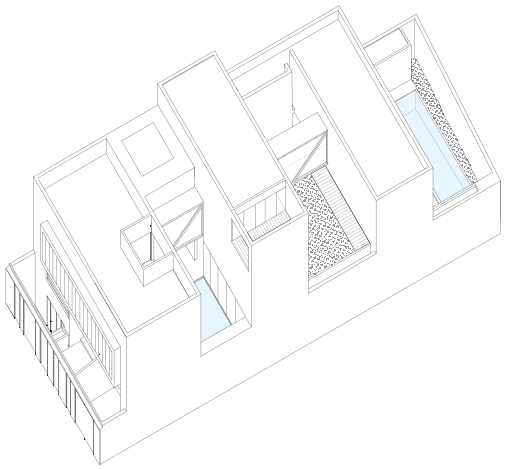
THE GLASS walls that enclose living spaces slide open (above), allowing interior furniture and finishes to be continuous with the water elements (right) and planted surfaces (top, right) of the courtyards.



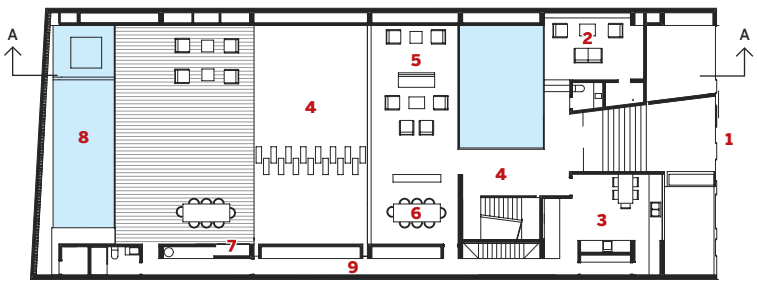




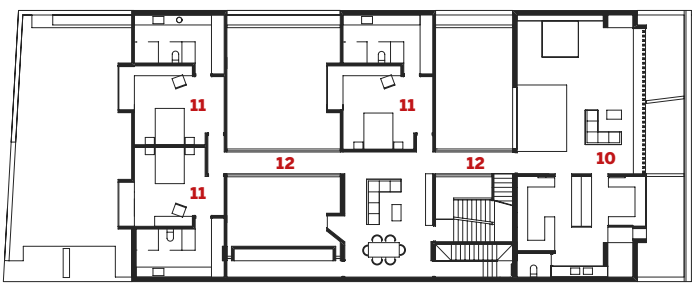
SECTION A - A



AXONOMETRIC



FIRST-FLOOR PLAN



SECOND-FLOOR PLAN

1 ENTRANCE
2 DEN
3 KITCHEN
4 COURTYARD
5 LIVING
6 DINING
7 OUTDOOR GRILL
8 POOL
9 SERVICE WALKWAY
10 MASTER SUITE
11 BEDROOM
12 SKYBRIDGE
13 BASEMENT

Credits

ARCHITECT: Barclay & Crousse Architecture — Sandra Barclay, Jean Pierre Crousse, partners; Martín Montañez

ENGINEERS: Jorge Indacochea (structural); Walter Palomino (electrical); Equipo G (plumbing)

GENERAL CONTRACTOR: Yuri Bustíos

CONSULTANTS: Lisette Miró Quesada (landscape); Trazzo Iluminación (lighting); Jordi Puig, Architect (interior design); GAMA Arquitectura (fixed furnishings)

CLIENT: Rafael Arbulú

SIZE: 11,200 square feet

COMPLETION DATE: January 2019

Sources

MARBLE: Casa Rosselló

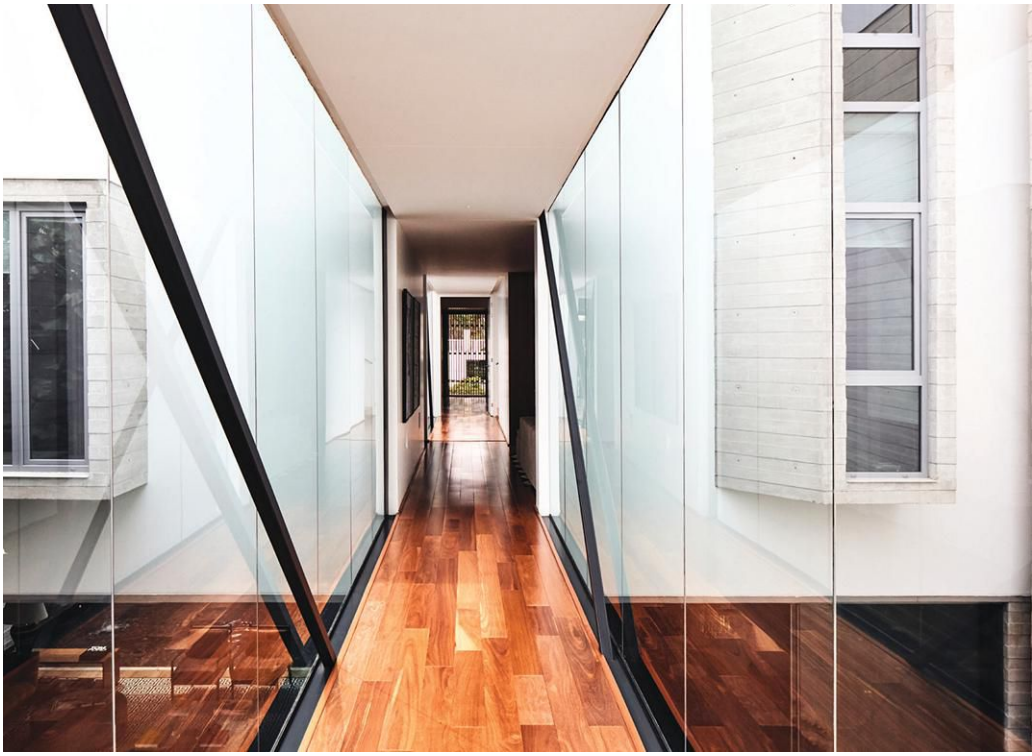
GLAZING: Miyasato

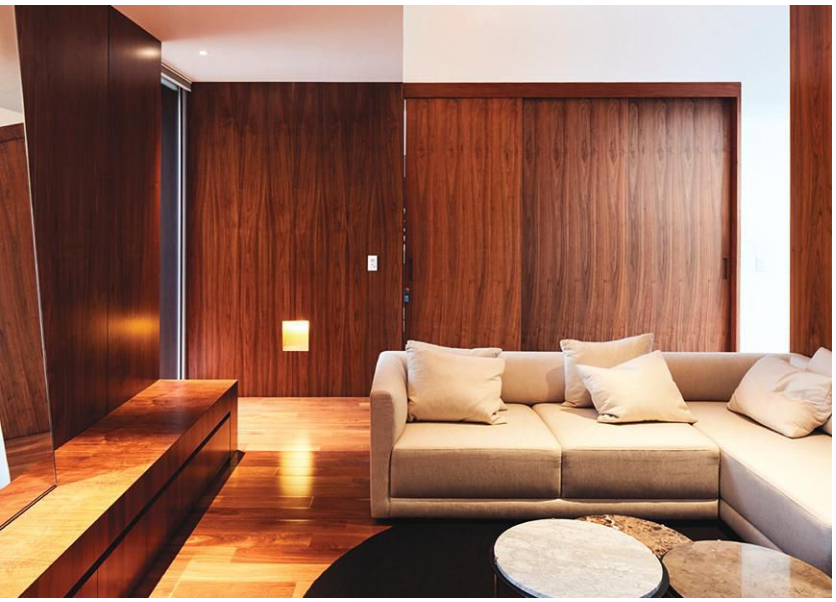
HARDWARE: Euroinox

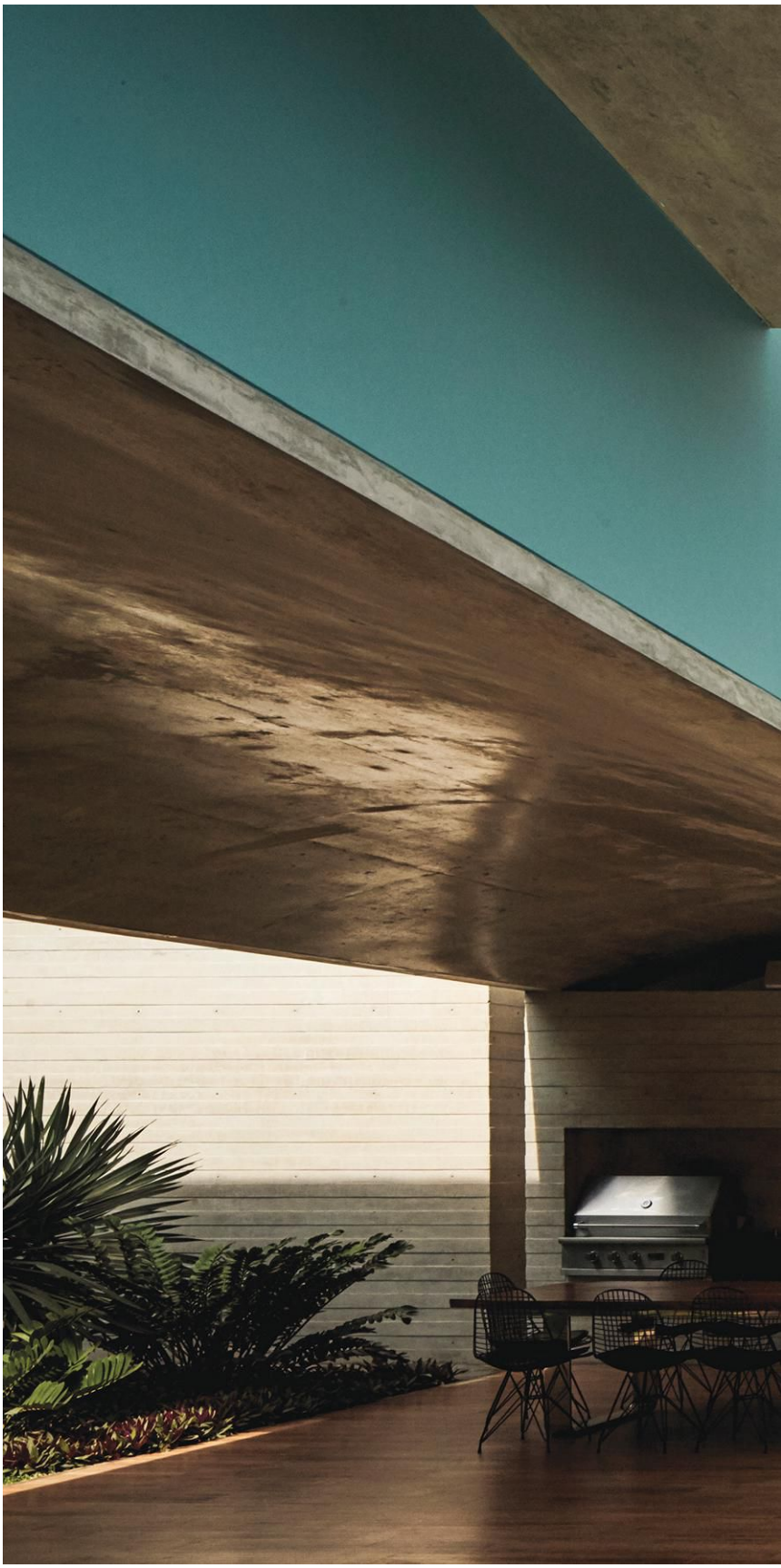
PAINT: Vencedor

THE LIVING and dining areas share the space underneath the middle bar (this photo). A glass skybridge connects all three bars (below, right). Interiors feature a rich palette of materials (below).









A SEATING AREA on the upper level (above) offers a more intimate room than other parts of the house, which culminates with a covered space for outdoor grilling and a pool (right).

more like the *miradores*, known as "streets in the sky," than the front screen, allowing protected views to activity below them. The undersides of the bars form the gently curving tops of the living spaces. The architects had several reasons for vaulting those ceilings. The abutments at each end of the arches conceal the additional structure—reinforced-concrete columns within the lateral walls—that supports the suspended volumes in this seismic zone. The bowed surface, on the other hand, better distributes natural light on those frequent overcast days as well as the electric illumination, hidden within the air space between the walls on either side. Those double walls, atop which the 44-foot-long bars sit, also accommodate storage. Along the south edge, the architects pulled the walls even farther apart to allow for a discreet walkway between the kitchen and the outdoor grilling area by the pool.

But beyond the multifunctional aspect of certain building elements, a strategy Barclay & Crousse often employs, the house offers the strong sectional quality—with changing conditions of space from top to bottom—for which the architects have come to be known in their larger projects. At A Place of Remembrance, for instance, visitors enter from the cliff's summit and descend to the exhibitions; at Edificio E at the University of Piura in Peru, winner of the 2018 Mies Crown Hall Americas Prize, the elaborate roofscape is an integral part of the design, a true "fifth facade."

But this is a building without any real facades and, here, Barclay & Crousse has created not a house but a landscape, one that offers alternating experiences of space, enhanced by a diversity of materials, both natural and manmade. Yet, as rich as that is, there is an unfinished aspect to the project—the feeling persists that one can fill in a void, or add to a bar. Indeed, the middle bar grew upward during the protracted design process, as the family desired a studio above the bedroom there. It is a testament to the architects' approach to formmaking that the design was not impeded by the confines of the site, but instead became more flexible, more nuanced, and, in the end, most exceptionally livable. ■



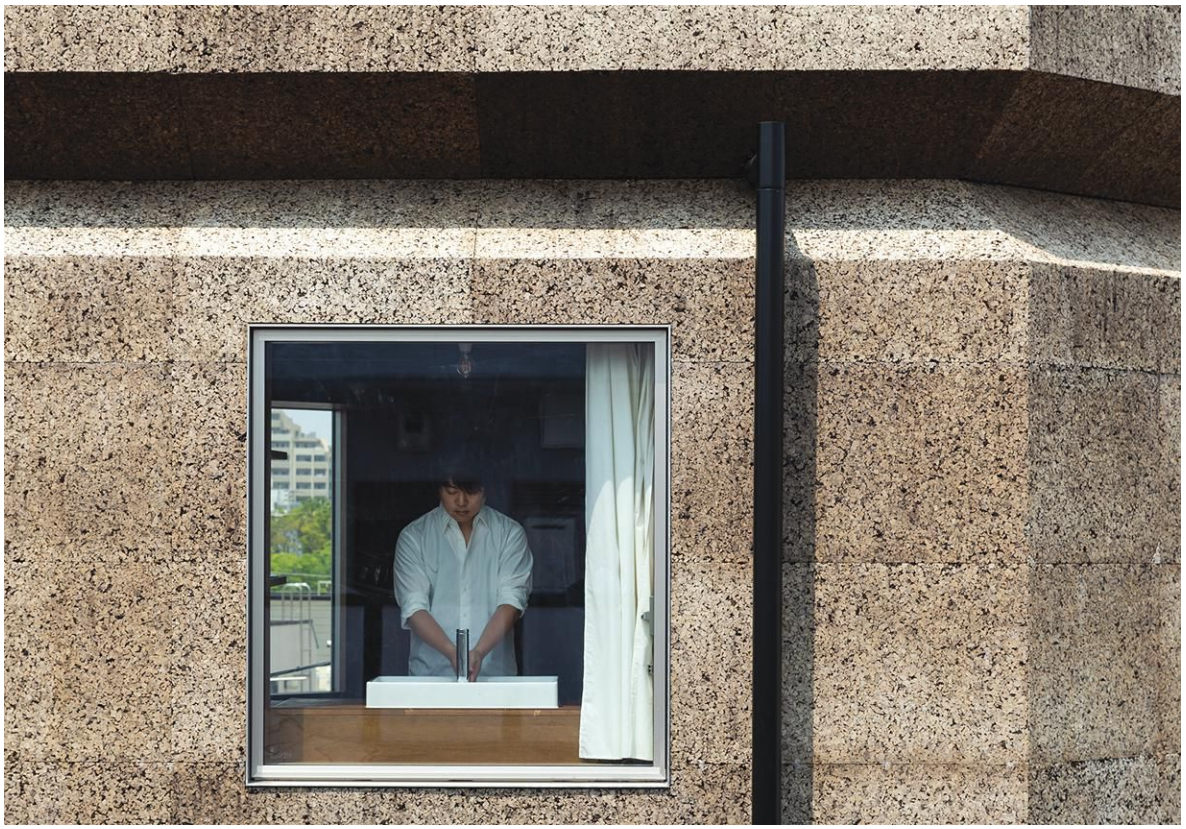
Cutting Corners

Partners in design and life, Takaaki and Yuko Fuji tailor their own home for living on a tight Tokyo site.

