

ARCHITECT

Co Adaptive
Islyn Studio
1Architecture
Margaret Sullivan Studio

Mental Health in Architecture
Bathrooms Beyond Compliance
Rosa Sheng on Equity and Wellness
Walter Hood on Bespoke Landscapes

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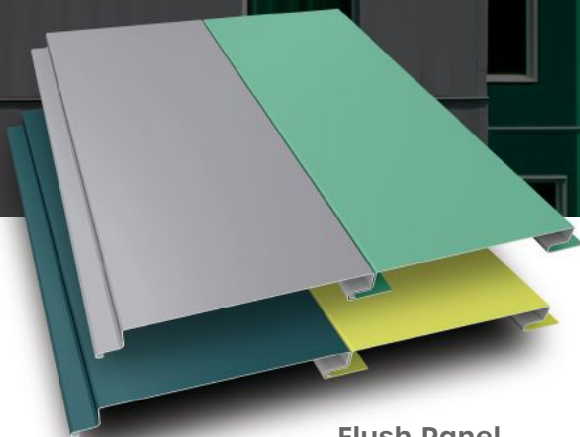
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It's an idea that's been around for thousands of years – think gardens of Babylon – and yet the way it contributes to our health and well-being in modern construction and manufacturing is being emphasized like never before. As architects and designers work on new ways to connect the outdoors with the indoors, new window and door innovations are emerging to support the Biophilic Design approach.

Making more and better use of light. Designers continually discover new ways natural light improves our lives, indoors and outdoors. The changing color of sunlight throughout the day affects our mood, our stress levels, our sleep patterns and even our physical health. Knowing this should lead to an increase in the use of glass and wide open spaces in our built environments. When done right, the approach is beautiful, energy-smart, and beneficial for all.

Creating spaces that invite more of the outside, inside. Opening up spaces to connect with nature and living systems (one of the key tenets of biophilia) delivers amazing benefits to our health and well-being. Studies have also shown slight changes in airflow keep us refreshed and invigorated, more productive, relaxed and generally better off. Large timber curtain walls and door openings that turn entire walls into moving masterpieces are merging the outdoors and indoors in new, forward-thinking ways.

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On the cover: Illustration by Calvin Sprague.

Below: Terra Heights by 1Architecture; photo by Leonid Furmansky.



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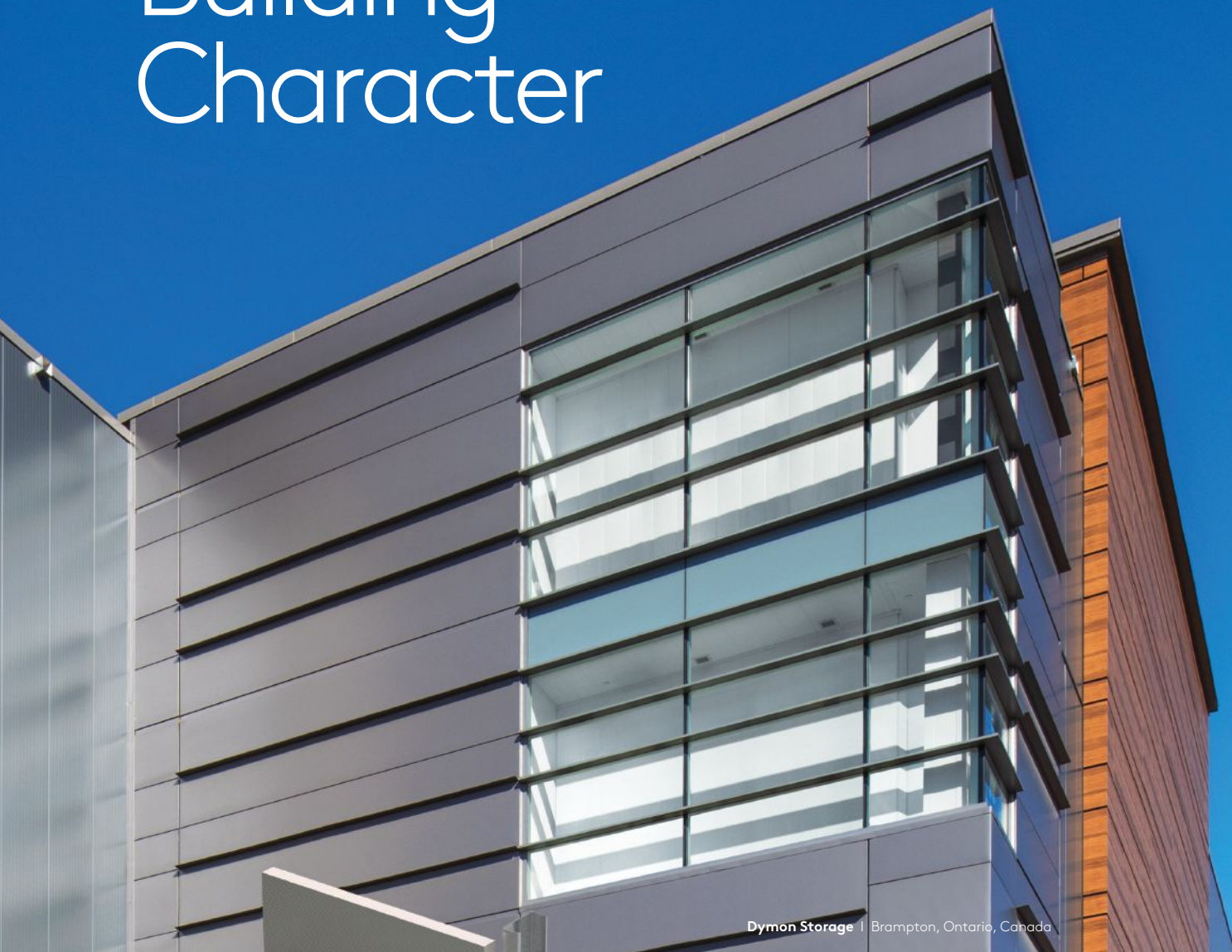
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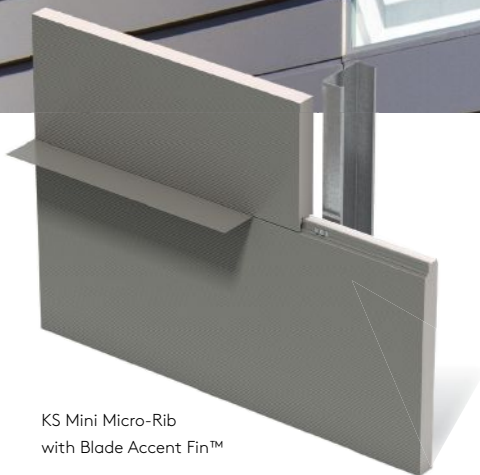
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Correction: ARCHITECT's March issue misreported the architects for the 2022 P/A winner Pilares 02 and 03. The project was a collaboration between WorkAC in New York and Ignacio Urquiza Arquitectos in Mexico City.

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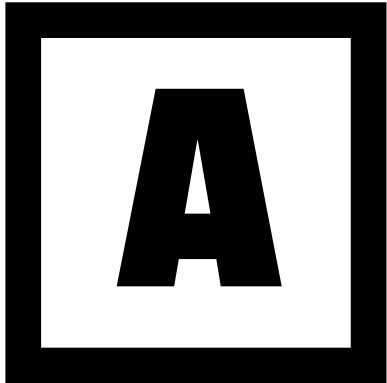
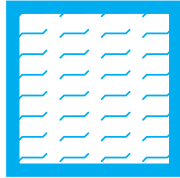
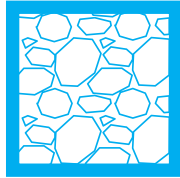
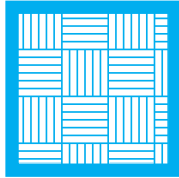
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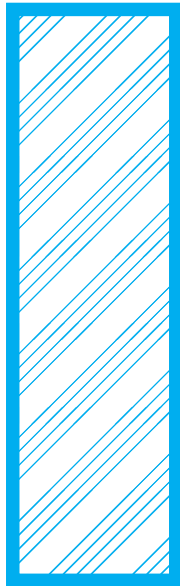
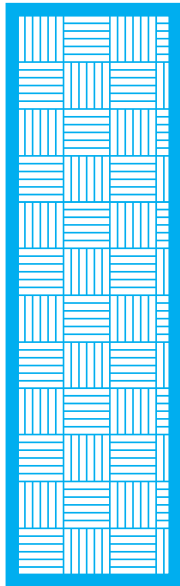
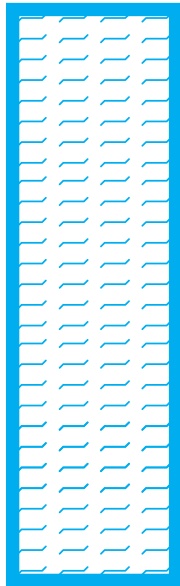
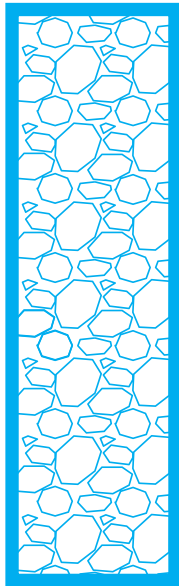
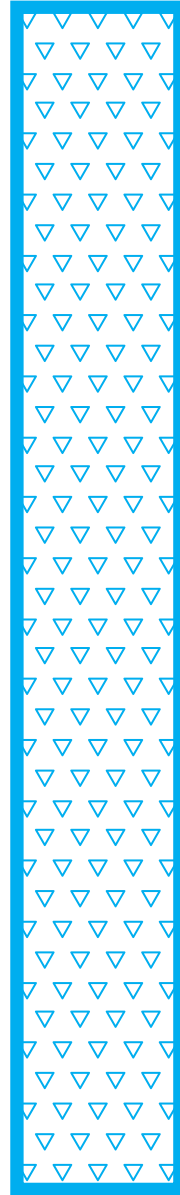
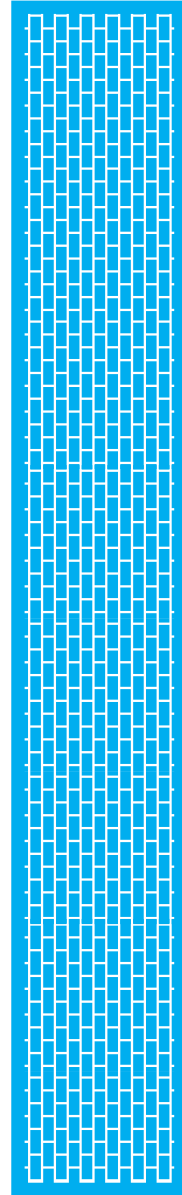
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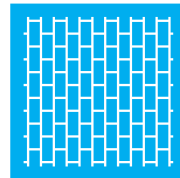
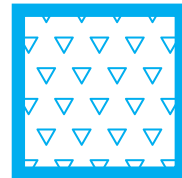
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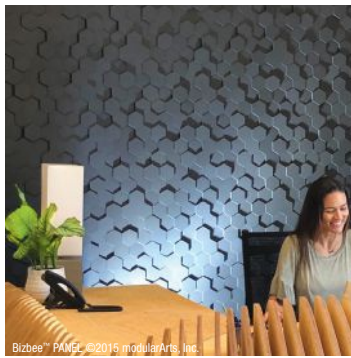
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Next Progressives: Co Adaptive Architecture

EDITED BY PAUL MAKOVSKY



Firm leadership: Bobby Johnston, AIA, and Ruth Mandl, AIA

Location: Brooklyn, N.Y.

Year founded: 2011

Education: Mandl: M.Arch. from Columbia University; B.A. in interior design from Kingston University London; Johnston: M.Arch. from Columbia University; B.A. in architecture from University of California, Berkeley

Firm size: Six

Mission: Amidst an industry that is focused on the finished image of architecture, we want to turn the focus to the means of making and maintaining it. Our practice places importance on those aspects generally hidden from view in a finished project, emphasizing building performance alongside the past and future journeys of all the ingredients as they come

together. Often, the best materials to use are those that already exist. To that end, we accentuate adaptive and material reuse, reinventing existing building stock and reviving old elements in the buildings we renovate. We are strong believers that architecture is a process rather than a result; it should be a collaborative practice that works to solve today's biggest challenges—doing this by building upon the past rather than reinventing it.

Origin of firm name: Coadaptation is a term in biology used to describe the process by which a bee adapts to a flower, just as the flower adapts to the bee. For us, the name gets to the core of our goal for architecture as a process, rather than something static, which must continuously adapt to the planet we live on and the people who use it.

First commission: A movable door/wall that carved a new kid's room from a larger family space.