BY NAOMI R. POLLOCK, FAIA
PHOTOGRAPHY BY MASAO NISHIKAWA

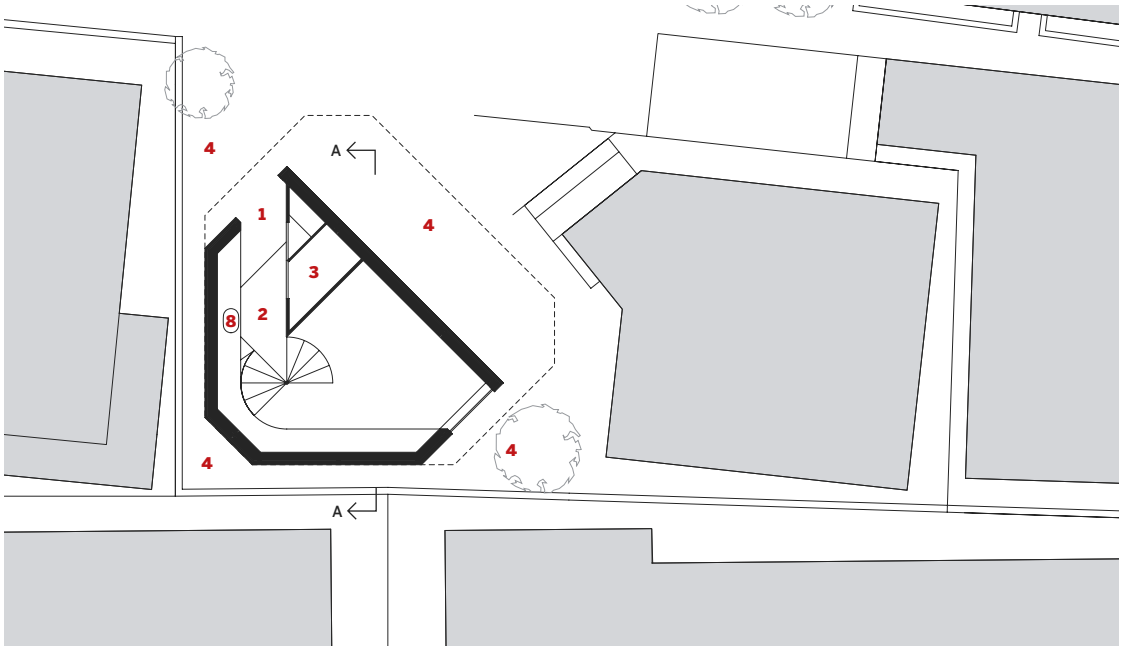
HISTORICALLY, solid walls that simply shut out the surroundings were a common coping mechanism for building on tight and unpredictable sites in Japan. But, nowadays, a number of designers are much more willing to connect their works to proximate buildings and urban-planning quirks. Breaking rank with the boxy dwellings dotting their central-Tokyo neighborhood, architects Takaaki and Yuko Fuji created a cork-clad octagonal house with triangular pocket gardens that insert much needed breathing room into the congested urban fabric. By prioritizing the siting of their building as well as its volume, the architects realized their dream home and became good neighbors too.

The house's unusual massing results from an off-the-rack digital-simulation program that enabled the architects to explore possible building shapes and site orientations as well as microclimate conditions. Unsurprisingly, their 474-square-foot parcel, a subdivision of a larger plot that previously held a two-story apartment building, came saddled with challenging size restrictions and setback requirements. In addition to maximizing their space, the designers wanted to reduce their dependence on mechanical climate control and minimize the impact on the houses surrounding the site on three sides. Since lots in Tokyo can be very small, the views, ventilation, and privacy of existing homes are frequent casualties of new construction next door. Positioned at a 45-degree angle in relation to the 7½-foot-wide public pedestrian walkway—the site's only access—their atypical, eight-sided volume handily achieved these goals.



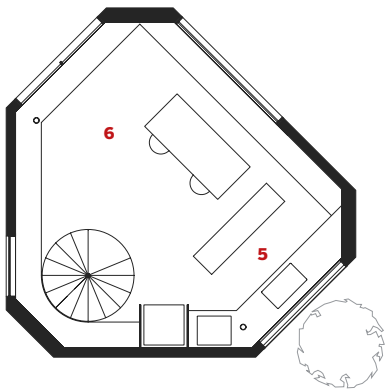
ON THE fourth floor, a picture window frames a wash basin (left). Adjacent to the glazed front door is a very small parking spot, which helps to open the public pathway (opposite).



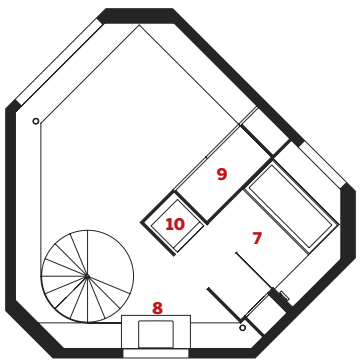


1 ENTRANCE
2 FOYER
3 POWDER ROOM
4 POCKET GARDEN
5 KITCHEN
6 DINE / LIVE / WORK
7 BATHROOM
8 WASHSTAND
9 CLOSET
10 LAUNDRY
11 SLEEP / PLAY SPACE
12 ROOF TERRACE

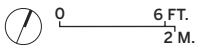
GROUND-FLOOR SITE PLAN

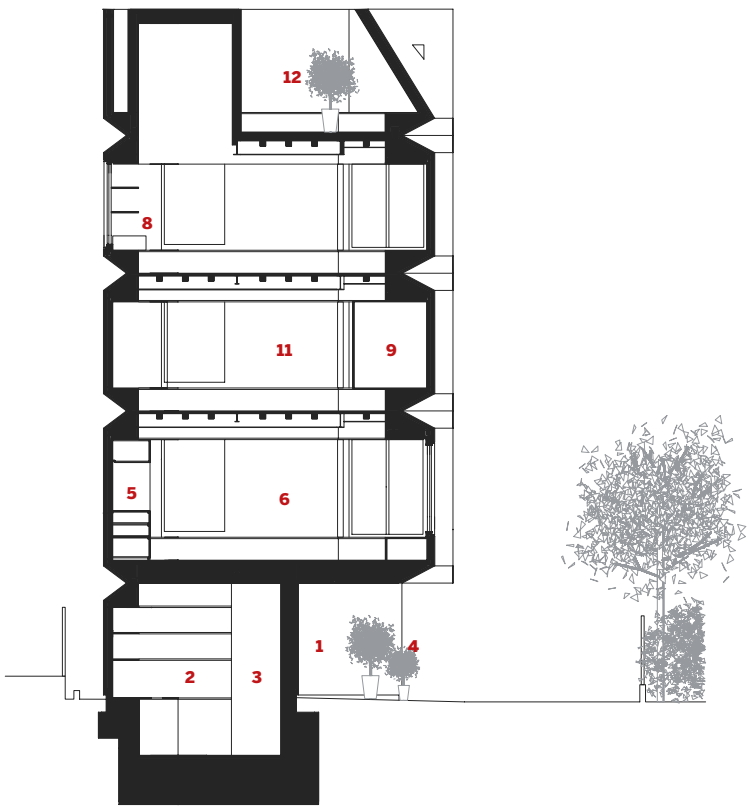


SECOND-FLOOR PLAN



FOURTH-FLOOR PLAN





SECTION A - A

A WALL of custom shelving at the entrance is illuminated by portable steel-encased lamps designed by the architects (right). Stainless-steel walls enclose a powder room opposite.

While the architects could have gone with a conventional rectangular footprint, slicing the corners off their allowable building mass also enabled them to swap floor area for additional height. Connected by a spiral stair, the four-stories of the house (plus roof terrace) mainly contain multipurpose spaces—a traditional Japanese planning strategy born anew. The only fixed programmatic areas are a powder room on the ground floor, combined kitchen, dining, and living area on the second floor, and a bathroom on the fourth. Even function-specific furniture is limited. Instead, futons convert the fourth floor into the family's sleeping area, and a host of built-in elements—such as bookshelves, storage bins, and seating—can accommodate activities as various as writing, eating, playing, and designing buildings for their joint practice. (In addition, Yuko and Takaaki have day jobs as architects at Taisei Corporation and at Mitsubishi Jisho Sekkei, respectively.) By championing flexibility, the architects aim to avoid the common pitfall of purpose-built rooms falling into eventual obsolescence, while making highly efficient use of every inch in the here and now.

Another way that the architects enlarged their living area was by treating all eight sides of the building as "bay windows," which are exempt from floor-area-ratio calculations in Japan. Jutting out 16 inches from the building's permissible footprint and articulated with angled exterior cuts, the massive, cork-covered planes incorporate both solid and transparent sections to modulate the interior climate and protect privacy. While traditional operable windows admit daylight and air, triple-layered operable panels integrated into the cladding enhance natural ventilation. Made of the same cork, backed by wood and heat-resistant glass (to block unwanted heat), they can be opened to let in fresh air without solar gain. The carefully positioned glazing also "edits" the surroundings while framing a variety of outside scenes, from intimate glimpses of the walkway at grade to sweeping panoramas of the Tokyo cityscape from the fourth floor. "The view outside gives each floor a distinct character," comments Takaaki Fuji.

According to the architect, the "bay windows" are also key elements of the structural system. Due to the narrow accessway, large machinery, including pile drivers, could not



be brought on-site. Instead, construction materials had to be hand carried, and a lightweight steel frame, supported by concrete-mat foundations, was erected. Encased with steel, the bay windows counter horizontal and seismic forces. This reduced the size of load-bearing vertical members, both a weight and space-saving measure. Coated with silver paint dusted with a shimmery powdered mica, the exposed metal frame is a defining feature of the interior, complementing the oil-finished teak flooring and lauan-plywood walls and ceilings.

Outside, it is the 2-inch-thick carbonized-cork cladding that accounts for the house's distinct appearance. A material that first caught Takaaki Fuji's eye while visiting an Álvaro Siza building, the treated cork is not only sustainable, rot-proof, and lightweight, it is also a good insulator because of its porosity. Though Japan produced the material in the 1950s as refrigerator insulation, before foam-board was invented, cork is no longer domestically available, requiring the architects to import the material from Portugal. Over time, Fuji anticipates that the chocolate brown covering will gracefully go gray. "A house ought to age well," Fuji explains.

Named for its unique form, the Fujis' residence seems on a trajectory to do just that. In Japan, few homes last more than 30 years. Due to the architects' choice of timeless, durable materials, their creation of flexible space, and the building's thoughtful siting within its context, the Bay Window Tower House ought to well exceed that norm. ■





THE FOURTH-FLOOR basin sits outside the bathroom for quick washups (above). Built-in seating and cabinets minimize furniture needs in the live/work/dine space (left). A roof terrace is concealed by 7-foot-high walls (opposite).

Credits

ARCHITECT: Takaaki Fuji + Yuko Fuji Architecture

ENGINEER: Tomonori Kawata (structural)

CONSULTANTS: Atsushi Mitsui (lighting design); Kensuke Hotta, Akito Hotta, Xiao Yahan (environmental)

CLIENT: Takaaki and Yuko Fuji

SIZE: 908 square feet

COMPLETION DATE: February 2020

Sources

CLADDING: carbonized cork

WOOD: teak (flooring); lauan plywood (walls and ceiling)





Open and Shut

On Great Barrier Island, Herbst Architects reimagines the classic New Zealand beach shack with movable layers that can be deployed to let in the breeze or protect against harsh weather.

BY JOHN WALSH
PHOTOGRAPHY BY JACKIE MEIRING

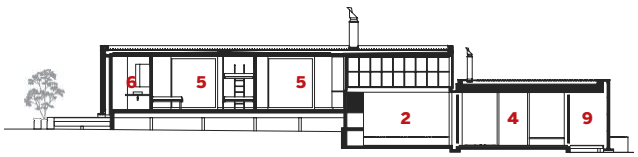


TWO RECTANGULAR volumes, perpendicular to each other and interconnected, comprise the house and step down with the site's slope.

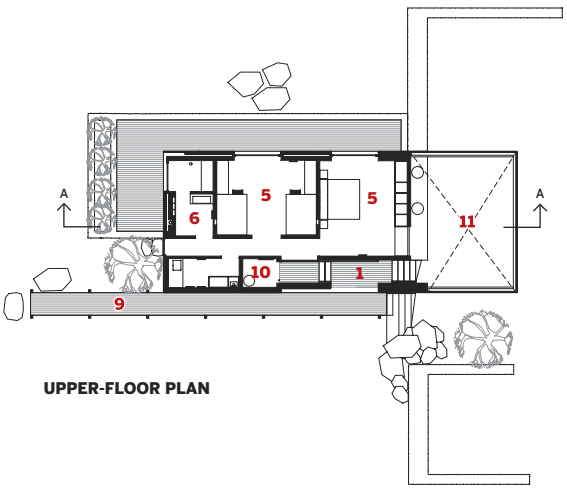
GREAT BARRIER—"the Barrier" or "the Rock," as locals call it—is a 110-square-mile island of steep hills, surf beaches, and sheltered bays 60 miles north of Auckland, New Zealand, at the edge of the Hauraki Gulf. To the indigenous Māori, who first occupied the island around 800 years ago, Great Barrier is *Aotea*, or White Cloud. It got its English title from the explorer James Cook, who landed on the island in 1769 and, in his stolid, Yorkshire sea-captain way, named it for its function as a 27-mile-long barrier against the Pacific Ocean.

Life on Great Barrier demands self-sufficiency. The island, two-thirds of which is a conservation park, is off the grid. Rainwater is collected in tanks, cell-phone reception is patchy, and groceries are shipped in every couple of weeks. In winter, storms cut Great Barrier off for days at a time; this March, a tsunami warning sent islanders hurrying to higher ground. Even in the third decade of the 21st century, Great Barrier remains remote—half an hour from Auckland in a small plane, over four hours on a ferry—and that's how its permanent residents, who number fewer than a thousand, prefer it. On the island, visiting the mainland is often described as going to New Zealand.

Distance, however, is no obstacle to the market for coastal real estate. In recent years, Great Barrier's modest dwellings have been supplemented by holiday houses designed by leading architecture practices, most prominently Auckland-based Herbst Architects. Over the past two decades, the office has designed 10 beach houses on the

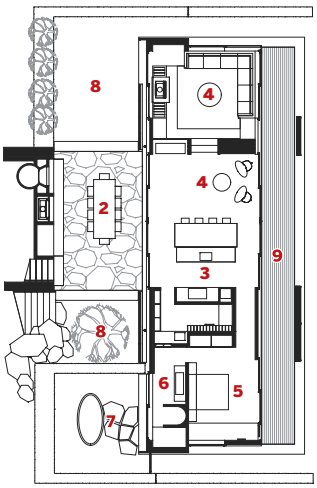


SECTION A - A



UPPER-FLOOR PLAN

1 ENTRY
2 LANAI
3 KITCHEN
4 LIVING
5 BEDROOM
6 BATHROOM
7 BATHING COURT
8 OPEN COURT
9 COVERED DECK
10 POWDER ROOM
11 OPEN TO BELOW



LOWER-FLOOR PLAN 0 15 FT. 5 M.





island—including the one for the firm's founders, Lance and Nicola Herbst—and in doing so has developed its own take on a building type with strong cultural resonance.

Historically, architecture ceded the New Zealand beach to the "bach," a type of vernacular cottage. Although fast disappearing, the bach is still idealized for the simple lifestyle it represents—in the local imagining, it's Adam's house in Paradise. For architects designing a Great Barrier beach house, the challenge is to evoke the bach's relaxed spirit while meeting the expectations of affluent clients.