Defining project: The self-commissioned renovation of our own brownstone in Brooklyn allowed us to implement goals for high efficiency, electrification, and renewable energy—turning a beautiful, century-old building into a highly resilient home to take our family into the future, whilst respecting and celebrating the past.

Another important project: Our recently completed Timber Adaptive

Reuse Theater was a dream project for us. In collaboration with a fantastic and innovative client, we celebrated the building's existing heavy timber structure and used CLT for required structural insertions in the reuse of the space. For us, this project embodies many of our values for an architecture that starts to tackle not just operational energy but also embodied energy and material cycles.

One thing everyone should know about your studio: We think old modes of hierarchical thinking are behind us and believe architecture is not about ego but about collaboration.

Design aggravation: The continued use of packaged terminal air conditioner units! The worst, most inefficient way to heat and cool our spaces.

Biggest challenge facing architects today: Designing for inclusivity; allowing everyone to face the climate challenges that lie ahead.

Most urgent policy question: How do we incentivize a circular economy and an equitable use of the planet's remaining resources?

Skills you hope to master: Mandl: Driving, working with wood; Johnston: Public speaking, paring down to-do lists.

Favorite rule to break: Never be the first to leave the studio.

**Next Progressives:
Co Adaptive Architecture**



1, 2. The BedStuy Passive House in Brooklyn, N.Y., is a Victorian townhouse renovated to become a certified Passive House with the aim of retaining as much of the original character of the building as possible while reducing its operational energy use. The envelope was substantially insulated on the interior of the building and new triple-pane windows were installed. Operable exterior shades were tucked behind the existing brownstone to mitigate solar heat gain when closed. 3–5. Originally a metal foundry, the Timber Adaptive Reuse Theater in Brooklyn, N.Y., has been transformed into a new developmental space for theater artists. The project exemplifies low-carbon design through adaptive reuse while repurposing removed building materials to create architectural features and minimizing the use of virgin materials. The structural insertions leverage low-carbon alternatives to standard construction practices by introducing sustainably forested mass timber.



1, 2 PETER DRESSEL; 3, 4 NAHO KUBOTA

CarbonPositive: Evolving the Embodied Carbon Landscape

TEXT BY VINCENT MARTINEZ, HON. AIA

We are all in this together. When we talk about the imperative for climate action from the built environment community, we are talking about architects and all allied professionals: engineers, planners, landscape architects, and many others. That we are all in this together is true for the community of all living things, and it is true for all the disciplines that participate in making the built environment.

“At this juncture, the need for cross-disciplinary collaboration at this scale has never been greater.”

When Architecture 2030 and Edward Mazria, FAIA, first issued the 2030 Challenge in 2006, there were many questions in the marketplace about where and how emissions could be addressed in building projects. Architects and The American Institute of Architects were early adopters, and by 2008, the AIA 2030 Commitment launched. As our understanding of embodied carbon has grown, architect-led teams have addressed sustainable building through thoughtful designs and material selection. Other disciplines have also mobilized to support this agenda with their own initiatives and calls to action,

including structural engineers with the SE 2050 challenge and commitment addressing the embodied carbon of structural systems; and the mechanical, electrical, and plumbing engineering community with the MEP 2040 challenge addressing the climate change impacts of refrigerants, among other goals.

Architects also understand the embodied carbon challenge goes beyond the building and includes sites, landscapes, and infrastructure. This movement too has been maturing, just as the need to accelerate climate change mitigation and adaptation is becoming more apparent given the latest climate reports. At this juncture, the need for cross-disciplinary collaboration at this scale has never been greater, especially as teams are continuing to expand and refine their approaches, focusing on reducing emissions and increasing CO₂ sequestration, while creating resilient and equitable communities.

Some of the greatest clarity and strength on this front can be attributed to the Climate Positive Design Challenge, which catalyzed not only the American Society of Landscape Architects Climate Action Committee, but also the International Federation of Landscape Architects' Climate Action Commitment, for their 70,000 global members, which was launched ahead of COP26. The official Architecture 2030 COP26 event in Glasgow included representatives from AIA, the Australian Institute of Architects, the

Royal Institute of British Architects, ASHRAE, IFLA, and the Climate Heritage Network and is an example of this new cross-disciplinary alignment.

At the project level, these collaborations are critical—architects are working closely with landscape architects, civil engineers, planners, urban and interior designers, and structural and M/E/P engineers. As the need for urgency to respond to climate change grows, so too does the imperative to crystallize what climate action is for your team and your firm. When you begin a project, bring the gravity of the AIA 2030 Commitment to the table, and encourage your colleagues to articulate their disciplines' commitments, too. Each discipline's approaches to measurement, its tools, and its learnings, can influence the others—the more we share tools and intelligence, the greater impact we can have.

We've been making progress. Architects can continue to push forward, leading the built environment community toward greater impacts—slashing emissions, sequestering carbon, and creating resilience, equitable communities, and more biodiverse environments.

Through his 15-year tenure at Architecture 2030, Vincent Martinez, HON. AIA, has been working to solve the climate crisis by catalyzing global-building decarbonization efforts.





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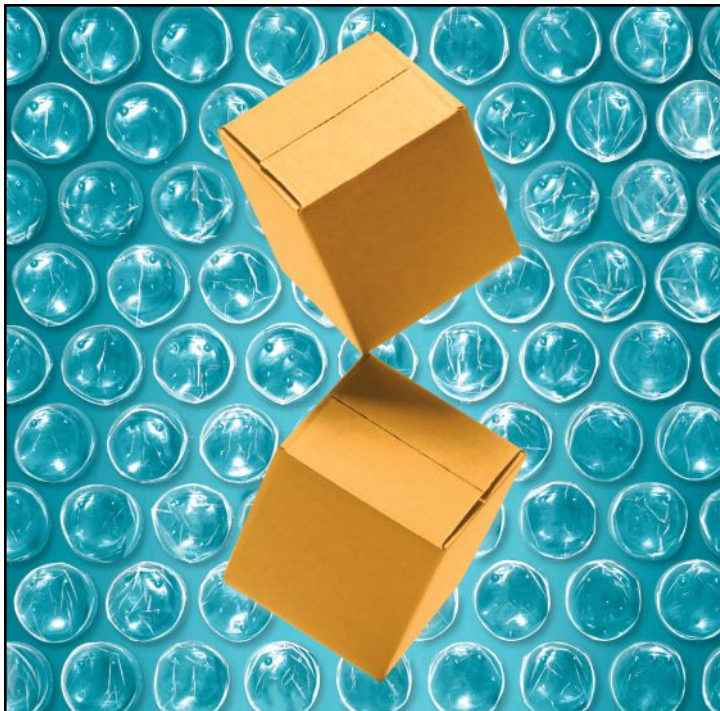
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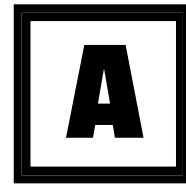
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In this new series on innovative spaces, we ask a designer, Ashley Wilkins, on the thinking behind designing the Twig Fertility clinic.

Inside Out:

Using Hospitality to Create a Joyful and Optimistic Healthcare Experience

EDITED BY PAUL MAKOVSKY

The Project:

Twig Fertility Clinic, Toronto, Ontario

The Client:

Twig Fertility, an in vitro fertilization and egg-freezing clinic and lab in midtown Toronto, was co-founded by Zach Shapiro, Tanner Kohara, and Rhonda Zwingerman. As former patients themselves, Kohara and Shapiro knew that the patient experience in Canadian fertility needed a significant overhaul: "With Twig's patient-first approach, we have redesigned both the physical and digital experience into an elevated, modern, and cohesive journey for our patients," Kohara says. "We have also put the same level of thought into the design and build-out of our IVF laboratory."

About Islyn Studio's Philosophy:

Islyn (eye-lynn) is a women-run design studio, based in Brooklyn, N.Y., which creates hotels, retail spaces, restaurants, and objects that explore contemporary culture and aesthetics through a lens of immersive sensory experience.



Ashley Wilkins, founder and creative director, started Islyn in 2017 as a way to shift design into a kinder, more meaningful place. With a decade of experience at a wide swath of design firms, including Ace Hotel Group, Rockwell, Avroko, and Crème Design, where she worked with clients like Walt Disney Imagineering, Four Seasons, and BuzzFeed, Wilkins is well-versed in the inner workings of large-scale hospitality, retail, and commercial projects. She holds a B.F.A. in Interior Design from Ringling College of Art and Design, in Sarasota, Fla.

> To read more about this project, please visit bit.ly/ARiOIS.



← CHANGING ROOM

We want this patient changing room to be reminiscent of a high-end gym or a spa. There's a plush carpeted floor; everybody has their own private locker, a basket to carry clothes to the exam room, and a custom robe from Deiji Studios to change into; and all of that is kept super private from any visibility area. We also helped the client to find brands to help curate the clinic spaces with thoughtful retail partnerships with Canadian-based brands like Binu Binu for natural soaps and Vitruvi for essential oils and diffusers, and curated brands from elsewhere such as Lightwell Co., Hatch, and Golden Flourish, to name a few.

SECONDARY ENTRANCE →

With the entrances, privacy is important. With a front entrance and a secondary one in the back, we had to figure out how to welcome and greet people, and move them around the space through different corridors to make sure that there is no crossover, since privacy is so key.



Products: ICFF Preview

The International Contemporary Furniture Fair returns in person to New York's Javits Center May 15 to 17, 2022. The fair showcases new designs for the residential and contract markets from over 300 established and emerging brands from more than 25 countries, in addition to the ICFF Studio, a partnership with Bernhardt Design that highlights the work of the next generation of emerging talent. Here is a preview of some of the design debuts you'll find at the fair.

TEXT BY PAUL MAKOVSKY



Fractal Fluency Carpet Plank Collection, Mohawk Group

Mohawk's new modular carpet collection uses fractal patterns that mimic stress-relieving qualities in nature. Available in two styles, mounted on Mohawk Group's EcoFlex One backing, the 12" x 36" tiles are made from durable nylon using a carbon neutral process. [mohawkgroup.com](https://www.mohawkgroup.com)

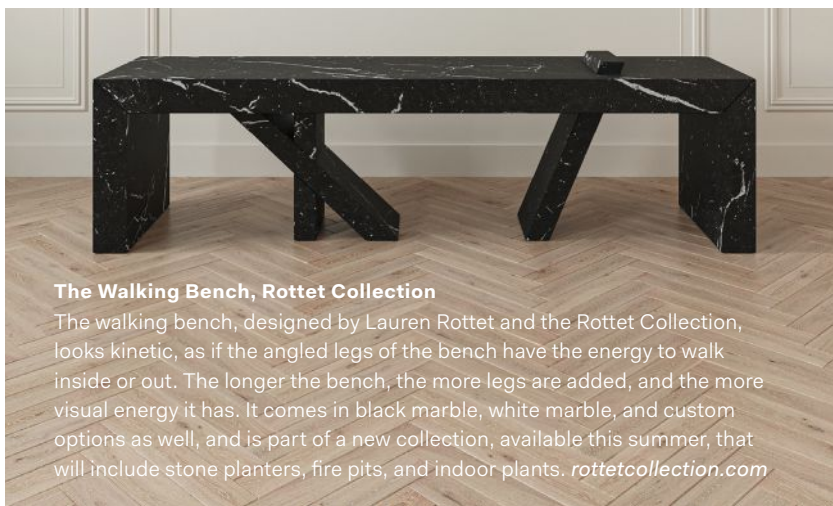
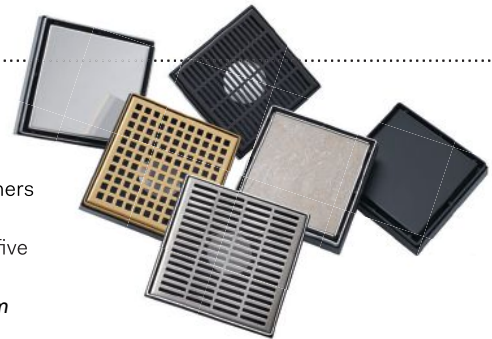


Mulholland Chair, Bernhardt Design

Pasadena, Calif.-based designer Cory Grosser created a contemporary chair rooted in tradition and inspired by Hollywood's Mulholland Drive. The shell functions as the seat, back, and armrests, blending into a solid ash frame, available in multiple finishes. A seat cushion provides additional comfort and can be customized by using contrasting textiles. [bernhardtdesign.com](https://www.bernhardtdesign.com)

Center Drain Pro-Series, Infinity Drain

Available in three decorative styles, this 5" x 5" center and tile drain aims to meet the containment needs of specifiers and homeowners alike. Compatible with traditional and modern waterproofing techniques, the drain comes in five finishes, such as satin bronze and matte black, using U.S.-sourced materials. [infinitydrain.com](https://www.infinitydrain.com)



The Walking Bench, Rottet Collection

The walking bench, designed by Lauren Rottet and the Rottet Collection, looks kinetic, as if the angled legs of the bench have the energy to walk inside or out. The longer the bench, the more legs are added, and the more visual energy it has. It comes in black marble, white marble, and custom options as well, and is part of a new collection, available this summer, that will include stone planters, fire pits, and indoor plants. [rottetcollection.com](https://www.rottetcollection.com)



Combi Pendant Light, Konzept

The Combi Pendant series by Konzept adds new, customizable elements into otherwise static pendant designs. The 1.5" cylindrical light comes in five different lengths, all with an innovative 2-in-1 mounting capability for suspension and ceiling flush mounting. Over 10 optional attachments—such as glass shades, acoustic panels, and a cylindrical snoot—are available. [konzept.com](https://www.konzept.com)



Allaria Bath Collection, Brizo

Defined by curved, geometric shapes, this collection of bathroom fixtures features clear handles and a ribbon spout. Available in eight finishes, such as polished chrome and matte black, the collection also includes lavatory and tub filler configurations, custom shower trims and components, and coordinated accessories to finish the bath space. [brizo.com](https://www.brizo.com)



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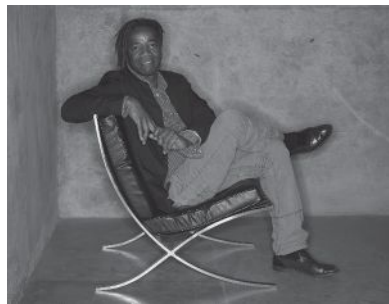
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Opinion: Bespoke Landscapes, for the Past and Future

TEXT BY WALTER HOOD



As chronic diseases soar and physical activity shrinks among America's residents, it's clear that a community's physical condition has implications for residents' health and well-being. Research shows that life expectancies and quality of life are linked to social and built environments. We don't need studies to recognize that fresh air, green space, and safe streets are nowhere close to evenly distributed.

In these times, thinking about urban landscape design as a smattering of cookie-cutter playgrounds and community gardens isn't enough. Frankly, it never has been. We must approach landscape architecture in terms of functionality, an area's history, and residents' specific wants and needs, be it more green space in dense urban settings or community gardens and game areas to promote collaboration and interaction. All of these missions must be executed with an unerring focus on sustainability, ecology, and equity.

That has been the premise behind Bronzeville Lakefront, a 100-acre development on Chicago's South Side that includes the former Michael Reese

Hospital site. It offers an opportunity to implement forward-thinking urban landscape design principles without erasing the past.

Reimagining Urban Landscapes

First, there's the principle of place. A landscape isn't simply a physical environment; it's a reminder of heritage. Streets, sidewalks, trees, and tracts of land are all imbued with history that spans vast periods of time. There's heritage there.

Bronzeville was formerly a bustling Black metropolis. The Great Migration saw more than 6 million Black people leave the American South for the urban North in the first half of the 20th century, and the Bronzeville neighborhood became a thriving center for Black arts, culture, and entrepreneurship. Even as the early 20th century witnessed many injustices and sorrows for Black Americans, there was also an abundance of Black joy in Bronzeville as thousands of people of color experienced it as a thriving environment where everyone felt welcome to congregate in the streets.

In the first half of the 20th century, a bustling stretch of Bronzeville's State Street known as "The Stroll" was home to a cornucopia of jazz and blues nightclubs frequented by the likes of Louis Armstrong, Nat King Cole, and Jelly Roll Morton, as well as ballrooms, theaters, and other businesses.

Bronzeville Lakefront must pay homage to that era, while also crafting the South Side of the future. With

innovative landscape design, this regenerated community can create a thriving environment with robust outdoor spaces such as fitness courts, outdoor dining areas, eco-themed gardens, and playgrounds. A new stretch of Cottage Grove, another major artery in Bronzeville, is being added in Bronzeville Lakefront to facilitate better transit access, and it will be brought back to life with features like bespoke benches and hatches positioned to resemble a jazz score. New pockets for outdoor dining and seating areas in this development, and along Bronzeville's major streets, can, and hopefully will, become characteristic of the entire neighborhood and create space for residents to mingle, relax, enjoy the land, and be joyful.

Innovative urban landscapes must also incorporate an area's ecology. Ecology of place is rarely talked about in communities of color. Bronzeville Lakefront is bound in the east by Lake Michigan, which creates a series of green "ribbons," lush stretches that run parallel to the waterfront, enabling healthy living while referencing the woodland, wetland, and dune habitats.

Finally, there's the idea of belonging. It's crucial that Bronzeville Lakefront's landscape incorporates built spaces that feel safe and accessible for community members. A sense of alienation can occur through built landscapes, which often happens when developers or landscape architects erase everything.

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term palimpsest, something that has diverse layers, apparent beneath the surface like coats of paint revealed as they peel. The idea is to identify elements of a landscape from the past that resonate with people today, and to leave those elements undisturbed. In a previous project, we left the public sidewalk, where people had written their names and stains remained from long ago. In other words, there's life there. In Bronzeville Lakefront, we'll keep elements of the original landscape intact so that residents continue to see their legacies alive.

Redefining Success in Urban Landscapes

I believe a successful landscape design is a matter of sustainability—from an environmental and social standpoint. The best design remains intact for generations and stays accessible, welcoming, and recognizable to longtime residents.

One example is Lafayette Square Park in Oakland, Calif., a project Hood Design Studio completed in 1999. The process included building in traces of the park's origins and providing for a diverse array of visitors and varying needs, from game and performance spaces to picnic areas and playgrounds. More than 20 years later, the park still stands, and Black residents are still visiting; they didn't get pushed out. Another example is Splash Pad Park in Oakland, a project under a freeway that few thought could sustain itself. It is now approaching its 18th year and is home to Oakland's largest weekly farmers market.

Dissimilarity is another marker of success. If a finished project looks atypical, like it wouldn't exist anywhere else, that typically means landscape architects have done their job. With any project, the endgame should not be sameness. Each landscape has a different history; landscape design

should be bespoke, reflecting the particularities and genealogy of place.

When it comes to Bronzeville Lakefront, regenerating a long-vacant tract of land to meet expansive and exacting objectives for a new era is a significant undertaking, a vast enterprise that involves developers and community stakeholders, commercial and residential buildings, lofty visions and rooted histories, healthy living targets and high stakes. Landscape architecture is just a fraction of Bronzeville's larger transformation, but it's also a pathway to tap into a cultural tapestry that draws on Bronzeville's rich history while telling new stories.

Walter Hood, ASLA, founder of Hood Design Studio and a professor at the University of California, Berkeley, is a recipient of the 2017 Academy of Arts and Letters Architecture Award, 2019 Knight Public Spaces Fellowship, 2019 MacArthur Fellowship, and 2019 Dorothy and Lillian Gish Prize.

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Residential:

Terra Heights Tulsa, Okla. 1Architecture

TEXT BY PAUL WELLINGTON

The Heights historic neighborhood, located just north of downtown Tulsa, Okla., has enjoyed a revival over the last few decades. Formerly known as Brady Heights, the neighborhood had been named for W. Tate Brady, a founding father of Tulsa in 1898 and a successful businessman and politician. Many residents believed, however, that his membership in both the neo-Confederate group Sons of the Confederacy and the white supremacist organization Ku Klux Klan outweighed his industrious legacy, and the neighborhood association voted to change its community's name in 2021.

Listed on the National Register of Historic Places since 1980, The Heights and many of its houses reflect the varied tastes of original owners, setting an architectural standard for middle- and upper-class developments. Over the years, the community has become close-knit through renovations of its eclectic residences, encompassing architectural styles such as Queen Anne, Victorian, Georgian Revival, and Craftsman. One new addition, a 3,550-square-foot, rammed-earth house by the local firm 1Architecture, continues the community's eclectic tradition, adding Prairie School influences into the mix and furthering the conversation surrounding sustainable residential construction.

Nick Denison, ASSOC. AIA, a 1Architecture principal, was approached by a friend in 2017 to



The exterior construction of Terra Heights is stabilized with rammed earth, a low-embodied-carbon building material that is durable, energy-saving, beneficial for indoor air quality, and resistant to wind and fire.

design a residence in The Heights. As a designated historic neighborhood, The Heights has a number of restrictions and policies for newly constructed homes, including architectural styles. Encouraged by the site's sloped profile, 1Architecture suggested a Prairie School-style project, emphasizing the horizontal rather than the vertical through bands of windows, striated exterior walls, and "low-slope hip roofs that help showcase the [exterior walls]," Denison says.

But the project, ultimately dubbed

Terra Heights, has another defining feature: The house is constructed of rammed earth, a material that interested the Terra Heights clients due to its low embodied energy and durability. Ultimately, over 90% of the project's mass was sourced from within 100 miles of the construction site; the residence also features efficient operational systems and, in conjunction with its materials, is designed to last multiple generations.

The project, completed in 2019, greets visitors with a sweeping cantilevered roof, spanning a depth

The background of the advertisement features a teal-to-blue gradient. It is populated with numerous fingerprints of various colors (white, grey, blue, black) scattered across the surface. In the lower right quadrant, there is a cluster of red, spherical virus-like particles with a textured, spiky surface. The text is rendered in a white, hand-drawn, chalk-like font with a slight shadow effect.

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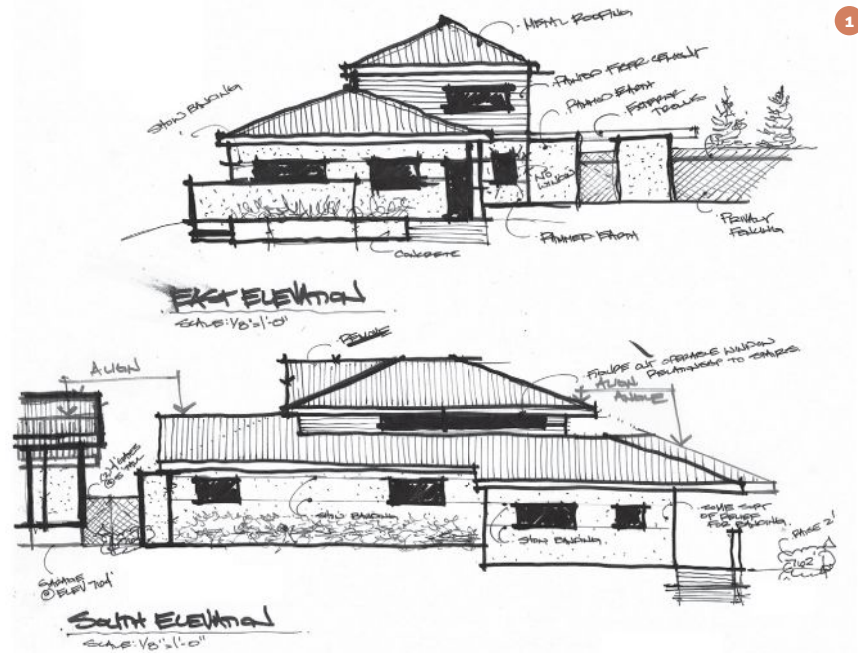


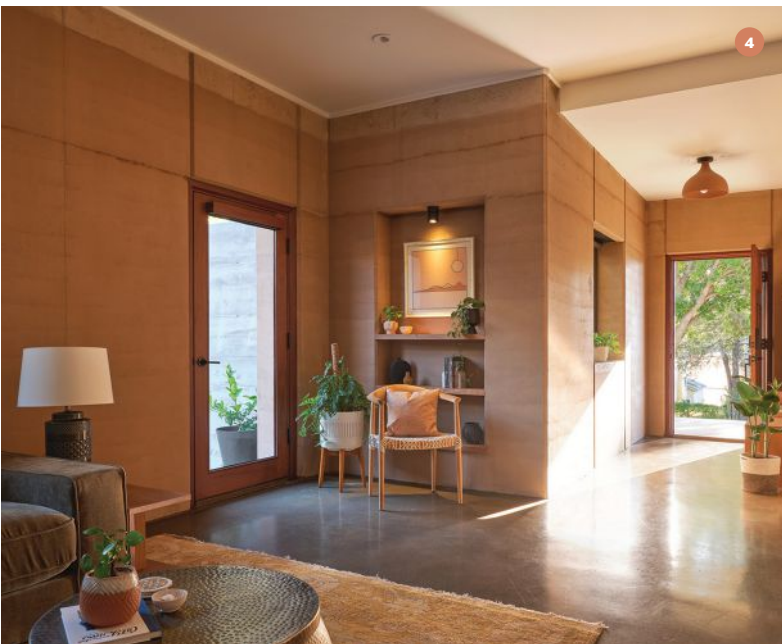
Residential: 1Architecture

of 13 feet. While the extension initially called for a steel frame, the design was simplified to wood construction. The interior features a split-level main floor and a partial second story. The kitchen and dining areas, located toward the back of the house, are raised to accommodate the slope of the site. Neutral, earthy tones of white finishes, wood accents, and concrete floors accentuate the construction. Denison chose this palette as "everything works in tandem with the texture and color" of the rammed earth walls.