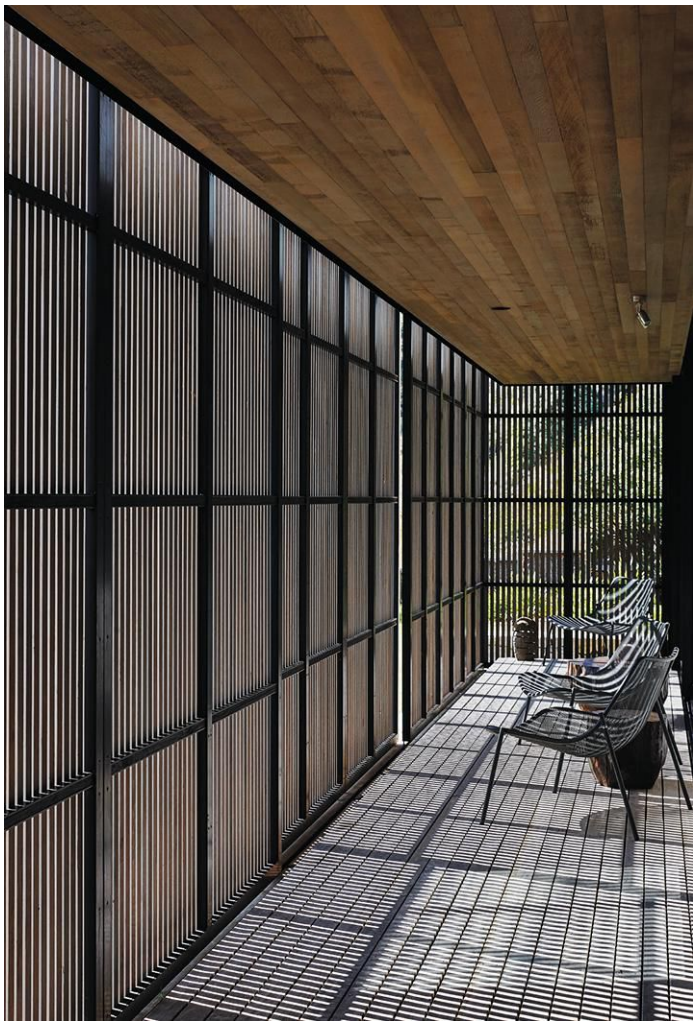
The Awana Beach House is the latest in Herbst Architects' series of







THE RESIDENCE, which can be almost entirely opened up to its surroundings through sliding windows and cedar screens and battens (above), is approached from a covered boardwalk (opposite). The house's two wings are linked by the lanai (left, center of photo), a 1½-story semi-outdoor space.





Great Barrier holiday homes. The house, designed for an Auckland couple with two young children, sits alone in the dunes above a public beach. In the design, the architects implemented their now-familiar beach-house strategy of layered protection, an approach that deploys screens and shutters to achieve a balance between shelter and privacy, on the one hand, and connection to the site and wider context, on the other.

Including the covered front deck and entry boardwalk, the steel-framed house is 3,440 square feet in area. A separate 640-square-foot garage houses batteries for storing the power produced by rooftop solar panels, as well as a backup generator. (Last year, the generator was needed for only 60 hours.) On a concrete pad, two single-story rectangular forms meet like the top and tail of a T. The concrete living wing runs roughly north–south, facing the beach; the timber-framed bedroom wing is aligned east–west behind it and, like the adjacent boardwalk, is elevated 6 feet to accommodate the slope of the terrain.

The house's wings intersect in the "lanai," a 1½-story volume central to the plan and the program. This covered courtyard, with a fireplace allowing year-round use, opens on its north and south sides, bringing the outside in. Herbst Architects' beach houses have always presented plenty of options for physical engagement with the natural environment. At times, these suggestions could be quite pointed: in early Herbst houses on the Barrier, a trip to the loo might mean a dash through a downpour. Nowadays, clients requiring greater amenity are unlikely to seek such an adventure. The Awana Beach House offers sensory experience through material specification—sections of board-formed concrete that give texture to the kitchen, living space, and lanai; the eucalyptus pilularis that lines the ceilings; and the pale timber of the native tawa tree used as flooring.

What utterly separates this beach house from any bach is its detailing, exemplified by the tracking system, in aircraft-grade aluminum, for the sliding doors, shutters, and banks of cedar battens. These weathered gray screens, 10½ feet high, extend from the floor to the building parapet, providing a first line of weather defense and enabling the house to blend in with its surroundings and defer to the Barrier's unflashy sensibility.

"We didn't want heroic modernism," Lance Herbst says, "but a house that is low, recessive, and designed to be viewed when closed down—a house demanding in its detailing, not its form." The contractor, who



THE PALETTE of materials, including board-formed concrete elements in the kitchen (above) and the living space (opposite), eucalyptus pilularus ceilings throughout, and the cedar battens and screens that protect a beach-facing deck (left, both) and all of the apertures, provide rich textures.

has worked on the island for more than 30 years, often with these architects, knew what to expect. "The Herbsts are very particular," says Great Barrier Building Company's Johnny Scott, with a builder's diplomacy. "But I do like working with them." ■

John Walsh is the author of four books on New Zealand residential architecture, and is a former editor of Architecture New Zealand *magazine.*

Credits

ARCHITECT: Herbst Architects — Lance Herbst, design architect; Nicola Herbst, co-design architect; Jimmy Gray, assistant architect

CONSULTANTS: Sullivan Hall (structural); Simone Crowe (interiors); Second Nature (landscape)

GENERAL CONTRACTOR: Great Barrier Building Company

SIZE: 3,400 square feet

COMPLETION DATE: February 2020

Sources

SLIDING DOORS: APL Magnum

MOISTURE BARRIER: Pro Clima

ROOFING: ColorCote, Viking

HARDWARE: Chant

CUSTOM MILLWORK: Aveora

PAINTS AND STAINS: Dryden, WOCA

CERAMIC TILE: Bisazza





Having It Both Ways

Bates Masi + Architects' Long Island house astutely combines the modern and the traditional, incorporating unexpected materials, from weathering steel to terra-cotta to thatch.

BY SUZANNE STEPHENS

WE WHO assemble Record Houses each year could be accused of having a penchant for the "box on the rocks"— a modernist, Miesian volume with elegant proportions and impeccable detailing, perched on a craggy cliff. The tension between a rugged landscape and the taut planarity of the flat-roofed form can be irresistible. But we know there is more.

Take the year-round house designed by Paul Masi, of Bates Masi + Architects in East Hampton, Long Island, for a family in nearby Amagansett: it stands out as a modernist residence in its open plan and glass walls, but it successfully mixes those elements with traditional or vernacular motifs such as gable roofs and spacious barnlike enclosures.

A cluster of three connected pavilions, 6,300 square feet in all, the design shows a clarity of expression developed with inventive flair through the use of natural materials, even unexpected ones. To be sure, the architect relies on a well-known batterie de cuisine for high-end construction: Douglas fir framing, cedar shingles for exterior walls and

THREE PAVILIONS with steep gables (left) create a clustered compound for a family in Amagansett, Long Island. Cedar shingles, terra-cotta tiles, thatch panels, and weathering steel can be seen at the entrance to the main pavilion (below).

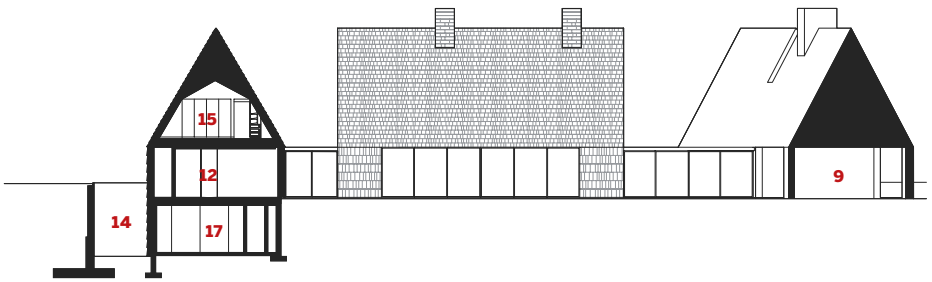
roofs, white oak for floors, interior walls, ceilings, and stairs. Yet the weathering-steel plate for elevated planting beds is unusual, as are the mottled copper-toned terra-cotta shingles employed not on roofs but on some exterior walls, as well as on a freestanding fireplace chimney inside. On top of that, Masi has introduced panels of thatch on wall surfaces both inside and out.

In the early 20th century, thatch, associated with old English cottages, was occasionally faked in picturesque houses in the area by the intricate layering of cedar roof shingles to create that effect. But Masi wanted real thatch for some walls because of its natural texture. "My choosing thatch actually wasn't an architectural decision," he says when asked if he was alluding to thatched roofs of yore. "I became interested in it because of the pastures



PHOTOGRAPHY: © PAUL MASI

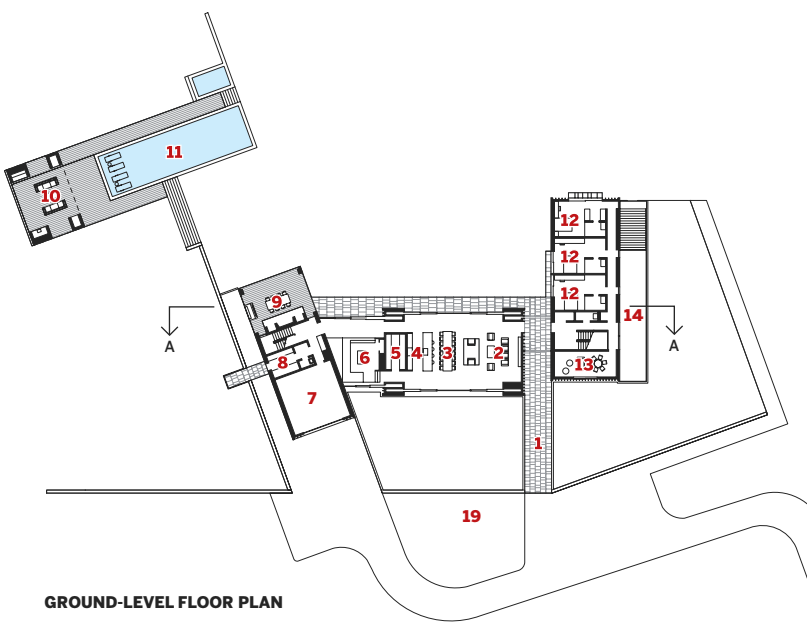




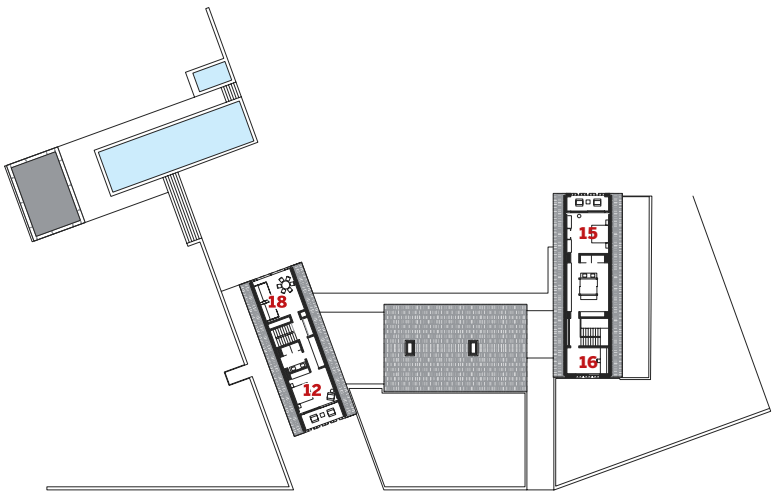
SECTION A - A

0 15 FT.
5 M.

1 ENTRANCE
2 LIVING AREA
3 DINING
4 KITCHEN
5 PANTRY
6 FAMILY ROOM
7 GARAGE
8 MUDROOM
9 OUTDOOR DINING
10 PERGOLA
11 POOL
12 BEDROOM
13 KIDS' ROOM
14 LIGHTWELL/ COURTYARD
15 MAIN BEDROOM
16 OFFICE
17 GYM
18 SLEEPING PORCH
19 PARKING



GROUND-LEVEL FLOOR PLAN



UPPER-FLOOR PLAN

0 30 FT.
10 M.



THE COMPOUND is oriented to a lawn on the west (opposite). Thatch panels appear on exterior wall surfaces (above) and at the interior entrance (right).



surrounding the house and knowing that phragmites (tall reeds) are plentiful out here." Still, he had to go as far as Ohio to find a thatcher who could produce the shaggy panels, set within steel bars.

The attraction of the pasture and easy access to the outdoors determined much of the design for this three-acre property. Since the clients, Jon and Janice Hummel, like to entertain, and their young daughters frequently have friends over, Masi arranged the pavilions so that the main structure, for living, dining, and the kitchen, occupies the center and is flanked by one containing the family's bedrooms, gym, and spa, to the north, and to the south by guest quarters, where an outdoor entertaining space is tucked underneath an open-air second-story sleeping porch. The structures all look out to a swimming pool at one end of a large lawn, and beyond to pastures that are preserved in a land trust.

On the front side of the compound, parking is shielded from the house by the raised beds of switch grass. As you walk into the glazed entrance vestibule in the main pavilion, the living area lifts expansively upward to the pitched roof, where the 16-foot-high terra-cotta-shingled chimney separates the living and dining spaces, and a panoramic view to

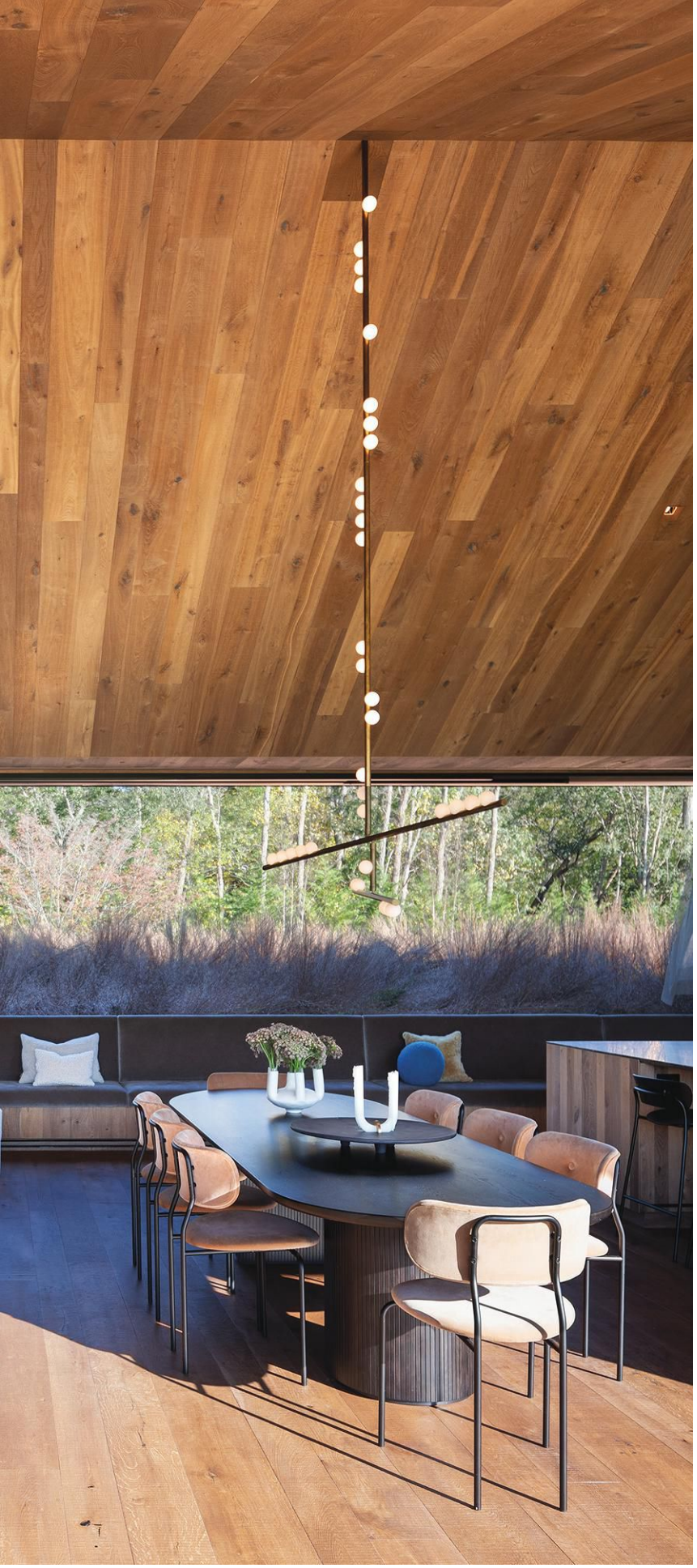




the lawn opens up through sliding glass walls. The main pavilion also contains the family room—a snug, a low-ceilinged alcove-like oak-paneled space defined by L-shaped built-in seating, where the Hummels like to gather.