Terra Heights is one of four structures designed to accommodate a multigenerational family. Adjacent to the site is a Craftsman residence for the owner's parents, with each property containing an on-suite attached to a garage. The two homes are linked by adjoining courtyards, providing an opportunity for public interactions among the families; however, each residence accommodates private spaces for intimate moments. The gathering space features a rammed earth fireplace and open rustic steel pergola, extending the interior earthy tones into the outdoors. Board form concrete walls assist in the division of the spaces as well as further emphasize the horizontality of the overall design. The walls of the courtyards also assist in protection from hot summers and high winds.

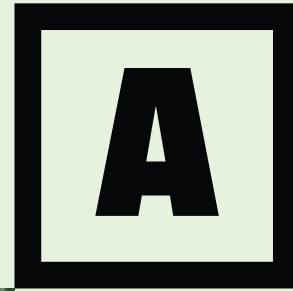
Though 1Architecture does not typically design residential homes, Denison enjoyed working on a project that was "more form fitting for human size." The scale, aesthetic, and design of Terra Heights functions as an admirable contemporary residence in The Heights historic neighborhood.





1. Terra Heights is sited to naturally create appealing private and shared outdoor gathering spaces.
2. Terra Height's split-level, 1.5-story design allowed 1Architecture to accommodate the east-sloping lot and define clear living spaces on the open-plan first floor.
3. The northern courtyard is sited to avoid blustery winds and the hot summer sun.
4. 1Architecture selected polished concrete floors for the lower split-level living spaces.
5. Elevated banded windows along the southern exterior permit winter solar heat gain.

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AIA Architect



MARK KUSHIMI

Modeling Mentorship

AIA Honolulu's 5x5x5 mentorship program is providing a national blueprint.

By Stephen Hicks

The catalyst for 5x5x5, a mentorship initiative of AIA Honolulu, was a lack of available networking and leadership opportunities for the chapter's younger members. Veteran architects wanted not only to engage novices but also to promote AIA membership to students and associate members. They envisioned 5x5x5 as a pipeline of future leaders in the architecture community. The program has become a model emulated by other AIA chapters around the country. We talked with Jen Toba-Davila, AIA, and her mentor Rod Nagao, about the power of mentorship to transform careers.

Toba-Davila: We have an innately giving culture, and the people of Hawaii are known for their generosity and the responsibility [they feel] to take care of future generations. These principles—ultimately grounded in reciprocity—allow the program to be possible and to thrive. We're extremely fortunate that we have a large pool of leaders within our

community who make giving back part of their legacy. Our culture is what keeps the program strong.

Rod put a lot of thought and effort into getting to know each and every mentee. His graciousness and time were extended to each mentee even after the program concluded, which are gifts many mentors might offer but don't follow through on.

With Rod's experience in construction and my being an architect, our work bonds us, as well as our other shared interests like golf, travel, and the importance of family. I have a lot of admiration for Rod and his dedication to mentor young professionals on his own time.

Nagao: As a mentee, follow your intuition in terms of what feels right. Be curious enough to ask lots of questions and that will help you get to where you need to in terms of a possible career.

Toba-Davila: I think architects aren't really different from most people. We're always

looking for connections, and we're looking for advice—especially when you're starting off new in your career; you just graduated; you're looking to meet people and wondering how to build your career and your professional development. That's a big driver for the program.

Mentorship is not hierarchical. You can learn something from everyone, and most times, the mentors walk away from the program learning just as much as the mentees.

Nagao: The program is being replicated elsewhere because it's a simple recipe. The program is structured in a way that it provides enough quality time between mentors and mentees.

Toba-Davila: Every AIA chapter has its different needs, so hopefully others can use the program as a blueprint or a roadmap to build off of. I'm really excited to see how the program can transform and evolve with the changing times. **AIA**

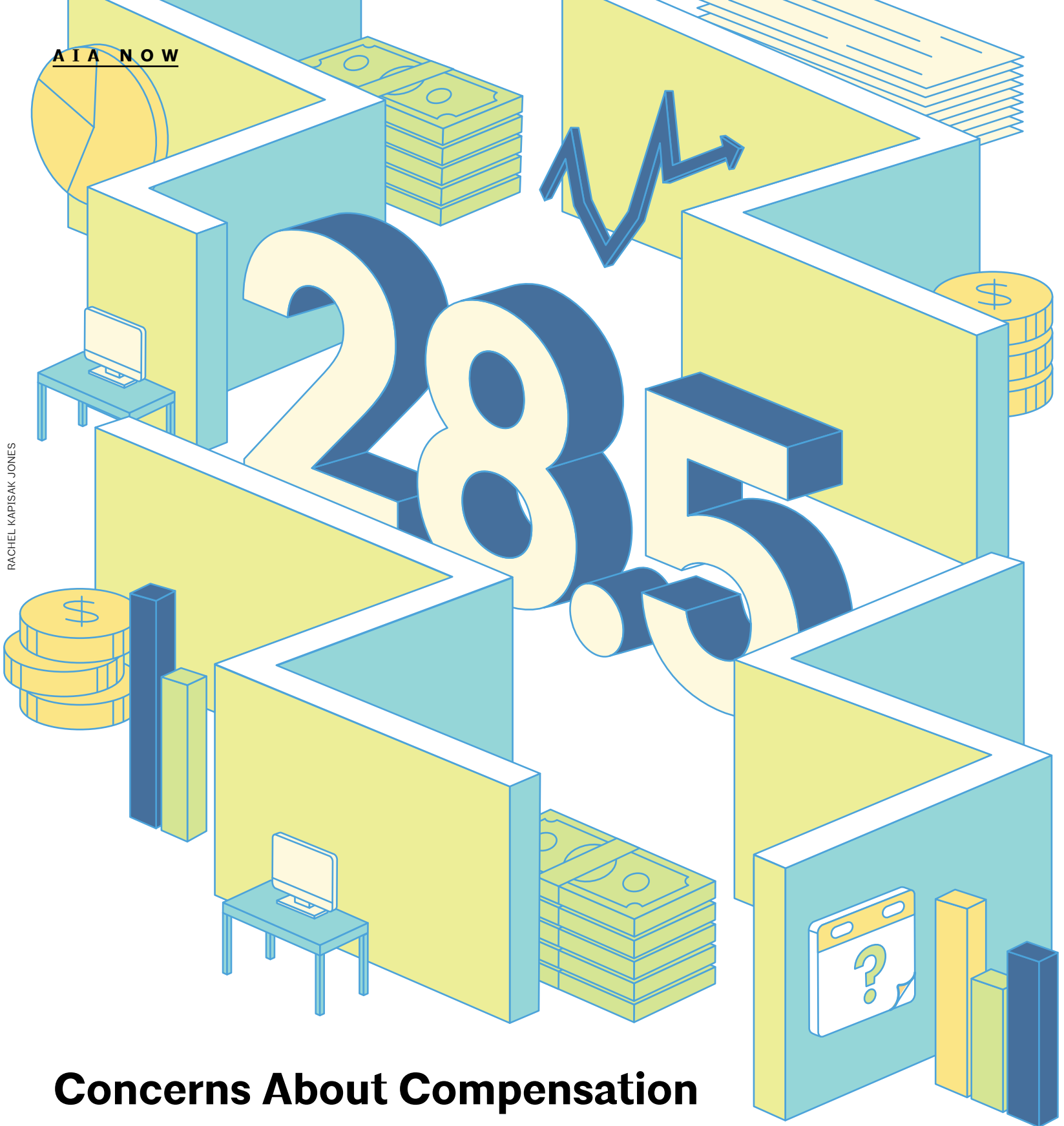


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Concerns About Compensation

By Michele Russo

Compensation levels for architectural staff are a major issue for their firms today, report 28.5% of firm leaders. However, there are stark differences by firm size—41% of firm leaders with more than 50 employees said compensation levels were a major issue, while only 16% of firm leaders with fewer than five employees reported the same. Other firm sizes fell in between—it was a major concern for 28% of firms with five to nine employees, 36% of firms with 10 to

19 employees, and 23% of firms with 20 to 49 employees. The level of position about which there was concern also varied by firm size. Firms with fewer than 10 employees were most concerned about compensating both entry level (fewer than three years' experience) and senior level (10-plus years experience) staff fairly and competitively. Larger firms were more concerned about compensation for midlevel staff, with four to 10 years of experience. **AIA**

How to Accelerate Decarbonization in Three Easy Steps

Less is less, experts say, but that requires us all to do more.

By William Richards

Pre-COVID-19 times seem like ancient history now, but it was only two and half years ago that ARCHITECT published a special issue on decarbonization—the first major design magazine to do so as a result of what it called the “carbon binge” we’ve been on for nearly three-quarters of a century. The January 2020 issue featured projects and ideas by Leddy Maytum Stacy, Payette, Skidmore, Owings & Merrill, and others, as well as a toolkit, of sorts, for ambitious firms to reorient their design philosophies and pursue policies to eliminate carbon emissions from the building sector. Architects, it appeared, were ready and able to change the status quo at the scale of the individual building or perhaps even the scale of the city block.

Reducing operational carbon and embodied carbon will be the new litmus test for healthier cities and towns. On one hand, decarbonization points to a precise goal for architecture and the built environment. It forms part of the foundation of the Biden administration’s Build Back Better bill (all but dead at press time), and it has been foundational for the clean energy policies in 14 states, as well as cities in an additional 24 states and the District of Columbia. On the other hand, decarbonization remains an imprecise set of operations for architects.

Despite the best efforts of 120 world leaders, COP26 in October 2021 did not prove to be as grand of a coda to ARCHITECT’s editorial coverage as one might have hoped, nor did it convince everyone that we were ready to deal with the urban, regional, or national scales

of decarbonization. It’s true that the resulting Glasgow Climate Pact created appropriately aggressive new standards for methane and deforestation, and more than 450 financial institutions promised to align their portfolios with net-zero aims. But, in the end, the cost of abandoning coal as a fuel source sooner rather than later was too dear for many nations, as was the financial commitment of richer countries to help poorer countries embark on decarbonization with political urgency.

The formula for change need not be complicated, though, according to some architects. The first step remains making a commitment, whether that’s for the mayor of a city of 5 million, or the partners of a firm of 15 architects and designers. The second step is getting others to make the same commitment—easier said than done, as they say. Firm leaders are often caught between their internal decarbonization strategies and business development realities, making it feel like they’re satisfying incommensurate ends. “If your firm has pledged to decarbonize and you’re working for clients who are unable to make similar commitments, then you’re collaborating with other firms to advocate for change, exploring co-benefits of decarbonization, while also wrestling with questions of job efficacy,” says Billie Faircloth, FAIA, a partner at KieranTimberlake in Philadelphia and a member of the leadership group for the AIA Committee on the Environment (COTE).

“For any architect designing to decarbonize,” Faircloth says, “we’re fundamentally talking about how to do

more with less impactful materials, building reuse, lightness, and new efficiencies—these precepts are established in our industry and are integral to long-standing conversations and conventions. These are also principles that clients understand.”

Faircloth and others say that total carbon—both embodied, which makes up to 90% of a building’s total contribution over its lifetime, and operational, which makes up the rest—is a total commitment, but one that is about hundreds of smaller choices that architects make each day. To help architects see their agency in this effort, dozens of volunteers developed the “COTE Super Spreadsheet” that any firm may use to understand and calculate metrics associated with the Framework for Design Excellence in order to analyze and improve their projects. Across 10 tabs, users can enter information about pre- and post-development project measurements, energy consumption data, factors like gross area with “quality views,” and number of materials that possess environmental product declarations (EPDs).

“In architecture, we often don’t like to take risks on materials and products because we rely on things we know perform well,” says Vanessa Hostick, AIA, a sustainable design leader at HOK based in Kansas City, and a self-described “matchmaker” who works across many projects (often the firm’s largest by square footage) to share information and decarbonize HOK’s portfolio. “A lot of our work is with repeat clients, which is true for a lot of firms, and you never ever want to disappoint a



Philadelphia-based firm KieranTimberlake renovated their offices in 2016, turning their workspace into a lab to test decarbonization strategies.

longtime client. But, that doesn't mean you don't have a responsibility to the environment."