Throughout the house, the deep pitch of the gabled ceilings—a throwback to traditional wood-framed architecture for assorted lodgings—continues to provide spatial drama. "The steep gables add height to the rooms, while the floors can act as collar ties for the structure," says the architect. A lightwell on the north end of the bedroom pavilion reminds you that Masi's idea of the vernacular can extend back to a feature used in ancient times: to admit daylight into the underground level of the pavilion, where a gym and other activity spaces are located, the architect carved a gap between its glazed walls and a 14-foot-high concrete retaining wall. The planted courtyard of the narrow lightwell, which is accessible from the recreation rooms and angles gradually up to the lawn, adds a surprising feature to the ensemble.

The high level of craft and detailing has been a hallmark of the architect since he became a partner of Harry Bates (now retired) in 1997 and began to earn a reputation for crisp wood-frame structures of





A FREESTANDING fireplace and chimney separate the living area (opposite) from the dining area (left). A 40-foot-long banquette extends through the living and dining areas to the kitchen (above).

both heft and elegance (Record Houses, April 2012, June 2017). "He knows his materials and how to use them," says Hummel, a particularly useful skill in the often harsh, damp, cold climate on the Atlantic shore of Long Island. Equally important, Masi is savvy about the top contractors in the area—and for this house, the builder is the client: Jon Hummel is a principal in the custom-home building company that his father, John Hummel, started in 1982, in East Hampton. In selecting his frequent collaborator as the architect for his own residence, Hummel emphasizes Masi's knowledge of building for all seasons, in a place where so much new construction is geared to summer houses. And Janice Hummel, the interior designer for her own house, found her sensibilities favoring a subtle color palette, natural textures, and simple lines were in close accord with Masi's.

At a time when so many houses are being built on the East End of Long Island that conflict with the landscape through jarring geometric



THE CEDAR-PANELED family room has an intimate scale (above); a steep gable gives the main bedroom drama (right). The oak stair unites the three levels in the bedroom pavilion (opposite).

exercises or mimic the context by cloyingly replicating villas and cottages of the past, it is gratifying to see an architect mix traditional and modern vocabularies with such supple dexterity and imagination. In its "both/and" approach, this house reminds us that there are rich and variegated alternatives to the box on the rocks. ■



Credits

ARCHITECT: Bates Masi + Architects — Paul Masi, design lead; Greg Scherer, job captain; Danielle Farrell, design team

INTERIOR DESIGNER: JL Hummel Interiors

ENGINEER: Steven L. Maresca (structural)

GENERAL CONTRACTOR: John Hummel and Associates Custom Builders

CONSULTANT: Marders (landscape)

CLIENTS: Jon and Janice Hummel

SIZE: 6,300 square feet

COMPLETION DATE: September 2020

SOURCES

TERRA-COTTA TILE: Petersen Tegl

WEATHERING STEEL: Peconic Iron

GLASS/WINDOWS AND SKYLIGHTS: Kawneer

DOORS AND METAL-FRAME WINDOWS, LOCKSET, PULLS: Arcadia

PAINTS AND STAINS: Benjamin Moore

LIGHTING: Q-Tran; Specialty Lighting



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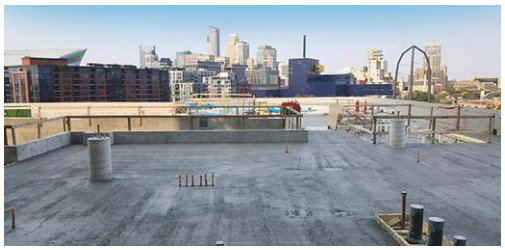


APRIL 7, 2021 | 2:00 PM EST

Vitruvian Principles Applied to Firm Management

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

BQE CORE ARCHITECT



APRIL 8, 2021 | 2:00 PM EST

Proactively Address Moisture in Roof Assemblies

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

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APRIL 15, 2021 | 2:00 PM EST

Record Houses Live

Architectural Record's annual Houses issue has been the premier showcase for residential architecture for decades, each year reflecting the best in inventive contemporary design. Now, for the first time, *Record* Houses will be live: come see and hear from the architects of 2021's award-winning houses, featured in the April issue of the magazine and online.

CREDITS: 1.5 AIA LU/ELECTIVE; 1.5 AIBD P-CE; 0.2 IACET CEU



APRIL 21, 2021 | 2:00 PM EST

Increase Quality and Reduce Liability in Your Projects by Specifying Qualified Labor

This webinar is part of the Natural Stone Academy.

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

NATURAL STONE INSTITUTE



APRIL 28, 2021 | 2:00 PM EST

Prioritizing Well-Being for a Healthier Built Environment

This webinar is part of the Health & Well-Being Academy.

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

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Seeds of Change

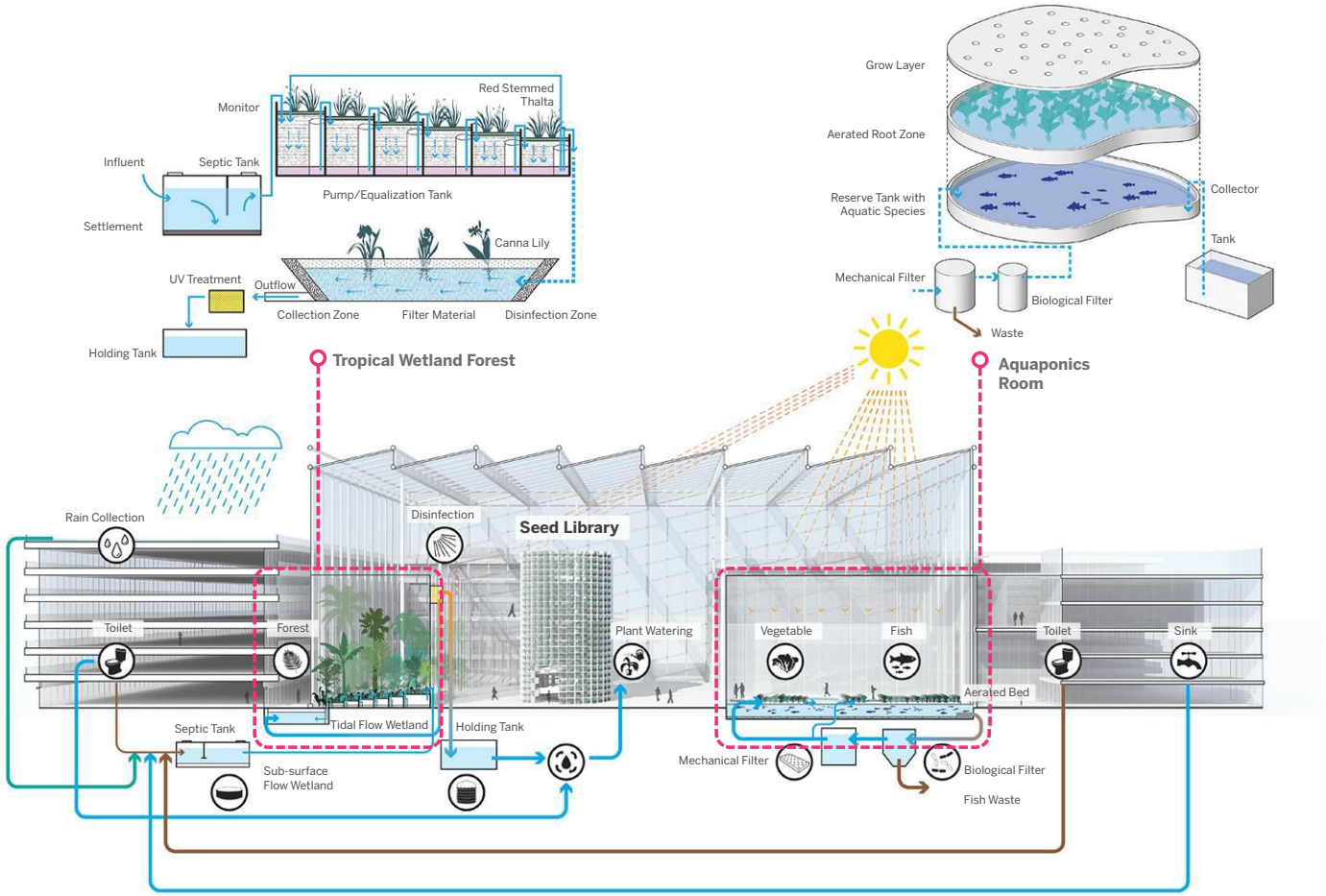
Architects and landscape architects are helping create new growing strategies to combat climate change, protect fragile ecosystems, and feed burgeoning populations.

BY KATHARINE LOGAN

IT'S BEEN 10,000 years since the agricultural revolution gave rise to cities. Agriculture now covers more than half of the world's habitable land, and is spreading at a rate of about 15 million acres annually. Cities, meanwhile, now comprise more than half the global population (over 80 percent in developed countries), and the numbers are rising. Using current farming methods to feed a global population expected to hit 10 billion by mid-century would require adding new farmland equal in size to the continental United States.

This alarming situation is not even factoring in the impact of the climate crisis, which is expected to alter growing seasons and disrupt the phenological cycles that keep plants and their pollinators in sync. What's more, new agricultural land mostly comes from felling biodiverse, carbon-sequestering forests to make room for mono-crops that stash very few greenhouse gases and for livestock that actually generate them. That makes the climate crisis worse, and farming more difficult.

In addition to land consumption, agriculture guzzles three-quarters of the fresh water used globally each year, while runoff from fields treated with herbicides, pesticides, and fertilizers contaminates significant amounts of the water that's left. Then there's transportation. As farms extend farther and farther from



DEMONSTRATION-GREENHOUSE DIAGRAM

SUNQIAO Urban Agricultural District, designed by Sasaki for a site midway between Shanghai's city center and its main international airport, will include a civic plaza with productive landscapes (opposite), a science museum, and an interactive greenhouse (above), among other elements.

the cities they supply, food is trucked, shipped, and flown vast distances: farm to plate, the ingredients in a typical American meal travel an average of 1,500 miles. From a security perspective, the fact that most of the world's food production is controlled by just a handful of corporations is unnerving. And from a public health perspective, the emergence of Covid-19 and other new diseases offers yet another indicator of ecological imbalance. It's time to rethink the way we farm.

Food security, as defined by the United Nations, means that all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that serves their food preferences and dietary needs for an active and healthy life. Key to achieving food security in a way that's more sustainable than current practices is urban agriculture—not as an outright replacement for rural farming, but as a crucial component in a balanced system.

Urban agriculture can take many forms: rooftop greenhouses, raised beds, and community-farming initiatives such as the City of Atlanta's "Aglanta" program, which turns underused parcels in utility rights-of-way into farm plots eligible for U.S. Department of Agriculture certificates and associated loans. Ultimately, though, horizontal strategies are not productive enough to make a real dent in the food needs of a city. (If raised beds covered every rooftop in Manhattan, the produce grown would feed only about 2 percent of the borough's population.) Just as cities grow vertically, so too must urban agriculture, and that means bringing it indoors.

"Controlled environments have been used for many years," says Chieri Kubota, a professor of controlled environment agriculture (CEA) in the Department of Horticulture and Crop Science at Ohio State University. "Now that multiple issues are making conventional production outdoors more difficult, putting controlled environments in and near cities brings food production closer to potential markets—and also to younger generations of potential farmers who want to live in urban centers."

Vertical agriculture is a type of CEA that—like high-rise buildings—stacks layers to provide usable area many times the footprint of the site. Instead of growing in soil, which is a heavy way to deliver nutrients, plants in vertical farms are grown hydroponically, aquaponically, or aeroponically. In hydroponics, plants are cultivated in nutrient-enriched water, which is captured and reused so that the system uses as little as a tenth of the water conventional agriculture needs. An aquaponic system pairs hydroponics with fish production, circulating the nutrients in the fish waste to feed the vegetables, and using the plants as a biofiltration system that returns clean water to the fish. Reducing water

IMAGES: © SASAKI

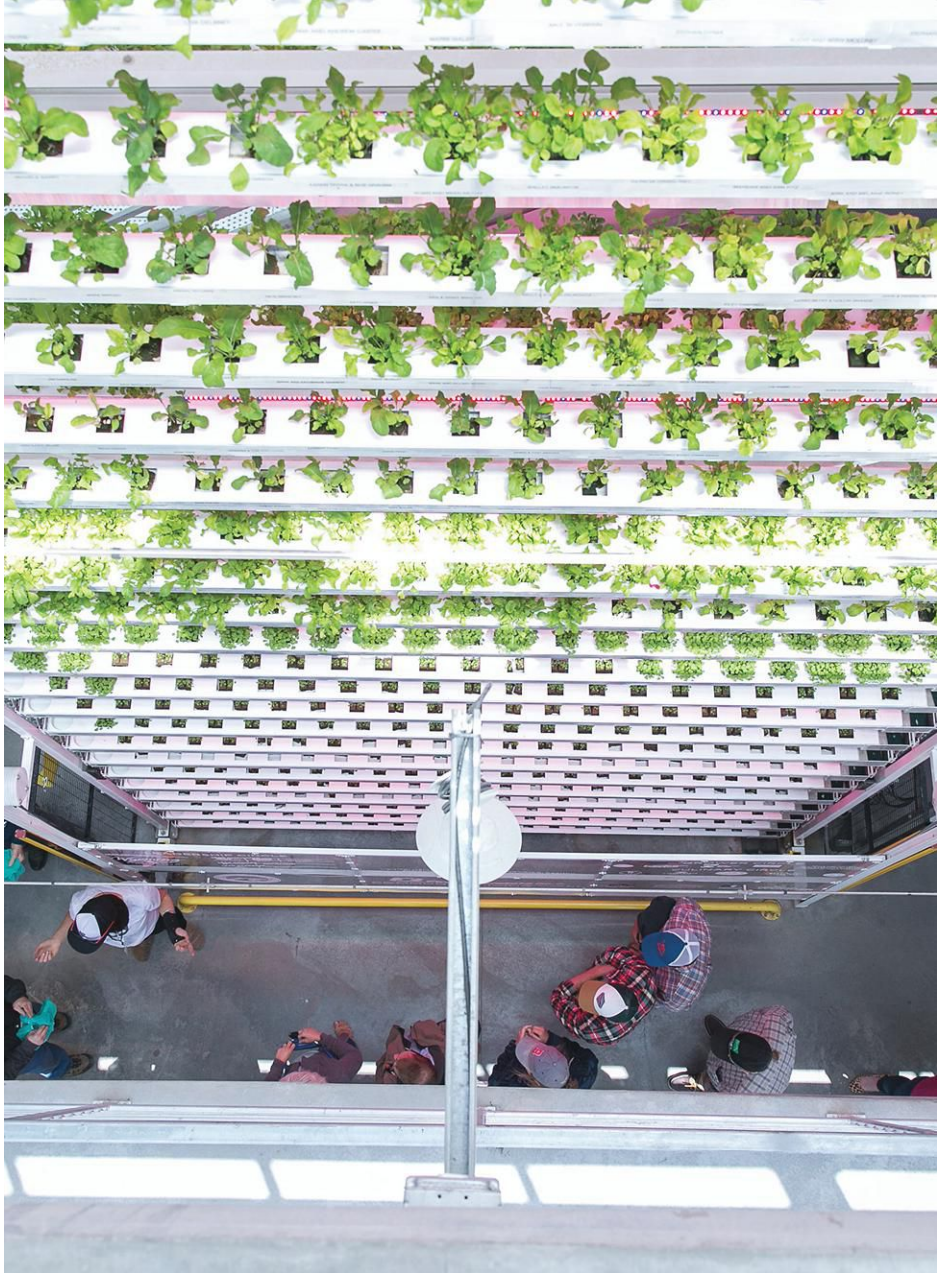


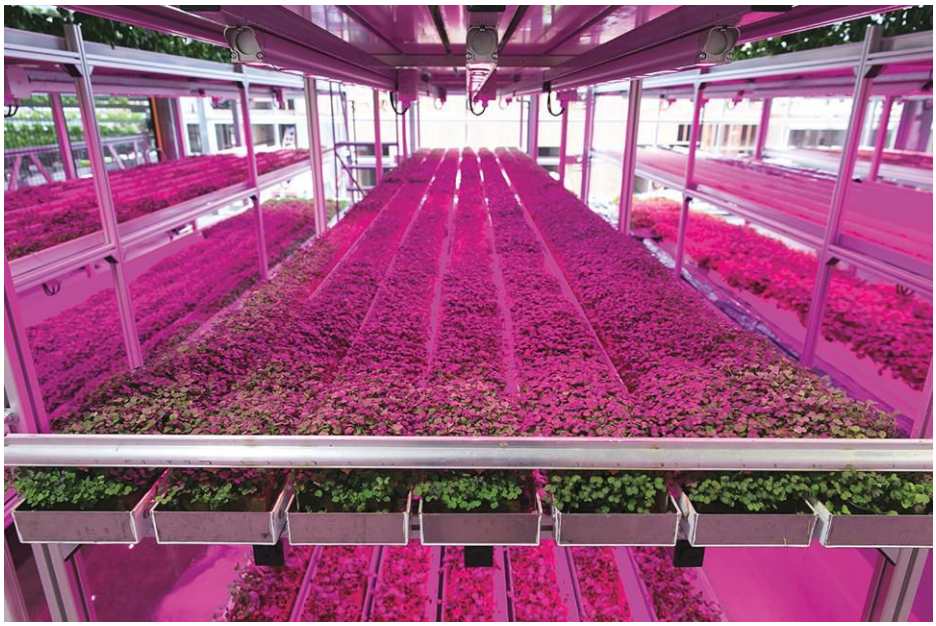
consumption even further—by as much as 98 percent, compared to field growing—aeroponic systems deliver nutrients in a fine mist to plant roots that are just hanging in the air. And because controlled environments exclude the weeds and pests that trouble field-grown produce, the use of herbicides and pesticides is all but eliminated.

Stacked plants may need to be rotated to make the most of available sunlight, which can be supplemented (or even substituted altogether) with LED grow lights. These can be calibrated to provide blue and red light in optimal doses for each type of plant, and timed to increase plant growth with extended days and growing seasons. (While it's technically possible to grow any type of crop this way, for now it's mainly leafy greens and tomatoes that are economically viable.) Cool enough to be strung right in among the plants without burning them, LEDs reduce site electricity consumption (and costs) per square foot of grow area by about a third compared to older technologies, such as high-pressure sodium. "Energy is a game-changer," says Dickson Despommier, an emeritus professor of microbiology and public health at Columbia University, whose seminal 2010 book, *The Vertical Farm: Feeding the World in the 21st Century*, is widely credited with kick-starting vertical agriculture in North America. Cost-effective LED lighting opens up the possibility of converting urban and urban-adjacent building types such as parking garages, big-box stores, and shopping malls into productive local farms, he says.

With productivity rates that are orders of magnitude greater than conventional farming, high-rise growing is gaining traction worldwide. The world's first such system began operations in 2012 in Singapore. The land-strapped city-state, which imports about 90 percent of its food, aims to grow a third of its produce locally by 2030. Indoor vertical farms in the country now produce about 80 tons of greens a year, and the Singapore Food Agency is supporting research into and development of the method as its main bet on the future.

In China, great swaths of arable land have been lost to development (more than 30 million acres between 1997 and 2008) and 20 percent of what's left is contaminated. At the same time, the country has a strong tradition of urban-adjacent farming. When a 247-acre agricultural site, midway between Shanghai's main international airport and the megacity's center, recently came up for redevelopment, global design firm Sasaki proposed that, rather than create yet another tech park, the client take its agricultural mission to the next level. As a result, the Sunqiao Urban Agricultural District is slated to become one of China's first comprehensive national agricultural zones. Sasaki's master plan, which has received approval from the Pudong District and is now proceeding for formal approval from the City of Shanghai, expands the district's role in Shanghai's food network, integrating vertical agricultural production, research, and education into a dynamic public domain. In addition to research and development facilities and an agriculture production





VERTICAL HARVEST'S three-story CEA facility (this page and opposite) in Jackson Hole, Wyoming, produces as much food on a tenth of an acre as on a 10-acre conventional farm.

zone, the plan provides for a civic plaza showcasing productive landscapes, a science museum, an interactive greenhouse, an aquaponics display, and a destination market. "It's urban agriculture on steroids," says Michael Grove, chair of landscape architecture, civil engineering, and ecology at Sasaki.

Grove identifies three primary drivers for prioritizing urban agriculture globally: the need to curtail agricultural sprawl and thereby protect ecosystems, to reclaim economic agency by diversifying control of food production, and to build community: "Food brings us together," he says. Behind Asia's early adoption of urban agriculture, he sees a historic understanding among the region's societies that the well-being of the population requires systemic support. That may also be a factor in Europe, where the Netherlands is a global leader in controlled-environment technology, and Denmark is home to the world's latest and largest vertical farm, a partnership between a Taiwanese CEA tech company and a local start-up: with growing shelves stacked 14 deep, the 75,000-square-foot wind-powered facility has the capacity to produce 1,000 metric tons of greens a year.

North America has been slower to adopt vertical farming, a lag that Ohio State's Kubota attributes in large part to the year-round, nationwide availability of produce from California, Arizona, and Florida. But now, she says, climate disruptions and shortages of viable farmland in those states, along with the increasing urbanization of the workforce, strengthen the rationale for controlled environment agriculture. To support Ohio State University's multidisciplinary research into CEA, a one-acre vertical greenhouse is under construction within sight of downtown Columbus. As part of the facility, the recently completed Kunz-Brundige Franklin County Extension Office serves as a hub for teaching, research, and community engagement around food, health, agricultural production, and sustainability. Both buildings are designed by Philadelphia-based Erdy McHenry Architecture.

Although still tiny, vertical farming is the fastest-growing sector in U.S. agriculture. A projected compound annual growth rate (CAGR) of more than 20 percent from 2020 to 2026 is expected to bring sales to around $10 billion a year. And while significant

PHOTOGRAPHY: COURTESY VERTICAL HARVEST (OPPOSITE); © HANNAH HARDAWAY



A HUB for teaching, research, and community engagement, located within sight of downtown Columbus and designed by Erdy McHenry Architecture, supports Ohio State's CEA efforts.

numbers of start-ups in the capital-intensive sector have failed—as indicated by the track record of several initiatives profiled in this magazine eight years ago (RECORD, August 2013)—experts say that's an inevitable aspect of an emerging technology.

Among the growing number of enterprises going strong, however, is Vertical Harvest, the first vertical hydroponic greenhouse in North America. Cofounded by architect Nona Yehia, principal at GYDE Architects, the company began operations in 2016 in Jackson Hole, Wyoming. Jackson is a rural town, but it performs like a city in relevant ways: 97 percent of its developable land is already in use, and, with a four-month growing season, 98 percent of its food is imported. Inspired by Despommier's work, the need for a local food supply, and the opportunity to provide meaningful work for community members with intellectual and physical challenges, Yehia designed a three-story greenhouse for a 30-by-100-foot municipally owned lot next to a parking garage. "The town councilor who showed us the property thought we'd put up a plastic hoop structure to extend the growing season a couple of months, employ a few people, and call it a day," recalls Yehia. But she and her business partners wanted to grow as much food as possible, to employ as many people as possible, and to do both year-round. "That's where the idea to grow up came from," she says.

With a footprint of a tenth of an acre, the greenhouse produces as much food as would a 10-acre conventional farm. It employs 30 people, more than half of whom have a disability. And it's profitable. "It would have been easier as a nonprofit," Yehia says, "but we were committed to creating a replicable model that is not about charity: it's about empowerment."

After five years of operation, Vertical Harvest is ready to expand. Construction is scheduled to start this year on a second location that incorporates affordable housing and municipal parking in Westbrooke, Maine. The new 70,000-square-foot greenhouse is expected to provide the equivalent of 50 full-time jobs and to produce 1.3 million pounds of produce a year, supplying hospitals, corporate cafeterias, schools, chefs, restaurants, and caterers, as well as individual customers. "These ecosystems can put out a lot of food," says Yehia. "Making sure you have customers who can buy at scale is as essential to success as growing plans."

Vertical Harvest intends to build up to 15 farms in the next five years, with agreements already in place for projects in Philadelphia and Harrisburg, Pennsylvania, and Chicago, and discussion is under way for five other locations. Like the Wyoming and Maine projects, they will integrate social value and community engagement with their agricultural mission. "It's the perfect intersection to show what architecture can achieve in its social role in our communities," Yehia says. And while she has run Vertical Harvest as designer, entrepreneur, and urban farmer, it's entirely possible for architects to advocate for urban agriculture in their more usual role as prime consultants, coordinating the work of other experts.

As CEA picks up speed, the time may not be far off when every municipality will incorporate vertical farming into its civic infrastructure, valued the way public libraries and recreation centers are. "It should be something that we all expect to see when we go to cities," Yehia says: "infrastructure that grows food and futures, and bolsters the sustainability of the community." ■

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Learning Objectives

1. Explain how conventional agricultural methods contribute to climate change.
2. Define terms such as urban agriculture, controlled environment agriculture (CEA), and vertical agriculture.
3. Describe technologies relevant to CEA, such as hydroponics, aeroponics, and aquaponics.
4. Discuss how CEA can enhance food security and bring social value to underserved communities.

AIA/CES Course #K2104A

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The Largest Robotic Parking Systems in the World: Is the United States Ready for This?

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Natural Stone Fact versus Myth: Addressing Common Misconceptions

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Taking Control: Planning for Optimum Gym Systems

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- **BE** BUILDING ENVELOPE DESIGN
- **EM** ELECTRICAL AND MECHANICAL
- **IN** INTERIORS
- **LS** LIFE SAFETY AND CODES
- **PM** PRODUCTS AND MATERIALS
- **PMD** PRACTICE, MANAGEMENT, DIGITAL TECHNOLOGY
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By Peter J. Arsenault, FAIA, NCARB, LEED AP

Residential design and construction have benefitted from both tradition and innovation in the United States. Traditional design styles are embedded in American culture based on multiple cultural influences. Traditional construction methods are centered around wood framing and product types that originated in the 19th and 20th centuries. Building on this long-standing base, innovation has taken hold in many aspects of residential design and construction in the form of new construction systems, enhanced materials, and more sophisticated products. All these advances offer higher performance, better quality control, and more flexibility in design. In this course, we will look at three such innovations, including ways to turn roof areas into outdoor terraces, the sustainable use of natural redwood, and the use of high-performance glazed walls. Each of these innovations is discussed in some detail, with case studies provided for context.

ROOF TERRACES AND OUTDOOR SPACES

It is very common for homeowners or tenants of residential buildings to desire some connection to the outdoors as part of their living spaces. This has certainly been intensified

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Learning Objectives

After reading this article, you should be able to:

1. Identify the ways that outdoor roof decks and patios/terraces can be sustainably designed using adjustable, modular pedestal deck systems.
2. Assess the structural and energy characteristics that are a result of providing timber curtain-wall (TCW) systems with appropriate glazing.
3. Recognize the environmentally sustainable ways that redwood can be used in residential projects.
4. Determine the means to incorporate the principles presented based on project examples and case studies.

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during the COVID-19 pandemic with many people spending more time at home. This desire is in line with a sense of health and wellness too, since it is generally recognized that regular interactions with the outdoors can lower blood pressure, reduce stress, expedite healing, improve mood, and help with focus.

Recognizing this need for outdoor spaces, the residential design question becomes how best to achieve it. In low-density housing situations, yards and grassed areas are common, but so are decks and terraces. In higher-density, urban settings, the creation of outdoor spaces requires more design thought. In the quest for finding a suitable outdoor space, many architects look to a flat (i.e., low-slope) roof or terrace area on a multistory residential building. Of course, this presents the challenge of protecting the roof while still creating an appealing, natural outdoor space.

An innovative solution to this multifaceted challenge uses adjustable-height pedestals that sit on top of the roof membrane and allow the top surface to be leveled. Modular wood tiles or pavers then rest on top of the pedestals and allow rainwater to pass through the joints and down onto the roof. The complete system allows for an inviting, natural, level surface that protects the roof and creates a continuous, safe walking surface. The pedestals are used in a variety of spaces, such as balconies, rooftops, and on-grade applications. They can help transform underutilized outdoor spaces or otherwise wasted spaces into functional outdoor amenities, such as kitchens, bars, lounges, or garden areas.

Mark Fusco, LEED AP, GRP, who is the national sales manager for Bison Innovative Products, has witnessed this firsthand. He points out that architects have been incorporating more roof decks into their projects because of the availability of these systems. "Architects can now design and specify tested, innovative systems for raised decks, including rooftop decks, terraces, and other architectural features. Further, they can do so using maintenance-free adjustable pedestals and low-maintenance deck surfaces," he says.

DESIGNING MODULAR ROOF DECKS

Part of the appeal of a manufactured roof deck system is that it is typically based on a modular system of components. Such systems give architects the design flexibility to create unique and beautiful rooftop environments and outdoor spaces, all while controlling the budget. The primary components of such a system are as follows.

Deck Supports/Pedestals

Adjustable pedestals are the fundamental support system for the deck and have become recognized as one of the most labor- and cost-efficient methods of creating a level deck over a moderately sloped surface. The location of the pedestals is typically based on a modular layout that follows the size of the material used on the deck surface. Commonly, this is a 2-foot x 2-foot square grid, although many other sizes are possible as well. Adjustable pedestals are available in a range of heights and weight-bearing capacities to suit a variety of conditions or needs. Those decks carrying more weight or requiring more height to achieve a level condition will need a higher grade of pedestal.

Many commercially manufactured pedestals are made with high-density polypropylene plastic that is 100 percent recyclable. This material choice means that the pedestals are essentially impervious to common outdoor concerns, such as water, mold, and freeze-thaw cycles. As part of a gravity-based system (i.e., no roofing penetrations required), the pedestal supports protect the roof and waterproofing membranes below without causing damage or harm. Pedestal deck systems can also be utilized over any other structural surface, such as on bare structural decks, rooftop decks, existing plazas/terraces, compacted grade, pavement, pool surrounds, inside of water features, or even between green roof areas.

Deck Surfaces

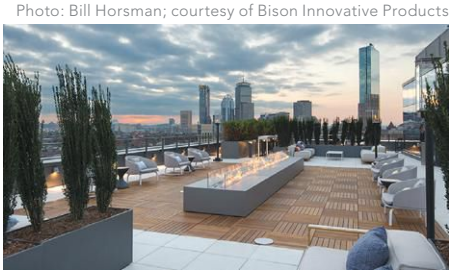
The versatility of adjustable pedestal deck supports means that they can be used to elevate a variety of decking surface materials. The common options include pavers made from concrete or stone, such as granite or travertine. Similarly, structural porcelain tiles, fiberglass grating, composite materials, or conventional wood decking systems can be used in a grid pattern to meet different design requirements. Typically, a galvanized steel paver tray is installed on top of the pedestals to support structural porcelain pavers or others. Surface materials can be removed for routine maintenance, repairs to the roof, or to gain access to other systems.

If a lighter-weight surface material is preferred or needed, wood tiles are a good alternative, as they weigh only one-third as much as concrete tiles. Typically made from hardwoods in a variety of species, wood tiles are commercial grade and available in standard, responsibly harvested, and Forest Stewardship Council (FSC)-certified hardwood options. If maintaining the wood color is desired, wood tiles can be periodically cleaned and sealed. Left to weather naturally, they will develop a silvery-gray patina.

Other Deck Design Options

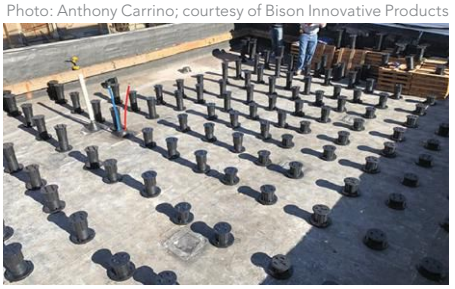
Green roofs are increasingly popular to expand usable roof space, add gardens, and control rooftop drainage. Designs that include green roofs typically demonstrate an imaginative use of materials that minimize maintenance and the environmental footprint of the building. By incorporating a pedestal system into a green roof, a pedestrian walkway can be provided, which keeps footsteps off the vegetation and allows it to grow properly. It also provides controlled access for maintenance of the green roof or other rooftop items.

Photo: Bill Horsman; courtesy of Bison Innovative Products



A roof terraces provides residents with a means to connect with the outdoors and can be designed as an appealing living amenity.

Photo: Anthony Carrino; courtesy of Bison Innovative Products



Adjustable-height pedestals are the first component to be installed in a standard modular grid pattern to suit the project's needs.

Photo courtesy of Bison Innovative Products



Outdoor balconies and terraces can use raised pedestal systems to support a variety of modular surfaces, such as the tiles shown here.