On the specification front, Hostick and Faircloth point to databases that cull EPDs including the Better Materials Database, operated by Green Building Certification, or the Embodied Carbon in Construction Calculator (EC3), operated by the Carbon Leadership Forum. Others, like the Quartz Common Products Database and the Cradle to Cradle Certified database, offer a similar array of materials and products for the job site or even the medicine cabinet. The process of reviewing and selecting products based on their lifecycle carbon impacts is admittedly time consuming and sometimes results in what Faircloth calls a conundrum. "If I'm choosing between double-pane or triple-pane glass, I'll see that triple saves operational carbon over the occupancy of the building, but when I look at the carbon emissions of what it takes to manufacture an extra pane of glass, the upfront carbon cost could be hard to justify," she says.

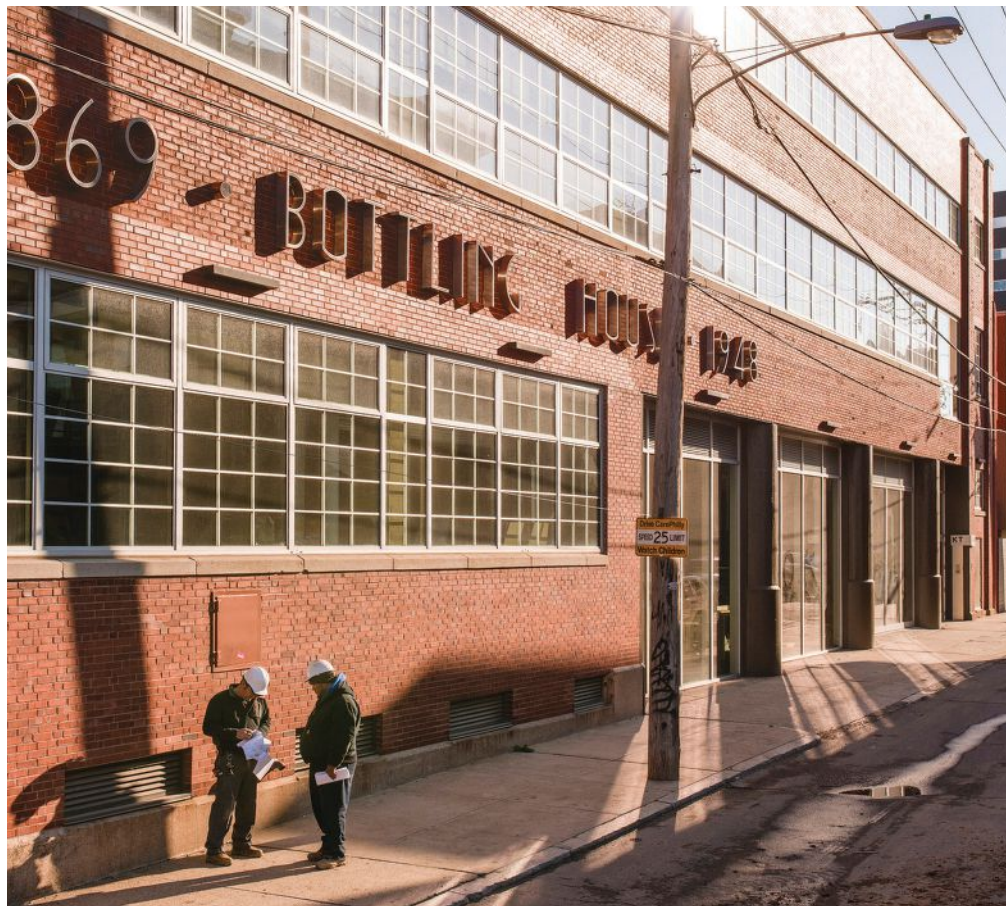
Other observers say that the environmental product declarations that these databases utilize aren't nearly as

reliable as they should be, which adds to the challenge, according to Bill Caplan, ASSOC. AIA, for an industry whose members are too quick to congratulate themselves for thinking about sustainability rather than fully pursuing decarbonization. Caplan is an engineer and the author of *Thwart Climate Change Now: Reducing Embodied Carbon Brick by Brick* (Environmental Law Institute, 2021), and he advocates for databases that are easier to use and that contain more consistent information to create the level of transparency needed to make informed decisions about thousands of commonly used products. But, even if there's a learning curve with these databases, says Caplan, there's value in using them.

"The architects are the ones who detail the building. They're the ones who make real choices at the material level. A client might want the concrete 'look' or 'aesthetic,' but architects can affect the actual material choice. The architect has the ability, even with a client that doesn't care, to choose the low-carbon version of things," he says. "If we are all looking at the numbers, architects can make a difference in the very next thing they design."

Other than adding a step to the design research process, Hostick and Faircloth both say, a commitment to materiality and thinking outside of received wisdom about common products points to architecture's basic precepts of efficiency and doing more (and better) with less of everything. That even applies to the most sacrosanct material of global construction—concrete, the most ubiquitous and arguably most deleterious material ever devised. If concrete were a country, the UN's Chatham House analysts said in 2018, it would be the third largest carbon emitter in the world behind China and the United States and ahead of India. It has been the engine of development as the material of choice in developing countries for its strength, ease of use, degree of skilled labor required, and cost. Once architects (and builders) get into the routine of tracking materials more regularly, then the next frontier is finding, creating, and ideally requiring less carbon-reliant and carbon-emitting alternatives.

"There are also a lot of real cost savings by shrinking the size of a building's systems, and we're starting to see that happen with concrete now," Hostick says.



The exterior of KieranTimberlake's Philadelphia offices.

"Look at how we handle floor slabs now—we're looking at hybrid systems that use timber and concrete to lighten the load and reduce material. When you reduce material, you reduce time, schedule, and cost. We're finally breaking that barrier as we get more comfortable with addressing things like concrete."

After commitment comes financing, which is the inevitable third step in decarbonization at any scale—national, regional, urban, or individual building. In November 2021, the city council of Ithaca, N.Y., unanimously voted to decarbonize all 6,000 of its structures within its six square-mile area. The vote came more than a year after the council's June 2019 decision to pursue a 2030 net-zero carbon plan, which provided the intellectual framework for such a commitment. Alturus, a Boston-based capital investment firm, provided \$100 million for the seed money for the commitment, which has in turn become the operational budget for BlocPower, a Brooklyn-based energy technology company that's overseeing the installation of solar panels, high efficiency heat pumps, electric stovetops, and other measures to reduce operating carbon around the city.

This is the granular level, experts say, that is easy to address and an effort that is easily multiplied.

"Once you get beyond the boundaries of your project, the landscape of action becomes intimidating and daunting," says John Delaney, an architect at Koning Eizenberg Architecture in Santa Monica, Calif., where he coordinates the firm's sustainability efforts and conducts research on policy, construction methods, and materials. "Decarbonization at any scale, for me, still involves picking healthy materials or structurally efficient design. [It also involves] a real understanding of where our energy and fuel comes from and the conversion from fossil fuels to renewables."

One way Delaney, who sits on the Advocacy Subcommittee for AIA California COTE, tries to address decarbonization beyond his projects is by paying attention to calls for public comment and writing letters or participating in public hearings in support of impactful decarbonization policies. "To be involved in decarbonization is to get out of your bubble and engage in the broader regional conversation. I'm not an expert on power grids, but knowledge comes through participation. It's also a great way for small firms and young

professionals to lend their voices," he says.

Even if joining an advocacy team or attending public meetings is tough from an already stretched-thin timeframe for most architects, finding ways to address decarbonization is possible within the work itself. "I think there's another mission, too, in decarbonization, apart from codes and apart from the scale of projects you work on," says Delaney, "which is asking, 'How do we use this challenge to address issues like access to housing?' If we're building these projects to be climate-positive, how can we build them to be community-positive, too?"

For multifamily projects with five or more units, Los Angeles mayor Eric Garcetti announced a \$75 million program called Comprehensive Affordable Multifamily Retrofits that provides low-income tenants access to energy efficiency retrofits, building electrification initiatives, and on-site photovoltaic panel installation. The city's Department of Water and Power also expanded its budget for the Home Energy Improvement Program to fund additional energy and water conservation initiatives totaling another \$75 million. By the end of this year, the Mayor's office estimates that more than 3,000 rental units will take advantage of these options, which is 0.5% of Los Angeles' 600,000 individual rental units, and 4.3% of the city's 68,830 rental units considered low-income. It's a start and it addresses water use, which Delaney notes is profoundly important for Southern California, not to mention the entire southwest now in the throes of what *The Washington Post* recently reported as a record-setting "mega-drought" that's the "worst in 1,200 years."

According to everyone interviewed for this piece, scaling up or down one's ambitions to decarbonize architecture, or even scaling up or down in how it can work in terms of gross square feet, might not be easy or straightforward. But, all it takes is seeing the opportunities every day to create, select, and promote strategies that eliminate carbon emissions by setting targets, making goal acquisition part of normal practice, and advocating—for the personal level and the policy level—for these strategies. Still, if architects are looking for a square-one to occupy in the broader effort to decarbonize design and construction, says KieranTimberlake's Faircloth, it should be adaptive reuse. "Decarbonizing in our industry should begin with reusing buildings. That is the most intuitive step. Let's talk about why we need to be building new to begin with, and then let's make building reuse front and center," she says. **AIA**

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The Burnout Problem in Architecture

For many architects, the pandemic was a tipping point for problems that had long been plaguing the profession.

By Katherine Flynn

Josh Mings, AIA, has vivid memories of how the modern architecture of Columbus, Ind., shaped his childhood. He wandered the stacks at the I.M. Pei–designed Cleo Rogers Memorial Library; ran into the concrete columns placed smack in the middle of the hallways at Fodrea Community School while rushing to class; and marveled at the Brutalist design of the city’s Southside Elementary. There was no doubt in his mind that he wanted to create awe-inspiring structures, too—he wanted to become an architect.

Mings, who has been practicing for 10 years, already had the feeling that he was shouldering an unsustainable workload at a housing firm when the pandemic hit. He’s now taking a leave of absence to focus on his health in the wake of weight-loss surgery that he underwent in August 2020, and he feels unwilling to compromise on work/life balance in a future position. His 60- to 70-hour workweeks were negatively impacting both his physical and mental health.

“By and large in housing, clients demand aggressive scheduling so that they can get the most return on investment,” Mings says. “That causes principals that are chasing the work to agree to deadlines that aren’t suitable to the practice of architecture and actively burn out project architects, staff architects, and emerging professionals—which leads to a profession that cannot sustain itself and damages the mental health of those within it.”

He adds, “We now have to face project timelines that are even more aggressive and unsustainable due to the issues with global supply chain and construction market pricing.”

Architecture is far from the only industry currently facing upheaval. According to the Bureau of Labor Statistics, 4 million Americans quit their jobs in July 2021, and a study from the *Harvard Business Review* found that resignation rates were highest among midcareer employees (those between 30 and 45). Wide swaths of workers are being spurred to reconsider their priorities.

Within architecture, calls to organize

for better working conditions—like the unionization push at SHoP Architects at the end of 2021—are initiating honest conversations about long hours, compensation, and a lack of diversity that makes it challenging for architects of color to feel accepted. The murder of George Floyd in May 2020 and the racial reckoning it instigated across American culture only added a further breaking point in terms of stress for many architects of color.

The crisis is real, and it’s supported by data. Monograph, a company that makes project management software for architects, surveyed 225 architects in 2021: 96.9% reported that they were experiencing some form of burnout.

A Tipping Point

Burnout is not a medical diagnosis, according to the Mayo Clinic—rather, it is a compendium of feelings of depression, a general lack of well-being, and even physical symptoms like shortness of breath. It’s a side effect of many creative jobs, but architects are particularly susceptible due to the rigorous nature of their work.

According to the Monograph study, the COVID-19 pandemic didn’t cause burnout for architects, but it seems to have made it worse. Of the architects surveyed, 87.1% said that their burnout increased during the pandemic. This tracks with the experience of architects like Mings, as well as that of Patricia Acevedo Fuentes, AIA, who left traditional practice a month ago after realizing that she could no longer cope with long hours and a culture that, as a Latina woman, she found challenging. She now works for a developer and her work/life balance has greatly improved.

“I was working 55 to 60 hours a week,” she says of her pandemic workload. “There was no break—there was no light at the end of the tunnel.”

The increased hours became additional to what Acevedo Fuentes felt like had been an unofficial title throughout her career: equity, diversity and inclusion consultant.

“I was doing two jobs, because the white people were not doing the work and they

were expecting me to educate them,” she says.

As the murder of George Floyd coincided with the beginning of the pandemic, Acevedo Fuentes explains, the focus was on equity, diversity and inclusion. “Everybody [was] talking about EDI and centering the human experience in the work that we’re doing. But because we were remote and Zooming in and out of meetings, I feel [like those discussions] fell to the wayside.”