TIMBER CURTAIN WALL
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The cavity space created by the pedestals between the deck and the roof can be used strategically to allow for electrical wiring, recessed lighting, ductwork, and even irrigation. This means the deck itself or spaces below it can be serviced based on the needs of a project. This can also enhance the ambiance of the outdoor space and improve visibility and safety during nighttime and other dark conditions.

Of course, the deck does not need to cover the entire roof in any of these scenarios. It can be sized to suit the needs of the project such that it avoids other rooftop equipment or features, provides a geometry that is visually interesting, or is just sized to accommodate the programmatic needs of the space.

Site Furnishings

Modular wood cubes are available with an array of design options to incorporate seating, storage, and planters. Such cubes are available with a polyurethane lining and drainage holes to host plant life. At other times of the year, the cubes can be repurposed for seating and storage of seasonal items (i.e., cushions and pillows) by placing a manufactured hardwood top on the cube.

If a different look is desired, aluminum cubes are also an option. Designed to withstand temperature extremes, these low-maintenance, durable planters are constructed of lightweight, partially recycled aluminum. Some use an industrial strength powder-coated finishing process that is applied electrostatically and cured under heat, creating a more resilient finish than conventional paint. There are a variety of size and color choices available.

Overall, from reclaiming unused space in the city to creating a relaxing retreat in the suburbs or a luxurious oasis near water, pedestal rooftop decks can be a solution for a variety of residential designs, allowing for great flexibility and creativity. Further, through use of modular design components, an abundance of different design visions can be created that allow for quick and easy installation without the need for custom or costly materials.

VERSATILE REDWOOD DECKING

Outdoor decks and terraces of all types are popular on residences across the United States and Canada. For conventional, framed construction, there has been a surge of innovative decking products that are made from a combination of wood fiber and different types of plastic materials. These composite decking materials are sometimes selected and used based on an objective of finding a low-maintenance option that can blend with the residence and other deck components (e.g., railings, stairs, etc.). However, the plastic ingredients in these composite products raise questions about their structural performance (they are typically not as strong or rigid as solid wood) and their stability over time since they usually need plenty of room for expansion and contraction as their temperature changes. There is also the question of sustainability since the plastics are in fact petrochemicals that can contribute directly to negative environmental impacts.

This is a case where a traditional material is being looked at more closely as a preferred alternative compared to a newer, human-made one. That material is natural redwood decking, which is regarded as one of nature's finest and strongest building materials. Structurally, redwood has a shear strength up to five times greater than plastic and composite decking. From a durability standpoint, redwood is known to be naturally resistant to decay and termites. This was first discovered in redwood forests in California, where fallen trees were found to have been laying on the ground for decades with no visible sign of any significant decay—very unlike other trees that can decay naturally quite quickly.

Regarding the appearance, many designers agree that no other decking material mimics the natural beauty and warmth found in real redwood deck boards and accessories. Its rich, warm color and grain pattern look great when installed and maintains its appeal even with age. Redwood can be left untreated due to its natural resistance properties and allowed to patinate over time, or it can be stained or finished to preserve a particular color and look. Either way, it is a lightweight wood that is easy to work with, which helps control overall construction costs.

Redwood decking naturally achieves a Class B flame spread. This means it is approved for use in California's Wildland Urban Interface (WUI) fire-hazard severity zones without restriction. For situations where a higher degree of fire resistance is needed, it can be treated to achieve a Class A flame spread using proven and tested processes that are registered with building code authorities.

The design flexibility and performance characteristics of redwood decking mean it can be used in either renovation projects or new construction. Redwood decking also works well with innovative, newer deck components, such as glass panel railing systems or cable railings. The warmth of the wood complements a variety of the other materials, like glass and metal.

Photo courtesy of Humboldt Sawmill Company



Redwood has long been prized for its warm appearance on deck floors and ceilings, as well as its natural durability and longevity.

SUSTAINABILITY AND REDWOOD DECKING

For a period of time in the 20th century, there was a concern that different species of wood, including redwood, were being over harvested and their use was not sustainable. That concern has led to the creation of organizations like the FSC and others that have developed processes to ensure that wood as a natural resource is treated sustainably and responsibly. According to its website (www.fsc.org), "FSC is an international organization that provides a system for voluntary accreditation and independent third-party certification. This system allows certificate holders to market their products and services as the result of environmentally appropriate, socially beneficial, and economically viable forest management." For architects and building owners, this means that products that meet the FSC criteria are certified as a sustainable product.

The FSC offers several different types of certifications for companies that grow, harvest, process, and deliver sustainably produced wood, including redwood. These certifications include:

- **Forest Management Certification:** It states, "FSC Forest Management Certification confirms that the forest is being managed in a way that preserves biological diversity and benefits the lives of local people and workers, while ensuring it sustains economic viability." To receive FSC forest management certification, 10 principles must be adhered to by a forest operation. These principles include things like maintaining high conservation values, community relations, and workers' rights.



345 Harrison, Boston MA | architect: CBT Architects | landscape architect: Copley Wolff Design Group | photographer: Bill Horsman

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Photos courtesy of Humboldt Sawmill Company





Forest Stewardship Council (FSC) certification is one way to ensure that redwood products make their way from a sustainably managed forest all the way to a particular residential project (left). Environmental product declarations (EPDs) are used to communicate the life-cycle assessment (LCA) of different building products, including redwood.

There are also requirements for monitoring the environmental and social impacts of the forest being managed. Each principle has criteria that are the practical means of determining whether the principles are being complied with. These principles and criteria are applicable worldwide and usable in all kinds of forest ecosystems and most cultural, political, and legal settings.

- **Chain-of-Custody Certification:** FSC Chain-of-Custody Certification is a standard used to verify that materials harvested from a certified forest have been identified and separated from noncertified and noncontrolled material. This is important because wood moves through a supply chain, from the forest to the market, and can change hands and ownership multiple times along the way. Having a process to differentiate FSC-certified material from noncertified material helps ensure that the products used on a construction project are in fact sustainable. Hence, the FSC allows organizations of all sizes and types to have the opportunity to qualify for Chain-of-Ccustody Certification, including single site, multi site, and groups of organizations.

The certification process is an important step in verifying that wood products used in construction are in fact sustainable. Therefore, any design professional or homeowner concerned about the environment or those with a preference for all-natural materials are well served by specifying FSC-certified redwood.

Life-Cycle Assessment of Redwood Decking

The most accepted means of determining the overall sustainability of any building product is to conduct a life-cycle assessment (LCA) of the product. The Consortium for Research on Renewable Industrial Materials (CORRIM) in association with the California Redwood Association conducted a cradle-to-grave LCA on redwood decking in comparison to alternative decking products.

The LCA looks at the entire life of a building product, in this case redwood decking. It begins with the forest management (the "cradle") and moves through the harvesting, transporting, and processing into decking products ready for delivery (the "gate"). It continues with transporting to wholesale/retail outlets, delivery to a job site, installation, service life (the "use phase"), and finally to removal and recycling and/or disposal (the "grave"). Each of these steps in the life cycle of the product is assessed in five common impact categories, which include 1) Global Warming Potential, 2) Ozone Depletion Potential, 3) Acidification Potential, 4) Smog Potential, and 5) Eutrophication Potential.

Environmental Product Declaration

The results of the LCA are best communicated in a standardized format known as an environmental product declaration (EPD). The use of EPDs in the construction industry has become recognized as a means of providing total environmental transparency in building products so that architects, owners, and others can compare different products and make the best decisions on which products to use. What is the environmental performance of redwood decking versus other non-wood alternatives? Based on findings in the LCA and associated EPD, it is generally much better.

In the redwood decking LCA and EPD, a significant environmental advantage is accounted for. Since redwood trees, like all other trees, consume carbon dioxide and emit oxygen, they naturally sequester carbon dioxide and thus remove it from the atmosphere. This directly helps to offset the global-warming issues caused by excess carbon dioxide emissions from other sources. As such, it is common to see wood products, including redwood, listed in an EPD with a negative number for global-warming potential. In fact, the amount of carbon stored in redwood decking is equivalent to about 10 times the total carbon dioxide emissions released during the manufacturing process.

Regarding the other impact categories, redwood performs favorably as well, particularly compared to other building products such as composite or petroleum-based plastic decking. Low carbon emissions during the

Cradle-to-Grave Impact Assessment Results: 1m³ Redwood Decking						
Impact category indicator	**Unit**	**Total**	**Cradle to gate**	**Delivery to customer**	**Use phase**	**Landfill**
Global-warming potential	kg CO_2 eq.	-460	-648	41	0.08	147
Acidification potential	kg SO_2 eq.	0.59	0.92	0.21	0.00	-0.54
Eutrophication potential	kg N eq.	6.09e-02	4.83e-02	1.38e-02	5.58e-04	-1.73e-03
Ozone-depletion potential	kg CFC-11 eq.	3.83e-06	3.82e-06	1.57e-09	5.63e-09	1.02e-09
Smog potential	kg O_3 eq.	26.8	19.3	6.8	0.0	0.7
Total primary energy consumption	**Unit**	**Total**	**Cradle to gate**	**Delivery to customer**	**Use phase**	**Landfill**
Nonrenewable, fossil	MJ	780	1424	559	2	-1195
Nonrenewable, nuclear	MJ	109	107	5	0	-3
Renewable, biomass	MJ	265	265	0	0	0
Renewable, other	MJ	98	96	0	0	0
Material resources consumption	**Unit**	**Total**	**Cradle to gate**	**Delivery to customer**	**Use phase**	**Landfill**
Nonrenewable materials	kg	2	2	0	0	0
Renewable materials	kg	383	383	0	0	0
Freshwater	L	646	395	0	251	0
Nonhazardous waste generated	**Unit**	**Total**	**Cradle to gate**	**Delivery to customer**	**Use phase**	**Landfill**
Solid waste	kg	0.629	0.629	0.000	0.000	0.000

Source: Environmental Product Declaration for Redwood Decking prepared by UL Environment for the American Wood Council and the California Redwood Association



Of all the materials you specify, Redwood may be the most beautiful and sustainable, derived from Forest Stewardship Council® (FSC® C013133) certified timberlands in Northern California.

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manufacturing process and carbon storage during the service life of a redwood deck are both positive environmental attributes that should be considered when selecting a decking product.

A summary of the results as shown in the EPD for redwood are shown in the table below. This data can be compared to other such EPD tables for other decking products to determine comparative differences. Note that the unit of measurement is one square meter of redwood decking.

Jessica Hewitt is the Director of Marketing at the Humboldt Sawmill Company in Scotia, California. She has observed that "Segments of the population, often those that have attained higher education levels, prefer more sustainable materials." As shown in the preceding paragraphs, redwood can help to meet this preference in beautiful, durable, and intelligent ways.

INNOVATIVE RESIDENTIAL FENESTRATION

In many contemporary buildings, residential or commercial, the use of large areas of glass are incorporated into the design. There are many different design reasons for this, ranging from the capturing of views, the creation of a dramatic space, visual connectivity to the outdoors, and the capturing of sunlight for solar gains in the heating season. The performance of these large, glazed areas is an equal concern to the design considerations, however, and there have been many innovative developments to improve on the traditional means of adding fenestration to buildings.

Typically, the most common means of adding glass and glazing to a residential design has been to use individual window products that are inserted into framed openings. While this is effective in many cases, there are size limits based on the materials used and the type of glass incorporated. Commercial buildings, on the other hand, have had other options available, particularly where fixed glass is preferred. These include aluminum storefront glazing systems and curtain-wall systems. A recent innovation by several window manufacturers has been to offer a similar choice for residential designs as well.

Residential Curtain Walls

Curtain walls are generally defined as non-load-bearing glass wall systems that hang (like a curtain) in front of or between floor structures. The framing is attached to the building structure and does not carry the floor or roof loads of the building. As such, curtain walls provide a means for glazing an entire single-story or multistory facade that may reach heights of up to 20 feet, depending on the design of the building. Curtain walls are usually front glazed over the support framing of vertical and horizontal members. They also incorporate a self-draining design and can be either prefabricated by a supplier or fabricated on-site from individual components.

Curtain walls have been used for decades on commercial buildings, and they have proven to be quite popular and perform very successfully. It is not surprising then that the same product engineering principles have been applied to create innovative residential curtain-wall systems. However, there are some notable differences between commercial and residential curtain walls, including:

- **Different expectations:** Curtain-wall systems for residential construction must be different from commercial use in terms of fit, finish, and aesthetics.
- **Operable fenestration:** A curtain wall for residential use should allow for multiple configurations of operating windows and doors as well as fixed glass.
- **Structural integration:** Residential curtain-wall systems can be designed for load-bearing applications, if required.

There are several beneficial characteristics provided by residential curtain walls that meet or exceed these differing requirements. First, curtain-wall systems can replace some traditional window walls that have individual windows that are mulled together. Mulled units have innate disadvantages such as increased weight, reduced glass area, and discontinuous connection points. Mulling on-site can also be difficult and require additional time and costs. Second, residential curtain walls provide cleaner, more streamlined aesthetics to home designs. The use of hidden connectors and continuous visible wood lengths allow for clean, finished joints. There is also the benefit of a cleaner, less-obstructed view.

Timber Curtain Walls (TCWs)

Residential curtain walls can be fabricated from a variety of materials, but one preferred approach is to use wood timbers as the supporting frame. This accomplishes several things. First, the wood provides a predictable material on which to base engineering and support calculations. Second, it provides the visual appeal of natural wood that is commonly used on the interior side of residential fenestration. Third, the wood material has better thermal performance than the use of an aluminum frame system.

Photo: Casey Dunn Photography; courtesy of LaRue Architects



Residential curtain walls are an innovative glazing option that builds on the success of commercial curtain-wall systems but with fabrication and detailing specifically suited to residential projects.

Timber curtain-wall (TCW) systems for residential applications are tailored to the specific requirements of each project by a fabricator using parts from a manufacturer. As such, every TCW is treated as a custom design that will go through a detailed shop drawing process to ensure that all the architectural and engineering specifications are met.

In designing and specifying a TCW system for a residential project, the following attributes are worth considering:

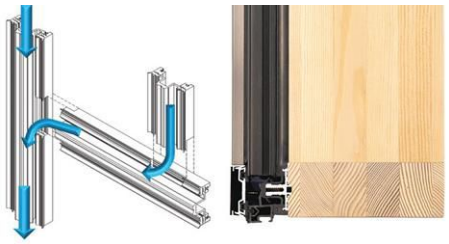
- **Engineering:** Engineering considerations need to be investigated when considering curtain-wall systems. Since curtain walls are one of the significant parts of a building's wall system, careful integration with adjacent elements such as floors, wall claddings, roofs, beams, and other building envelope components is critical.
- **Configurations:** TCWs can be fabricated to address vertical wall systems, sloped roof systems, and corner conditions. They can also incorporate any combination of fixed and operable window and door units, including casements, awnings, sliding doors, terrace doors, French doors, etc. The integration of operating doors and windows in a curtain-wall system should be visually seamless.
- **Factory preparation:** Residential TCW units can be factory assembled and hand-prepped for improved quality control. Timber connectors, gaskets, and glass carriers can be pre applied. Completed units are commonly predrilled, marked, and labeled. Each entire TCW unit is shipped in a knocked-down condition

Images courtesy of Loewen Windows and Doors





Timber curtain walls (TCWs) provide the aesthetics, strength, and environmentally friendly aspects of natural wood, and they can be protected on the outside with aluminum cover plates.



TCWs manage water through a carefully designed series of horizontal and vertical gaskets and seals that allow water to drain through the system, down to the bottom, and drain harmlessly away.

to the site ensuring accurate, easy assembly and field glazing. By comparison, conventional or stick-built curtain-wall systems require each horizontal section to be placed one after the other, with a high degree of quality checking and field precision necessary for the installation.

- **Timber material:** To ensure strength and resistance to warping and twisting, horizontal and vertical timber components should be either glue-laminated solid lumber or engineered-core lumber with finished facings. Transoms or horizontal rails are the horizontal members on the curtain-wall system. The mullions or vertical members are anchored to wood framing or a concrete slab. These components support the dead weight and wind loads of the curtain wall and transfer those loads to the building structure. The thickness of the timbers is commonly 2–2$^{1}/_{8}$ inches with a timber depth of 4–9 inches, although these dimensions will vary based on wind load and structural criteria. Specialty sizing for conditions such as corners, operating units, and custom widths can be designed and engineered.
- **Exterior cover options:** Since heavy-gauge extruded aluminum is most likely to retain its shape, resist denting, last longer, and be the most economical, it is the most common choice for an exterior cover to the TCW system. Aluminum covers can be part of a glazing system that holds the glass in place and allows for many different shapes, sizes, and extrusion profiles. It can also be finished in some commonly available techniques, including Class I anodic coatings (AAMA 611) or high-performance, factory-applied fluoropolymer thermoset coatings (AAMA 2605). These finishes are known for their excellent resistance to weather and environmental degradation. All coatings should be specified to meet third-party industry standards. While clad aluminum is the choice for a variety of reasons, wood cladding is an also an option for residential applications seeking that aesthetic. Exotic cladding options, including copper and bronze, are also available if desired.
- **Glazing options:** Glazing options for TCWs include a wide variety of glass and coating selections suitable for different climate zones or environmental concerns. These include monolithic glass, dual-glazed and triple-glazed sealed insulating glass units (IGUs), impact-resistant laminated glass, sound-attenuated glass, annealed glass, and tempered glass. The glass is also available with standard low-e coatings to improve energy performance.
- **Glass sizing:** Most glazed units are limited by maximum practical sizes for typical sealed-unit glazing, although this will vary based on the glass specification. Larger sizes may be available, but costs and time schedules can increase significantly, so consultation with a manufacturer is advised.

  For dual-glazed or triple-glazed units using 5.7-millimeter glass thickness:
  - Maximum area: approximately 60 square feet
  - Maximum short dimension: 72 inches
  - Maximum long dimension: 140 inches

  For oversized dual-glazed or triple-glazed units using 8-millimeter or 10-millimeter glass thickness:
  - Maximum area: can exceed 100 square feet
- **Water drainage:** In typical residential TCWs, there are no weep holes in the horizontal clad members. Weep holes can be undesirable visually, and water that drains through them can cause unsightly residue and discoloration from impurities in the rainwater. Instead, water that strikes a TCW is conducted through the exterior seal and gaskets to the base/sill where it can percolate and drain out. Water control is determined by the design of the connectors and the integrity of the gasket system. Two-level or three-level continuous EPDM gaskets with integrated drainage has become the industry standard.

Jon Sawatzky of Loewen Windows and Doors has worked extensively with TCW systems and notes, "Timber curtain walls can be structural or hanging, allowing many more design options. The exterior water-shedding system is integral and directs and channels moisture through the vertical cladding. They are robust enough to handle triple-pane and impact glass. In all, they meet a full variety of design and performance needs for residential projects."

CONCLUSION

Residential projects can take many forms, but they all can build on both tradition and innovation. Healthy, outdoor spaces, especially in urban settings sites, can be created successfully using adjustable-height pedestal deck systems over other surfaces, such as roofs or terrace areas. Stunning, appealing, and sustainable outdoor spaces can be created using properly harvested and processed redwood. Large areas of high-performance glass can be incorporated using TCW systems. Collectively, strategies like these can be used to create well-designed, functional, and sustainable residences.

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Rooftop Deck Systems

Manufactured in the United States with 20 percent post-industrial recycled materials, Bison Pedestals create level decks over sloped surfaces. They elevate and support wood tiles, pavers, site furnishings, and a variety of other surfaces. Bison Wood Tiles are commercial grade, constructed from sustainably harvested hardwoods, and available in standard and FSC-certified options.

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Humboldt Sawmill Company

Photo: Attilio Fiumarella



Redwood Decking

Native to California and widely used across the western United States, redwood decking remains one of the most popular natural wood decking materials available. Humboldt Sawmill Company offers FSC-certified redwood decking in 2-inch x 4-inch, 2-inch x 6-inch, and 2-inch x 8-inch dimensions, and in lengths from 6 feet to 20 feet.

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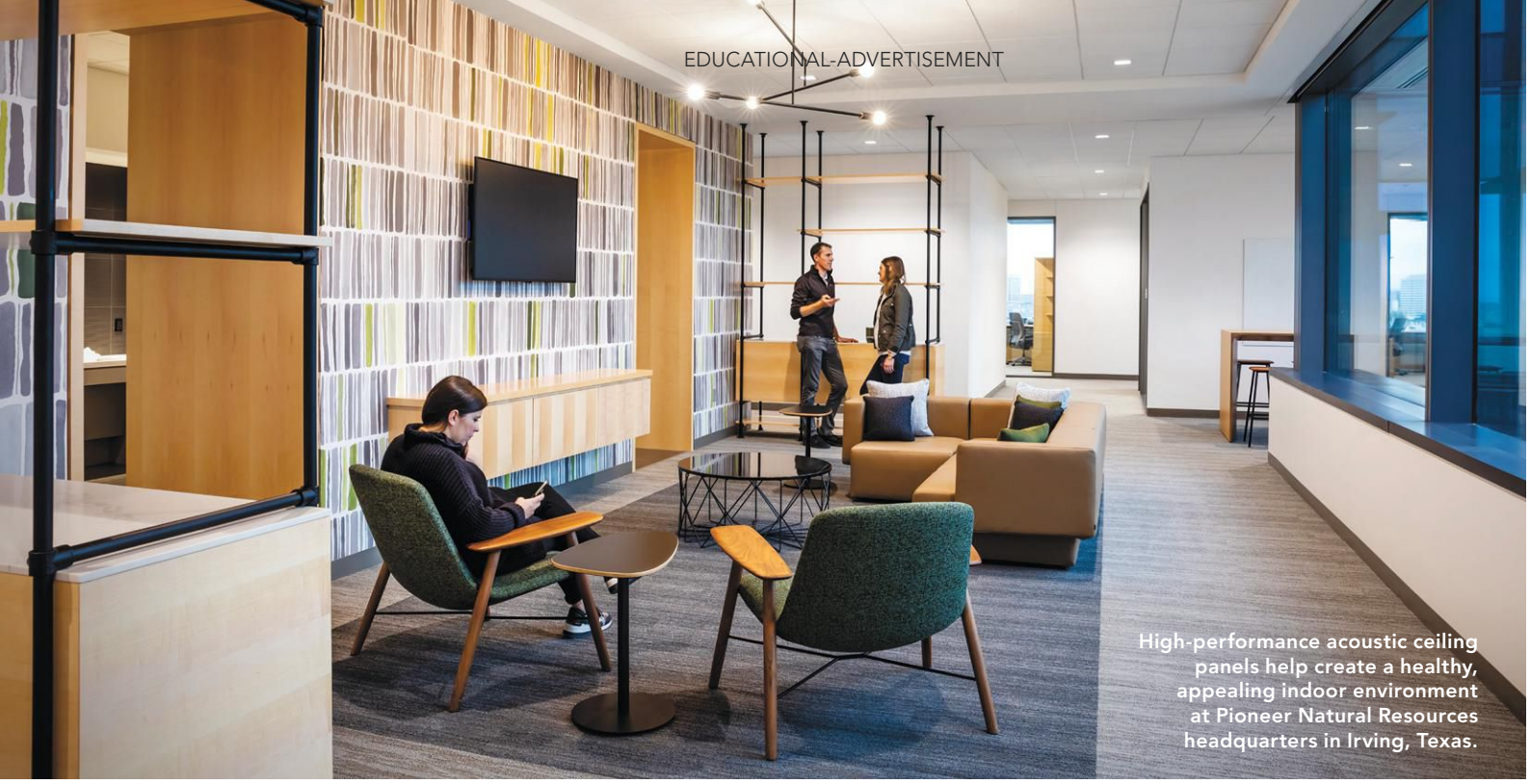
Photo: Casey Dunn



Timber Curtain Wall System

The Loewen Timber Curtain Wall system offers large glass assemblies with extremely narrow mullions. The structurally engineered timbers create a beautiful and warm interior, while the exterior covers are available in painted or anodized extruded aluminum, solid wood, or cyprium (copper or bronze cladding).

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High-performance acoustic ceiling panels help create a healthy, appealing indoor environment at Pioneer Natural Resources headquarters in Irving, Texas.

Photo courtesy of Corgan

Acoustic Performance in Buildings: Meeting the Standards

Understanding how interior ceiling systems address the four key components of acoustic standards and promote health and well-being

Sponsored by Rockfon | *By Juliet Grable*

Noise can impact the health and well-being of building occupants, and acoustic performance is a critical component of overall indoor environmental quality. In addition, investing in acoustic performance can yield long-term, measurable financial benefits, from improved performance and productivity to a better occupant experience. More and more building standards, guidelines, and rating systems require high sound absorption to reduce reverberation and control noise, providing speech intelligibility in assembly spaces, privacy in individual spaces, and comfort all over. However, there is at times a disconnect between these industry standards and best practices and what is implemented in actual buildings.

Continues at ce.architecturalrecord.com

Juliet Grable** is an independent writer and editor focused on building science, resilient design, and environmental sustainability. She contributes to continuing education courses and publications through Confluence Communications.* ***www.confluencec.com

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Learning Objectives

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

1. Describe how noise impacts occupant health and well-being in a variety of building types.
2. Compare and contrast some of the building standards, guidelines, and rating systems that include acoustics requirements, along with those that are specific to certain building types.
3. Discuss how meeting acoustic standards can translate into financial savings over the course of a building's life.
4. Identify the four major components of acoustic performance that are outlined in most standards.
5. Explain how stone wool ceiling panels, baffles and islands, and metal and wood ceilings can help comply with the acoustic requirements in standards, guidelines, and rating systems.

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

AIA COURSE #K2102B

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Rockfon provides customers with a complete ceiling system offering, combining stone wool ceiling panels with suspension grid systems, metal ceiling solutions, and now wood ceilings. Its products help create beautiful, comfortable spaces. Easy to install and durable, they protect people from noise and the spread of fire while making a constructive contribution toward a sustainable future. **www.rockfon.com**



All images courtesy of Robotic Parking Systems, Inc.

When it is completed, the New Palace of Justice located in Kuwait City, Kuwait, will contain the largest robotic parking system in the world with 2,433 spaces.

The Largest Robotic Parking Systems in the World: Is the United States Ready for This?

Sponsored by Robotic Parking Systems, Inc. | *By Kathy Price-Robinson*

Without a doubt, the United States likes to go big. We are the home of Mount Rushmore, Disneyland, and the Whopper. We are the birthplace of Apple, Google, Facebook, and Amazon. The movie industry grew up here. We are an economic and military powerhouse. The rate of entrepreneurship is staggering. We have big vehicles, big houses, and big dreams.

But with some emerging trends, we lag. This is the case when it comes to automated parking systems, which are robotic or automatic systems that park cars without human intervention using precisely calibrated machinery and software. These innovative parking systems save valuable urban space, create the highest use for land, increase ROI for developers, improve the environment, delight drivers, and are primed to mesh with future technologies. Research and Markets research firm estimated that the global market for automated parking in 2019 was $1.3 billion and forecasts the global market to grow to $3.6 billion by 2027.[1]

While automated parking technology and hardware are viable and readily available today in the United States, the biggest systems are located in other countries.

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1 GBCI CE HOUR

Learning Objectives

After reading this article, you should be able to:

1. Discuss the two largest automated parking facilities in the world: 1,191 spaces and 2,314 spaces, respectively.
2. Explain how robotic parking creates a healthier, safer, and stress-free experience for users.
3. Identify the factors that make robotic parking beneficial for environmental sustainability.
4. Define the significant land-use benefits and positive ROI of automated parking.
5. Describe how robotic parking relates to emerging transportation technologies.

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

AIA COURSE #K2104H



The Al Jahra Court Complex in Kuwait contains the world's largest automated parking system with 2,314 spaces.

The current honor of the Guinness World Record for the largest automated parking system with 2,314 spaces belongs to the Al Jahra Court Complex in Kuwait. Prior to this verified designation in 2018, the biggest automated parking system was Emirates Financial Towers (EFT) in Dubai with 1,191 parking spaces, which earned its standing in 2010. And soon, a new record holder is expected to be announced when the 2,433 spaces of robotic parking open in Kuwait at the New Palace of Justice.

Ironically, all of these record-breaking systems are made by an American company and manufactured here.

A History of Technology Advancing Architecture

Automated parking is gaining traction in the United States, though not nearly on the scale with which it is being embraced by architects and developers in other parts of the world. While having one's vehicle automatically transported and stored within a massive steel grid is unfamiliar to most U.S. citizens, other now-common technologies were once faced with the same unfamiliarity and resistance. Elevators, for instance, were suspect for many decades after they were introduced. Only a stunt by Elisha Graves Otis at the 1854 World's Fair in New York City, where he dramatically cut the cable of an elevator display, finally demonstrated to skeptics that an emergency brake system would prevent widespread death from elevator mishaps. Acceptance of the Otis elevator system is said to have made skyscrapers themselves possible.

When the developable space needed for parking cars is fully calculated, the acceptance of a system that can cut in half or thirds the space needed for parked cars could be revolutionary in terms of land use and even traffic issues. For architects, developers, and drivers unfamiliar with the innovation of robotic parking systems, it is helpful to take note of the largest of these installations and then examine the factors that led to their specifications.

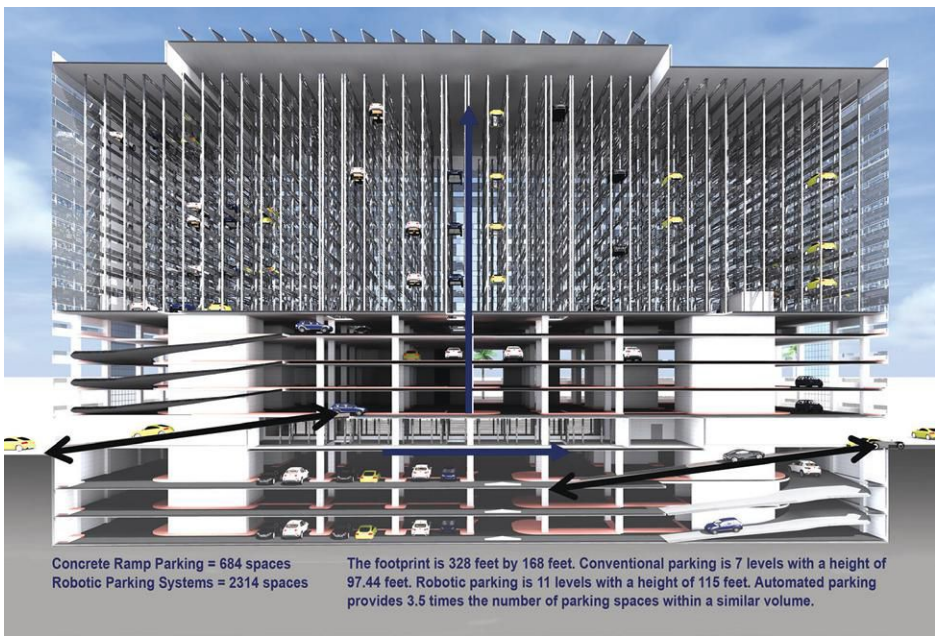
Al Jahra Court Complex in Kuwait

For the Al Jahra Court Complex in Kuwait—the current Guinness World Record holder for largest automated parking system—a U.S. company based in Florida with more than 100,000 square feet of manufacturing space was contracted for the project design, manufacture of the machinery, automation design, installation, startup of operations, and maintenance for the facility.

The parking facility was designed as a combination of conventional concrete ramp parking on the basement and podium levels, with the automated levels above the podium levels. The entire structure has a footprint of 325 feet by 168 feet, and both sections—conventional and automated—have approximately the same vertical height of 115 feet. However, while the conventional parking garage with ramps from floor to floor provides 684 parking spaces, the robotic parking system provides 2,314 spaces, or almost 3.5 times the number of parking spaces in approximately the same volume. This built project provides the starkest contrast of the space needed for each type of parking, and thus the advantageous ROI for developers who choose automated parking systems over conventional parking systems.

The automated parking structure is accessed by 12 grade-level entry/exit terminals. Peak traffic throughput (vehicles entering and exiting the terminals) is 425 cars per hour. That equals approximately seven cars per minute.

Continues at ce.architecturalrecord.com



The structure is a combination of conventional and automated parking.

Robotic Parking Systems, Inc.

Founded in 1994, U.S.-based Robotic Parking Systems, Inc. pioneered the development of the high-capacity, scalable automated parking garage. A robotic parking system reduces the space needed for cars by 50 percent or more. This creates more space for design and development. The speed and efficiency of the patented technology creates, for the first time, opportunities for projects requiring from hundreds to thousands of parking spaces to profit from the space-saving, environmental, and safety benefits of automated parking. **www.roboticparking.com**

Photo courtesy of Gallegos Corporation



The columns and cladding for the Ralph Carr Colorado Judicial Center in Denver are composed of granite.