“I would be shocked if people of color weren’t leaving [the profession] in this moment,” she says.

How to Move Forward

The shock waves currently being felt in architecture have the potential to impact what the profession looks like for years—even decades—to come. At the principal and firm-owner level, finding qualified applicants has become a challenge.

“I feel like I get a call every other day about a project,” says Mark Gardner, AIA, principal of Jaklitsch / Gardner Architects, a small boutique firm in New York. He can’t hire fast enough to meet demand for the amount of work that’s coming his way and the number of potential clients that are looking to fast-track projects to get out in front of potential supply chain challenges or price increases that may lay ahead in the coming months.

“I was talking to some younger friends in architecture who were talking about their friends who had left the profession during the pandemic, and we’re really feeling it,” Gardner says.

For those who have recently completed architecture school, it can be tough to see the value of licensure. One 2020 graduate, who prefers to remain anonymous, is reconsidering their commitment to the profession in light of the turmoil they have experienced entering the job market. They are struggling with the decision to spend “so much time and effort studying for the licensing exams on my own time and spending what little money I have saved for a career that is on such shaky foundations,” they say.

“I talk about this topic with my

therapist often—my conflict between wanting to practice good architecture but not feeling like I can have a secure future with the work/life balance I want,” they say. Hesitation to enter to a profession that has the potential to cause burnout is a valid concern—and one that the profession needs to reckon with if it wants to effectively address pipeline issues.

While there is no singular solution for the problem of burnout, acknowledging the multifaceted problem is a place to start.

“Strides are being made in equity, diversity, and inclusion [in architecture]—but these are all for nothing if overwork, unsustainable deadlines, and workloads remain,” Mings says.

For architects like Acevedo Fuentes,

however, overwork was just one facet of her frustration—progress in areas of EDI isn’t happening quickly enough to keep architects like her in the profession.

“It’s so easy to brush me aside and say, ‘Oh, well, she just wasn’t cut out for it,’” she says. “And we [women and minorities] hear that so much, but that’s not really the problem.” **AIA**

A I A P E R S P E C T I V E

Showing, Not Telling

By Dan Hart, FAIA, 2022 AIA President

On Earth Day 2022, the planet is in crisis. From climate change and the continuing pandemic to senseless violence on multiple continents, the scope of challenges we face is daunting. We, as architects, naturally want to help. We’re charged with building a healthier and more equitable, sustainable world. But where do we even begin?

I have a simple suggestion: Be relevant.

That’s exactly what we did as the COVID-19 crisis unfolded in 2020. AIA architects went immediately into action—providing services, knowledge, and tools to help organizations and communities not just survive, but thrive.

Firms contributed resources and 3-D printing technology to produce protective masks. Special AIA task forces took action to coordinate with public officials on safely adapting existing buildings into health facilities—issuing expert guidance that was distributed by the State Department. In a series of virtual charrettes, AIA convened architects, public health experts, engineers, and facility managers for our Reopening America initiative.

I believe our work in 2020 will be remembered as one of AIA’s finest moments. We were relevant because we engaged where society needed us most—by showing, not just telling, how we could help. When we are relevant, we become valuable. When we are valuable, we have opportunities to prosper as a profession. We can do well as we do good.

That lesson applies to our dual institutional priorities: sustainability and equity.

We know that 40% of carbon emissions come from buildings. That alone makes us relevant and gives us agency in addressing the existential challenge of our day.

And AIA offers so many avenues and tools to make a difference.

Under the 2030 Commitment, we’re working to make sure all new buildings and major renovations are carbon neutral by 2030.

Obviously, that’s a big goal. You might think your firm isn’t big enough, or your city isn’t influential enough to make a dent in that goal. But here’s what you can do: Be relevant.

You can’t single-handedly make your city carbon neutral. But you can join an AIA Knowledge Community. And join the 2030 Challenge if you haven’t already. We have just achieved 1,000 signatories, and you can help us reach 2,000.

Check out AIA’s Framework for Design Excellence, and ask how your design can be more effective. Pick one project, and see how you can apply principles from any or all of the Framework’s 10 measures. The Framework’s measures include ecosystems, water, energy, equity, well-being, and—simply—change.

Speaking of platforms, AIA’s Advocacy page on AIA.org has a policy platform setting out our priorities—including infrastructure, resilience, sustainability, equitable communities, and affordable housing. You can weigh in on important legislation with the click of your mouse. Or better yet, attend a Lobby Day, like the one we’re hosting—both virtually and in person—this month.

Do you have clients who don’t show interest in sustainable design? Maybe one of the measures from the Framework provides an entry to the conversation. Is your mayor not committed to building equitable communities? Maybe they don’t realize the possibilities.

AIA has tools to explain design solutions addressing all these urgent challenges—from the climate crisis to racial injustice to the pandemic.

Our Blueprint for Better campaign site has a page devoted to tools and resources where you’ll find talking points for engaging with civic leaders. And you’ll find sustainability resources like the healthier materials protocols, a primer on renewable energy, and our guide “Design for Adaptability, Deconstruction, and Reuse.”

You’ll find case studies illustrating how community-centered design has transformed neglected neighborhoods into thriving spaces that promote health, equity, and opportunity.

Another great resource for showing design solutions in action is AIA’s Film Challenge. If you ever need to convince anyone in your community of the power of design, employ compelling stories by showing them a clip from a Film Challenge entry.

That’s what we’re all about, as architects, isn’t it? Demonstrating. Illustrating. Showing. Not telling.

We combine the technical skills to transform spaces, and the creative and visual skills to share our vision. Design is our superpower.

That’s how we can get the buy-in we need from clients, from partners, and from local leaders to achieve our vision.

But they won’t know we can help unless we’re in the room, at the table, on the front lines.

Let this Earth Day be a reminder: Architects can help. Let’s be relevant. **AIA**



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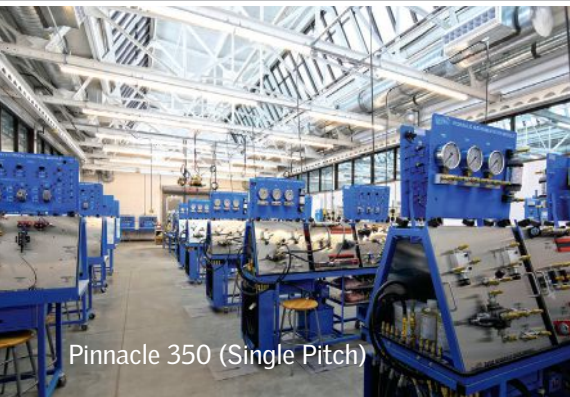
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Architect: BNIM | Photo: © James Ewing/JBSA



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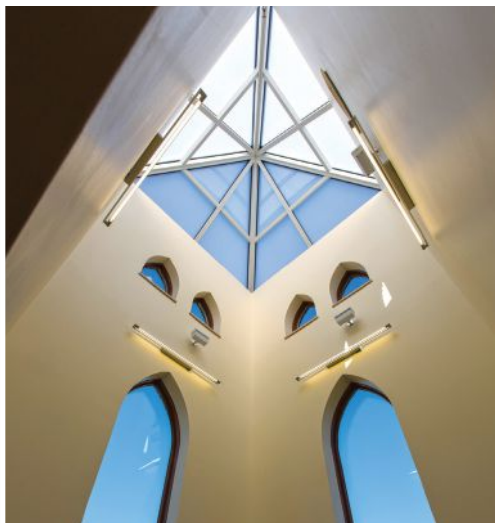
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Cassandra Voss Center, St. Norbert College

Horizon S-Series and V-Series translucent daylighting systems transform a dilapidated 1883 church into a vibrant learning environment.



The polycarbonate glazing reduces both thermal loss in the cold months and solar heat gain in the warm while filling the space with diffused natural light.

CHALLENGE

Convert a dilapidated 130-year-old church on the St. Norbert College campus in De Pere, Wisconsin, into a vibrant and collaborative learning environment for Women's & Gender Studies. The Cassandra Voss Center is about reflection but also connection to nature, to the campus and to each other.

SOLUTION

The skylight and wall systems were glazed with clear multiwall polycarbonate. The skylights are filled with aerogel for diffused daylight and energy efficiency.

Location

De Pere, WI

Project type

Refurbishment

Year of construction

2013



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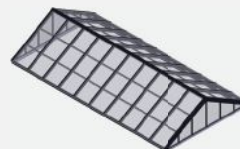
Products used in project

Bell Tower: An 8' x 8' square pyramid S-Series skylight with the Pinnacle 350 framing system, glazed with Lumira® aerogel-filled polycarbonate.



Pinnacle 350 Square Pyramid

Front Atrium: S-Series Pinnacle 350 Double-Pitch Skylights glazed with clear polycarbonate panels, also filled with Lumira aerogel. The V-Series wall system is glazed with clear polycarbonate.



Pinnacle 350 Double Pitch

This translucent, lightweight, interlocking tongue-and-groove panel wall system has large-span capabilities and easy installation and requires no UV maintenance.



Translucent Wall System
Horizon V-Series

[UN]STA



The inclusive restrooms in the I. King Jordan Student Academic Center at Gallaudet University in Washington, D.C., provide users with 22 gender-neutral stalls in various sizes, each carefully designed to meet the needs of all students and visitors.

ALLED

inclusive bathroom design

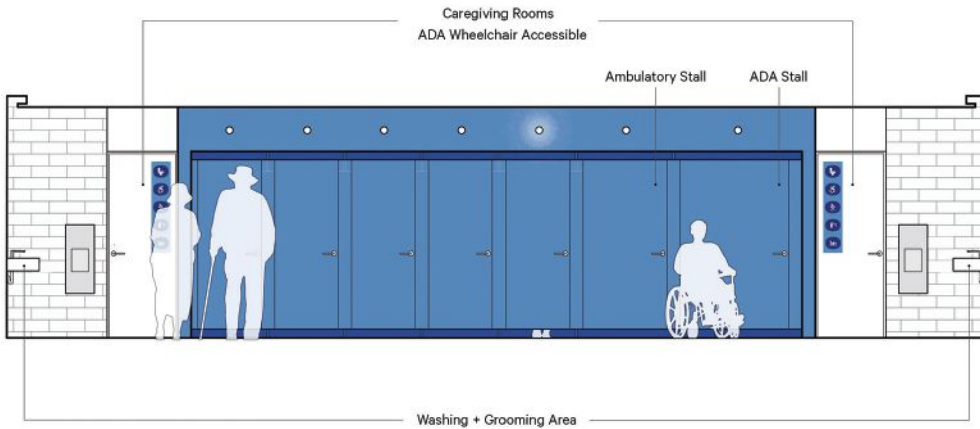
TEXT BY ANNE QUITO

For all their good intentions, “accessible design” solutions can sometimes make things worse. Wheelchair ramps and lanes reserved for people with mobility issues, for instance, can unintentionally create stigma. Often conceived as accommodations or alternatives, these solutions run the risk of spatially isolating users and further perpetuating discrimination.