Natural Stone Fact versus Myth: Addressing Common Misconceptions

Sponsored by Natural Stone Institute

Natural stone is a beautiful, durable, and sustainable material that can be used for a broad range of interior and exterior applications. Unfortunately, some design professionals are hesitant to specify natural stone, either because they are unfamiliar with the product or have questions regarding its maintenance requirements. In fact, when the natural right stone is selected for the right application and installed properly, it can perform for decades.

Natural stones are stones that have been harvested from their in-situ positions in the earth, then cut and machined into final products without alteration to the natural fabric of the materials. They may be cut into shapes, including slabs and tiles. Though a resin or sealer may be applied to the face, the internal fabric of the stone is unchanged. By contrast, engineered products that are made from aggregates bound together with cementitious or resin binders do not meet the definition of natural stone.

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Learning Objectives

After reading this article, you should be able to:

1. Compare and contrast the performance of natural stone to artificial materials used in similar applications.
2. Counter myths around natural stone regarding its cost, maintenance requirements, and sustainability.
3. Describe the resources and applicable test standards relevant to natural stone.
4. Explain how natural stone can satisfy green building goals and support overall sustainability of building projects.

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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This abundant and variable material defines many of the world's iconic buildings, both ancient and contemporary. The fact that some of these buildings have endured for centuries is a testament to the material's strength and resistance to wear. Dimension stone is cut or sawn into specific shapes. It can be finished by honing, polishing, or sandblasting, all of which affects the stone's appearance. Many types of natural stone, including granite, marble, and limestone, can be fabricated into thin panels and used on the exterior of buildings.

Versatile, beautiful, and durable, natural stone has long been mankind's preferred building material. The applications for natural stone are nearly limitless. Historically, stone served as the structure for many buildings; today, it is more typically used as nonstructural cladding. Natural stone is used extensively in landscaping, serving as pavers, walkways, walls, and other outdoor structures.

Inside, stone can be installed as flooring and countertops, as well as in vertical applications, such as wall cladding. Other options include mantels, fireplace surrounds, bath surrounds, and furniture.

How Natural Stone Is Classified

When specifying natural stone, it is important to have basic knowledge about the material's inherent characteristics; this way, you can choose the appropriate stone for the given application. The stone's mineral composition and how it was formed can tell you much about how it will perform.

Natural stone can be divided into two broad categories based on its chemistry, or mineral composition. Calcareous stones such as marble, limestone, and onyx are made of calcium carbonate and tend to be affected by acids, even common ones like lemon juice. Siliceous stones are made of silica or silicates and make up close to 95 percent of the earth's crust. They include such common minerals as quartz, feldspar, and mica. Siliceous stones tend to be strong and resistant to acids.

Natural stone also can be categorized by how it is formed. Sedimentary stones are formed from preexisting rocks or the bodies of once-living marine organisms. Metamorphic stones are created through a combination of heat, pressure, and time. Igneous stones have their start as molten material that originates from deep with the earth near active plate boundaries.

Specifying Natural Stone

The Natural Stone Institute recommends proper testing, specification, and installation of natural stone. To meet these requirements, design professionals should work closely with a quarry or distributor during the specification process. Also consider using fabricators and installers that have been accredited by the Natural Stone Institute, as they have been tested and audited on their craftsmanship abilities.

One of the most important resources for design professionals is the set of standards and testing procedures developed by ASTM International and the American National Standards Institute (ANSI). These standards guide the natural stone industry and help protect end users. In fact, most architectural specifications require that stone meet certain specified ASTM or other testing standards before it will be accepted for use.

Design professionals can seek test data from a quarry, material supplier, or fabricator. In addition, these experts will be able to provide anecdotal and historical information about the performance of a given material. They may refer you to projects that used the same stone in a similar application. For more information, visit bit.ly/2Q9gsBR.

	Sedimentary	Metamorphic	Igneous
Calcareous	Limestone Travertine Onyx	Marble	
Siliceous	Sandstone	Slate Quartzite Serpentine Soapstone	Granite Basalt

ASTM Test Standards

ASTM Test Standards relevant to natural stone can be divided into two broad categories: those that pertain to the stone's physical performance, and those that tell us something about how the stone will perform under certain circumstances.

ASTM C97: Absorption and Bulk Specific Gravity of Dimension Stone is the test method used to determine the absorption of water, expressed as a percent by weight, and the bulk specific gravity, which is the means by which density is determined.

ASTM C170: Standard Test Method for Compressive Strength of Dimension Stone is used for all dimension stone types, using a specimen that is a rectangular prism, cube, or cylinder. The compressive strength is reported as the failure stress in either lbs/in² or MPa.

ASTM C99: Standard Test Method for Modulus of Rupture measures the bending or flexural strength of a stone material under a single-point load.

ASTM C880: Standard Test Method for Flexural Strength of Dimension Stone evaluates bending strength using two points of loading and a sample that is the actual thickness of the stone to be installed.

ASTM C1353: Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform, Double-Head Abraser determines the degree to which a stone material can withstand scratching or abrasion using an instrument called the Taber Abraser.

ANSI DCOF (dynamic coefficient of friction) measures slip resistance of an object in motion and is relevant for flooring applications.

ASTM C1354: Strength of Individual Stone Anchorages in Dimension Stone evaluates the performance of individual anchors with a specific stone product.

Continues at ce.architecturalrecord.com

NATURAL STONE INSTITUTE

The Natural Stone Institute offers a wide array of technical and training resources, professional development, regulatory advocacy, and networking events for the natural stone industry. Learn more at **www.naturalstoneinstitute.org/stoneacademy**.



A custom programmed control system allows gymnasium setups to be changed quickly and provide a way for facilities to safely host more than one activity at a time, as shown here at Center Grove High School located in Greenwood, Indiana.

Photo courtesy of Draper Inc.

Taking Control: Planning for Optimum Gym Systems

Selecting the right gym equipment control systems for optimized operations

Sponsored by Draper Inc. | *By Barbara Horwitz-Bennett*

From high school gymnasiums to community recreational centers to collegiate athletic facilities, indoor sports are a major source of activity, physical education, exercise, and socialization within our schools and communities.

While high-quality basketball and volleyball equipment are essential for supporting safe and enjoyable classes, practices, and games, it is also important that facility managers can safely and efficiently control and reconfigure the gymnasium equipment on a regular basis.

The key to achieving the latter is through the thoughtful application of control systems. These can range from simple key switches to canned group control systems all the way up to high-end custom programmed control systems. Whatever the case may be, the most efficient, cost-effective control solutions can only be achieved with preplanning between the facility owner, architect, contractor, and controls equipment manufacturer.

While stationary backstops and/or wall-mounted backstops folded with manually operated winches are an option for gym owners, ceiling-suspended units folded with motorized winches are by far the most commonly specified for today's gymnasiums. (See the Ceiling-Suspended Systems sidebar for additional information on this topic.)

Before delving into the details of the different gymnasium equipment control

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Learning Objectives

After reading this article, you should be able to:

1. Explain the rules for safe operation of large gymnasium equipment.
2. Analyze the advantages and applications of control systems, from simple key switches to canned group control systems to high-end custom programmed control systems.
3. Assess the advantages of preplanning by the facility owner, architect, contractor, and controls equipment manufacturer when designing a gymnasium control system.
4. Discuss gymnasium control systems case studies that demonstrate the collaborative project team process and optimized end results.

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

AIA COURSE #K2104F

systems and project planning process, architects should be aware of a few general safety principles when it comes to heavy overhead gymnasium equipment.

GYMNASIUM EQUIPMENT CONTROL SAFETY

Because gym equipment like basketball backboards suspended overhead weigh thousands of pounds, it is essential that the equipment be raised and lowered in a safe manner. Consequently, only authorized and properly trained individuals should operate the equipment. Further, the equipment should never be operated when people are underneath or in the area around it.

When controlling the equipment, the individual raising or lowering the backboard, volleyball net, or gym divider curtains, for example, must be in full view of the equipment the entire time that it is in motion. All control systems also require a key or password to prevent unauthorized users from operating the equipment.

In an *Athletic Business* article titled "Technology Makes Accommodating Gym Activities Easy," Senior Editor Paul Steinbach writes, "Most systems in place today, including those still employing individual key switches, require continuous contact with the controller while the equipment is in motion. If at any point a button or key is released, the equipment stops instantly—a handy feature when a potential obstacle has been spotted."

Photo: Jeff Bell Photography



Electric height adjusters are among the equipment that is controlled by a control system, as shown here at the ArchBold Evangelical Church in Archbold, Ohio.

KEY SWITCHES

The most basic control for gym equipment is key switches where one piece of equipment is operated from each key switch with a dedicated circuit for each device. Switches are available from one key on a single-gang plate up to seven keys on a seven-gang cover plate. The technology is very reliable and secure, assuming keys are only issued to trained and authorized individuals.

To maximize effectiveness and safety, it is important to avoid some field-observed pitfalls. These include leaving keys in switches, which effectively leaves the control open for anyone to operate. Without proper training, unauthorized users can potentially operate equipment in a dangerous manner.

Another problematic issue is simultaneously running multiple devices by holding down multiple key switches at the same time in a manner that leaves the user unable to observe equipment in operation. Users should also be cautioned against using broom handles, heavy chains of keys, or other methods to hold the switch in an on position while the operator walks away and fails to supervise the raising and lowering of very heavy equipment.

WIRELESS REMOTE CONTROLS

The first advancement beyond key switches was the introduction of wireless remote controls more than 30 years ago. Wireless controls work with a receiver at each motor and handheld transmitter, similar to a garage door opening system. The receivers are programmed, frequently with dip switches, and each device is assigned its own unique channel. Operated by radio frequency (RF), the users select the chosen channel from the transmitter, but they must be physically located no more than 100–125 feet in proximity to the receiver.

Though it is very rare, there is a small possibility that the transmitter could interfere with other RF devices or encounter interference.

Higher-quality wireless systems will prohibit multiple transmitters from attempting to operate at the same time by locking out the other channels while one device is being operated. Consequently, a second and third transmitter, for example, will not be able to access any channel for multiple wireless operations.

Continues at ce.architecturalrecord.com

Barbara Horwitz-Bennett *is a veteran architectural journalist who has written hundreds of CEUs and articles for various AEC publications.* ***www.bhbennett.com***

Photo courtesy of Draper Inc.



When operating heavy gymnasium equipment, the facility manager must be in full view of the equipment, and continuous contact with the controller is required while the equipment is in motion.

DRAPER

Based in Spiceland, Indiana, Draper is a leading manufacturer of gym equipment for the North American architectural market. It provides architects and designers with flexible gymnasium solutions that are custom designed to fit a specific facility. To learn more about Draper, visit **www.draperinc.com**.

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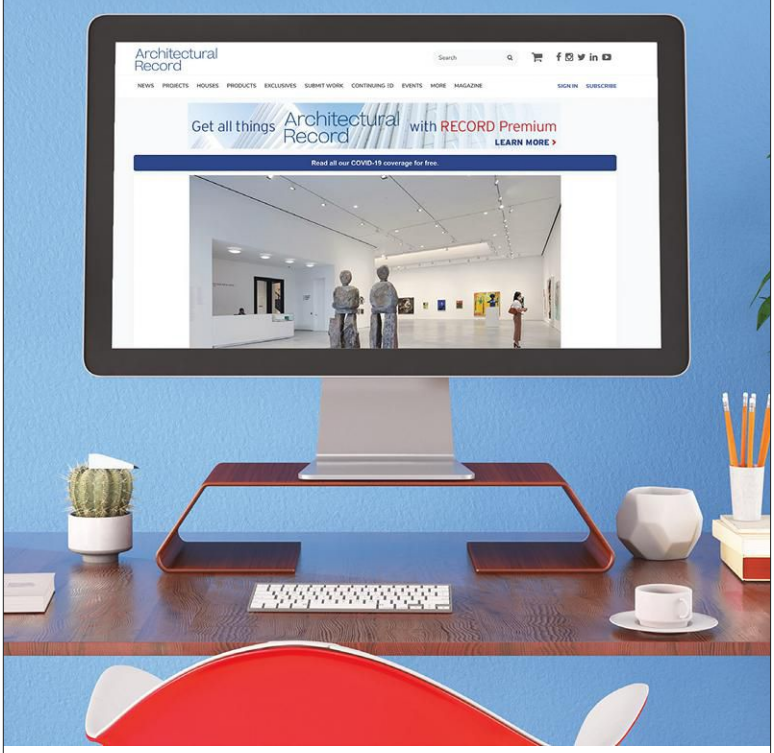
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Upcoming Exhibitions

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

Ongoing Exhibitions

Engineer, Agitator, Constructor: The Artist Reinvented
New York
Through April 10, 2021
This exhibition, at MoMA, looks at the reinvention of the role of the artist and the functions of art that took place in tandem with historical shifts in industry, technology, and labor amid the impact of World War I, the Russian Revolution, the collapse of the Austro-Hungarian Empire, and the rise of fascism. Highlighting figures such as Aleksandr Rodchenko, Lyubov Popova, John Heartfield, and Fré Cohen, this exhibition demonstrates the ways in which artists reimagined their roles to create dynamic work for a new world. More at moma.org.

Howardena Pindell: Rope/Fire/Water
New York
Through April 11, 2021
For her solo exhibition at the Shed, Howardena Pindell presents her first video in 25 years—a project unrealized for more than four decades, which the Shed commissioned her to complete. In *Rope/Fire/Water*, Pindell recounts personal anecdotes and cites anthropological and historical data related to lynchings and racist attacks in the United States, using voiceover with archival photos of lynchings and the May 1963 Birmingham, Alabama, Children's Crusade, a series of nonviolent protests carried out by young people. Learn more at theshed.org.

Goodnight House
New York
Through April 29, 2021
This exhibition, at Fort Makers gallery on the Lower East Side, features new artwork and objects inspired by the children's classic *Goodnight Moon*. The works shown include an upholstered bed and handwoven textiles, ceramic table lamps, a rocking chair, stools, and a cloud-shaped bedside table and storage unit, among other gallery-commissioned objects. See more at fortmakers.com.

The Long Dream
Chicago
Through May 2, 2021
This new exhibition at the Museum of Contemporary Art is inspired by the current moment, giving shape to issues heightened by the pandemic and social unrest. It features over 70 Chicago artists, with work ranging from the visual arts to performance and public practice, selected by museum curators and programmers with different backgrounds and specialties. Named after a novel by author Richard Wright, *The Long Dream* is part reflection on the state of the world after the arrival of Covid-19 and part celebration of Chicago creative denizens. The goal of the exhibition is to amplify artists' voices and show artwork of a city grappling with anxiety and social unrest, letting artists have an impact during a time of social change. For more, go to mcachicago.org.

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

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

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

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

Competitions

Newhouse Architecture + Design Competition
Deadline: April 9, 2021
The 39th annual competition, sponsored through the Chicago Architecture Center, is an opportunity to showcase design talents of Chicago-area students who create projects that solve real-world problems. This year's competition highlights the city's INVEST South/West initiative by concentrating entrants' efforts on proposals to improve the quality of life in the Auburn Gresham, Austin, and Englewood neighborhoods. For more, go to architecture.org/newhouse.

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

Events

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

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

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

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Ⓡ Regional AD

SNAPSHOT



DEEP IN the Arizona desert, against the jagged outline of the Swisshelm and Pedregosa mountains toward the Mexican border, an upended reinforced-concrete ziggurat disappears into the red clay earth. The 50-foot-square subterranean pavilion, McNeal 020, the first built project by Paris-based David Telerman, "reveals itself progressively," says the designer, who has long been fascinated by the beauty and desolation of the American Southwest desert. The design encourages viewers not only to discover elements of nature from various vantage points, but also to explore "how the body reacts to architecture" at multiple levels—of the structure, and sensorially and viscerally. Using cast-in-place concrete, Telerman hoped to underscore the contrast between the natural context and the manmade structure that otherwise might melt into the landscape. Long, perpendicular bars of concrete traverse the desert floor and form bridges leading to a central platform bordered by four staircases that comprise an inverted pyramid. The structure dives some 9 feet into the ground to an enclosed central space containing only a bench, inviting visitors to a moment of solitary contemplation. *Ilana Herzig*

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