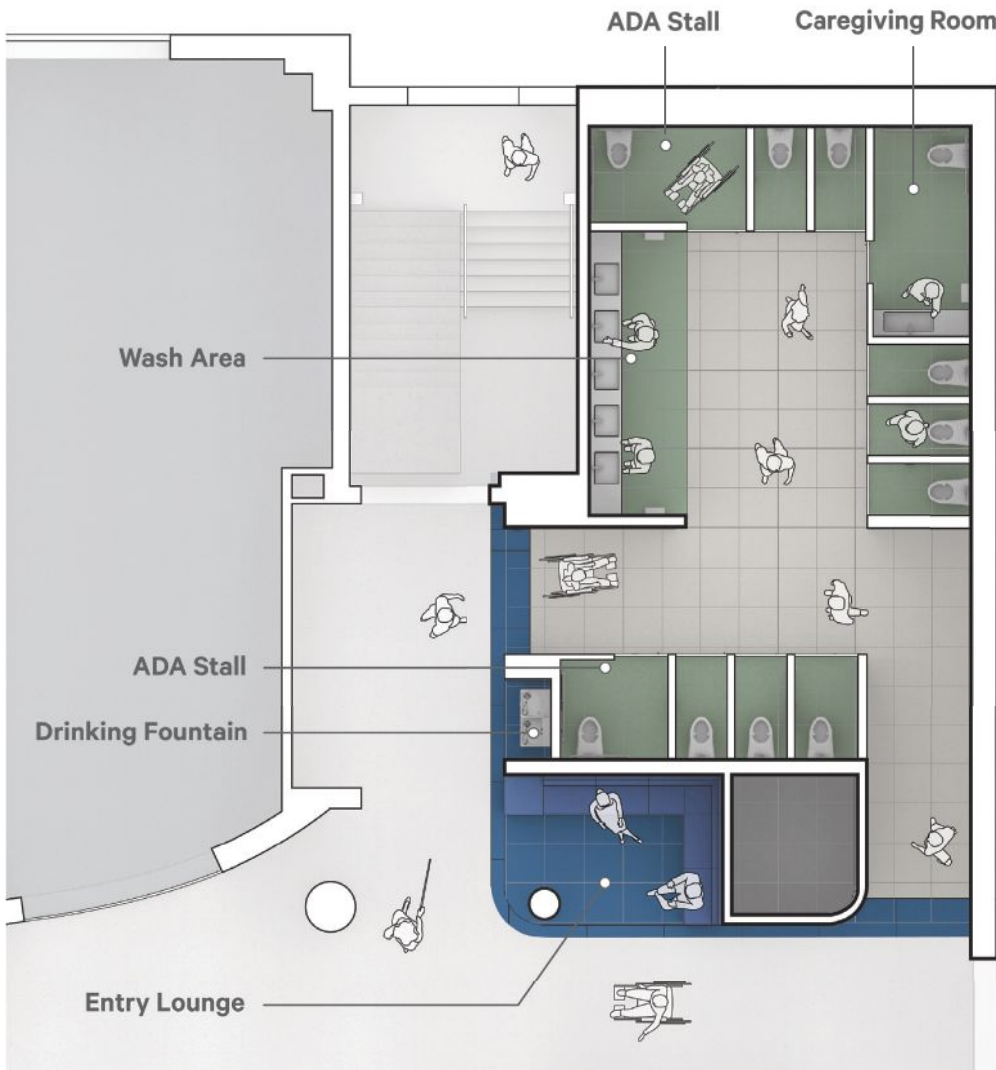
The problem can largely be traced to architecture’s narrow understanding of the lively diversity of its users, says Joel Sanders, FAIA, co-founder of the New York-based think tank and design firm MixDesign. “Since antiquity, the body that architects have been designing for in the West has generally been assumed to be white, able-bodied, cisgendered, heterosexual, and until recently, male,” he says. Anyone who deviates from the Vitruvian ideal is flagged as a special needs case.

Many failures of accessible design are manifest in public restrooms. Sometimes poorly conceived, the everyday necessities can become





A restroom section highlights the variety of stalls available (left); floor plan for one of the Jordan Student Academic Center inclusive restrooms (below left).



DIAGRAMS BY JSAL/
MIXDESIGN; PHOTO BY
JEFFREY TOTARO

“We think of the restroom as a kind of **social condenser** and an animated hub. It sends a signal: Health, **wellness and well-being**, and inclusivity are important to our university.” — JOEL SANDERS



Finished in a palette of calming shades, durable tile flooring, and fixtures from American Standard, Elkay, Bobrick, and Koala Kare, each restroom comprises 11 individual stalls.

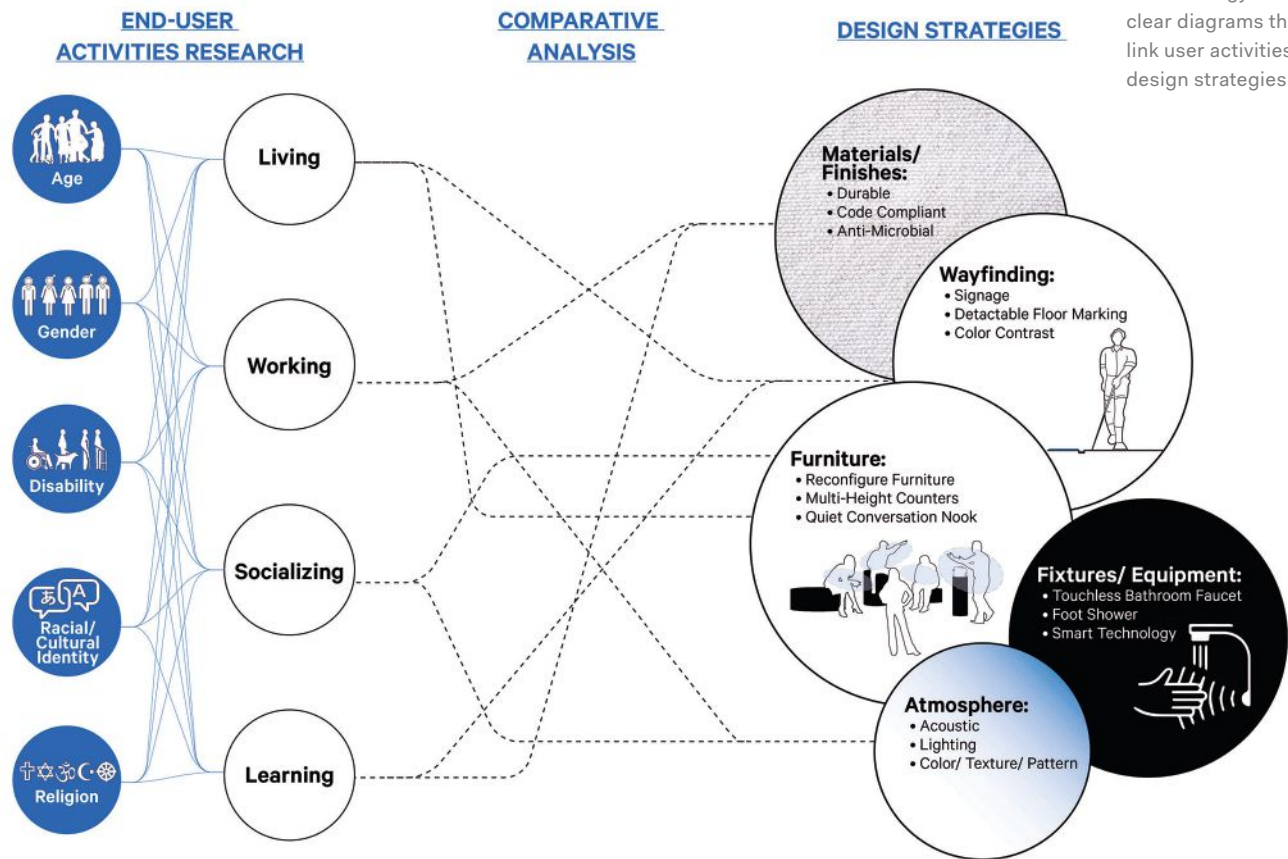
spaces where “architecture, through its codes and conventions, naturalizes lots of cultural assumptions about human bodies and identities,” Sanders contends. A professor at Yale University, he founded MixDesign with transgender studies pioneer Susan Stryker and University of Utah law professor Terry Kogan in 2017 “to combat architecture’s complicity in reinforcing structural racism, heteronormativity, and ableism.”

MixDesign espouses an “intersectional approach,” explains Sanders. In designing accessible spaces, the firm goes beyond physical disabilities emphasized in the Americans with Disabilities Act and delves into culture, gender, and the myriad neurodiverse factors that shape our experience of the world. MixDesign’s ongoing research project called Stalled! has yielded prototypes and recommendations for creating truly inclusive facilities.

MixDesign’s rethink of gender-neutral bathrooms at Gallaudet University’s student center in Washington, D.C., demonstrates this philosophy. After conducting several design workshops with students, faculty, and administrators at the 157-year-old school for the deaf and hard of hearing, the firm conceived a duo of open-plan restrooms—each approximately 950 square feet and containing 11 stalls—where users of all needs and temperaments can be comfortable.

Sanders says that an open layout creates “potty parity” and solves the dilemma of having long queues in one of the gendered bathrooms. Crucially, it also improves safety, explains Sanders, citing Jane Jacobs’ “eyes-on-the street philosophy” where a crowd proves to be the best deterrent against violence in public spaces. This is particularly critical for trans women of color, who have been assaulted in public restrooms.

Creating a sense of privacy was also a priority. MixDesign installed ceiling-height cubicle doors instead of short and flimsy partitions, with visible



MixDesign explains its methodology through clear diagrams that link user activities to design strategies.

gaps, common in American bathrooms. Rather than a row of identical stalls, MixDesign introduced a variety of cubicle sizes and layouts: standard stalls measuring 3'-6" x 5'-2"; ADA-compliant stalls measuring 6'-10" x 5'-2"; and larger stalls measuring 10'-2" x 5'-6". Dubbed "caregiving rooms," these larger stalls are equipped with a toilet, sink, and mirror to accommodate those who require complete privacy, including those with paruresis, or "shy bladder syndrome," who find it difficult to urinate in public, Sanders adds.

"There is no such thing as truly universal design," Sanders points out. "Some populations have separate privacy needs or religious needs that don't allow them to share [spaces]." The architect's calling, he argues, is to find a "balance between sharing and respecting differences."

Another notable feature of MixDesign's scheme is positioning the restrooms in high-traffic areas within Gallaudet's I. King Jordan Student Academic Center. Instead of tucking them away at the end of long corridors, the two facilities are adjacent to the building's entrances and offer lounging spaces for students to wait their turn or simply hang out. MixDesign sought the school's guidance

on designing "deaf spaces" and selected high-back seating upholstered in shades of blue that complement universal skin tones; the color contrast improves visibility for people using sign language.

"We think of the restroom as a kind of social condenser and an animated hub," Sanders says. "It sends a signal: Health, wellness and well-being, and inclusivity are important to our university."

"We are thrilled with the newly constructed inclusive public restrooms," concurs Elizabeth Brading, Gallaudet's executive director of campus design and facilities, who worked closely with MixDesign. "It showcases Gallaudet University as a pioneering institution with an ongoing commitment to meeting the needs of a diverse campus community."

Ultimately, Sanders says, designing spaces for accessibility means working closely with people with lived experience of the issues at hand—a feedback loop that architects traditionally deprioritized or avoided. "I'm trying to unlearn everything I was taught about being an architect and learning to listen," he says.

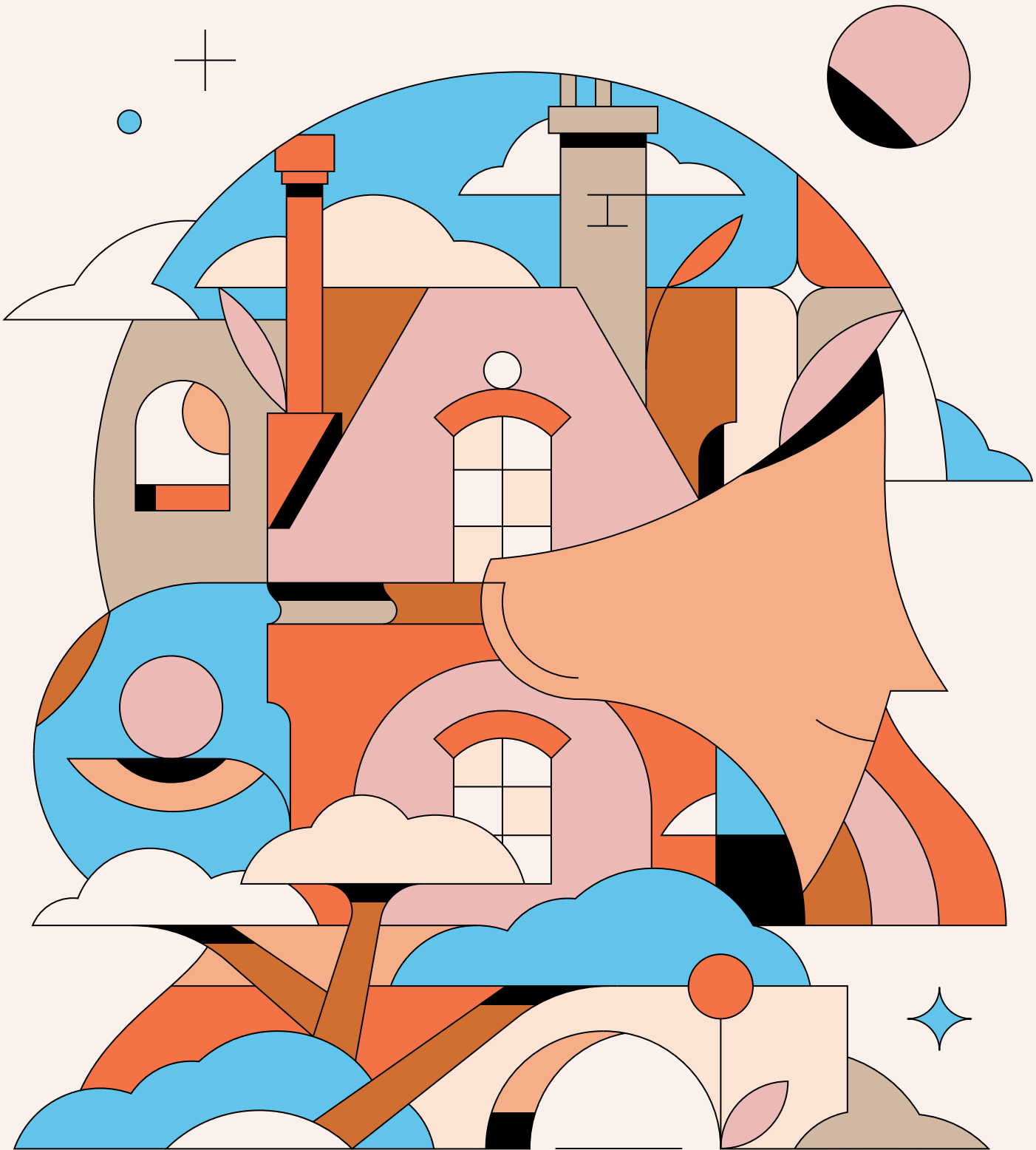
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TEXT BY IAN VOLNER

PARADIGM, Interrupted



How a shift in attitudes about mental health is changing not only how we design for well-being, but also the inner workings of the architecture field itself.

When it comes to designing for mental well-being, the architecture profession has been more than a little remiss. For all their obsession with health and cleanliness, only a few of the 20th century's most influential designers ever ventured into creating spaces for psychological healing, and then only within the prescribed boundaries of the era. Take Otto Wagner's 1907 Steinhof Psychiatric Hospital in Vienna: While the mental health facility was remarkable for its time—a village-like compound of 60 pavilions surrounded by green spaces, with a striking, Art Nouveau church at its center—it was still an old-fashioned asylum, a typology now long obsolete.

For today's architects, the relative silence of their forebears has left a void in need of filling, while radical changes in the field have given designers that much more catching up to do.

"Not enough people have addressed this in the built environment," Erin Peavey, AIA, says. With an academic background in both psychology and architecture, Peavey, now a design researcher at the Dallas-based firm HKS, focuses on the thin and sometimes fuzzy line where space and the subconscious interact, a still-emerging science that is more prescient now than ever before, especially in light of the pandemic's global effect on mental health.

"So many more of us are now working from home," Peavey says. "This is not having a great impact on our mental health."

Statistics bear out her point: In the early stages of the COVID-19 outbreak, the CDC released a study demonstrating that at least 40% of Americans had experienced adverse psychological effects as a result of the pandemic and its fallout. In response, experts like Peavey and her colleagues have been endeavoring to create projects that “really resonate with us biologically,” as Peavey puts it—projects like HKS’s Floral Farms, an upcoming public space in Dallas that includes secluded bowers, community programming, and plenty of lush greenery, all calculated to soothe, stimulate, and restore the frayed nerves of cooped-up locals.

That kind of holistic thinking shows how much mental health design is moving beyond the clinical space, touching every corner of architectural practice. There’s a reason for that: As noted by Francis Pitts, FAIA, founder of the Troy, N.Y.-based Architecture+, both everyday and treatment-focused environments involve “the same sensibility—you’re designing for a human being, first and foremost.”

Over the course of the last 30 years, Architecture+ has made a specialty of mental health facilities, having designed more than 150 of them across the country. And yet Pitts says that the motivating principles behind such projects are no different from those behind any other typology. “Most people see mental illness and they see only the roles of patient, doctor, and nurse,” Pitts says. “They fail to see the people.”

In two recent mental hospitals, the Vermont Psychiatric Care Hospital and the Wyoming State Hospital, the Architecture+ team looked to cater to basic human needs for privacy and convenience, eschewing the alienating double-loaded corridor model in favor of more intimate, suite-based patient rooms, and then filling each domicile with built-in furniture, cozy niches, and more.

Driving the change in mental wellness design today is a fast-changing understanding of what exactly happens in the minds of anyone, from

From top to bottom: The Healing Spirit House in British Columbia by HDR; the Behavioral Health Pavilion by Architecture+ at the Nationwide Children’s Hospital in Columbus, Ohio; the Spero Academy by HDR in Minneapolis



patients to office workers to stay-at-home parents and their kids, as they interact with the world around them. At the Spero Academy in Minneapolis, the Los Angeles office of national firm HDR created a school for children with autism and special needs that reflects up-to-date research into the sensitivities of neuro-atypical students.

“The project is designed for the senses,” says HDR’s Anosha Zanjani, the LA behavioral health design specialist. As studies have shown, sudden changes in noise, lighting, and other external stimuli can be distressing to autistic children, and so the Spero Academy features carefully calibrated transitions between different aural and visual zones, providing time and space for students to acclimate to their surroundings.

Healing Spirit House, another project from Zanjani’s team, in Coquitlam, British Columbia, includes art and design motifs based on the cultural traditions of the Kwikwetlem First Nation who live near the mental health facility.

“This facility serves both Indigenous and non-Indigenous youth and their families. However, with a location on Kwikwetlem First Nation ancestral territories and a demand for care for this population, cultural practices were intentionally embedded within the treatments and the design of the facility,” says Zanjani, citing information from extensive post-occupancy surveys and other sources proving how members of marginalized groups, and Indigenous communities in particular, often experience negative emotional responses to the cold, sterile atmosphere common to so many institutional buildings. “It’s so important to foster a sense of belonging.”

Taking the data and insights from clinical psychology and integrating them into architectural practice is a pressing imperative, according to Frederick Marks, AIA, founding board member of the Academy of Neuroscience for Architecture, an organization advocating better and more comprehensive mental health design.

“It should start with architecture schools,” Marks says. “Social and cognitive science should have some impact on what’s being taught.”

Inasmuch as architects have always sought to create buildings conducive to human flourishing, the profession has never really had objective, quantifiable metrics for determining the success or failure of a given design. Now, Marks says, sophisticated instruments like EEG brain-analysis devices and computer eye-tracking scanners make it possible to study an individual’s response to their environment in real time. While assimilating these innovations will likely take time, Marks does note that firms like HKS and HDR are hardly alone in keeping mental health specialists on



Rosa Sheng Unpacks Social and Spatial Wellness

To better understand the intersection between equity and wellness in the architecture profession, Madeleine D'Angelo interviewed Rosa Sheng, FAIA, SmithGroup vice president, higher education studio leader, and director of justice, equity, diversity, and inclusion, and the founder of Equity by Design.

Q: Wellness can be a buzzword these days, so how would you define it for the architecture profession? Why does wellness matter?

I have my own biases about what wellness means, as does everybody, but if we take it back to its architectural context, the charge of licensed architects is to foster the health, safety, and welfare of society at large. That’s our stewardship. So, I started off with the definition of what welfare means. And when we think of welfare, it’s a triggered word because we think of government subsidies. But the first meaning of welfare is the state of doing well, especially through happiness, well-being, health, and prosperity, so it’s like a holistic wellness. There’s a focus definitely on the mental and physical health side, but then we don’t really think about the social determinants that would affect wellness. In short, I’d like to get away from the word wellness, because I think it’s too monolithic and already triggered. I’d like to talk about well-being and welfare, in terms of health, safety, and welfare for architects, because I think architects, while they know that’s their charge, there isn’t that unpacking of it.

Q: What does it look like to work in firms that promote wellness?

In order to unpack a singular word into its deeper meaning, I think we could look at research on the eight dimensions of wellness: emotional, physical, environmental, intellectual, occupational, spiritual, social, and financial. All those make up the wheel of wellness that affects a person’s quality of life and their ability to thrive and be successful. So what’s that secret sauce? What’s actually the business value proposition?

The business value proposition is that if you don't have people who feel like they belong and that they're psychologically safe to contribute, not only is there a loss of creativity, but it's also a loss of engagement and productivity. Especially with architecture and engineering fields, we have to be problem solvers. And so that sense of belonging is that core. You feel comfortable, and then that translates into your ability to contribute, then that allows for cooperation with other people in that aggregate and collaboration. You can't have collaboration without that kind of fallback of that sense of belonging and psychological safety as your core founding.

From a culture that generally focuses on self-focused well-being, the greater reinforcement of well-being is when we help others. Our sense of well-being also improves; the satisfaction of seeing somebody else improve is equally as important as the daily self-related well-being.

Q: Where does equity fit in? Do equitable workplaces and wellness-focused workplaces go hand in hand? If not, what are the equity-related blind spots that design professionals miss in the conversations around wellness?

I'd like to also expand [the word equity] because it's become a catch phrase and watered down. So defining equity, justice, and even equality; it's really a mindset. Equity is a good word to start with because it acknowledges that there are policies, practices, and culture in place that have historically harmed people or made people feel uncomfortable. That's a core part of equity: not to say, nothing's wrong or minimize it. In order to have that well-being philosophy grounded, we also have to consider the breadth of lived experiences.

In terms of people performing at their optimum, feeling trusted or trusting other people, there are certain

messages that firms send when they say, "Oh, we're all about equity, we say the word and it's in our brand." But then when the reality hits of how do you demonstrate equity or justice in your practice? I think that's where there's a lot of improvement to be made. And there are several layers of that, right? So there's education, cultural cultivation, change management, changing the narrative, and also advocacy. How do we become champions [of others] when we know policies and practices are not only outdated but prevent people feeling that they're safe and that they have that sense of belonging to how they engage and their ability to be their optimal selves?

Q: Does working in offices focused on employee wellness help architects and design professionals better design spaces promoting wellness for users?

What we're trying to do at SmithGroup is translate representation—or the lack thereof, and improve upon it—into this holistic idea of well-being and optimizing high-performing teams in the workplace. Then that translates into us being directly empathetic to the communities that we serve because we have representatives who actively know the lived experience of the users to reach out, to listen, and to teach their co-workers. To be comfortable saying: "Hey, we don't know everything about this community that we're designing for. We haven't considered the working mom who needs to pump twice a day. We haven't considered the neurodiverse person that needs the quiet room to decompress from the stress of just interacting with people and overstimulation."

That's where equity as a framework comes in, expanding one's mindset, developing what's called intercultural intelligence. We know of emotional intelligence—how to read people in the room and if they're stressed or not—but then there's another evolution, which

is how do you understand and build competency of the various cultural backgrounds. But also understanding the lived experience that somebody has come from—whether an underserved population or if somebody is actively experiencing basic needs challenges.

When employees see that organizations lead with mission and purpose, and that profit is secondary as a result of mission and purpose, there is a greater sense of trust, and that sense of psychological safety, and therefore belonging, when there's an alignment of core values with the individual and the organization.

Q: The recently released "An Elephant in the 'Well-Designed' Room: An Investigation into Bias in the Architecture Profession" study highlights bias that architects—non-male architects and architects of color—face in the workplace. Do traditional wellness practices tend to prioritize the wellness of one group of employees over the other?

More abstractly, it's an education process: Applying best practices of the Lean Enterprise Institute, studies about high-performing teams, and research such as *The Five Dysfunctions of a Team* by Patrick Lencioni (Jossey-Bass, 2002). Essentially there's a pyramid, the foundation of which is to build trust or psychological safety.

I think the study went into a deeper dive of these nuances, but most people know these problems exist. The important thing is to apply these best-practice principles but with an overlay of intercultural competence. So how do you trust people from different cultures and lived experiences? It's fostering the opportunities to get to know those people on an individual level. And that takes time. A mantra that I try to practice is moving at the speed of trust. I'm not going to convince somebody to do something, or try something new, or believe in my design idea, unless I've built that trust with them.



The 25-bed Vermont Psychiatric Care Hospital by Architect+ features two yards to provide space for outdoor activities for the community of patients and staff.

staff, with other major offices like Gensler and CannonDesign also adding trained psychologists to their rosters. “That’s very good news,” he says.

While important advances are happening in the design of mental health facilities, and the health of the built environment in general, there does remain one major area in which architecture still faces a rather steep climb: Mental health within the profession. This issue was evident during the “The Impact of Mental Health & the Environment” conversation at the 2022 AIA Grassroots leadership event in February.

Korey White, AIA—a senior associate architect and planner at the Chicago office of DLR Group and leader of the AIA Strategic Council’s 2021 mental health work group—helped lead the conversation. She says the number of attendees at the virtual event, and the frankness with which they spoke about their own mental health struggles, was unprecedented. While she’s unaware of any large-scale studies of mental health and workplace culture for the architecture field, she explains that the AIA has identified mental health as an important issue that it is exploring incorporating into a variety of resources, including potentially the Guides for Equitable Practice. In the meantime, she says, many firms are taking the initiative to get ahead of the issue.

At HDR, that means a wellness program and flexible work arrangements. Two years ago, HDR also brought in Abraham Carrillo as its global inclusion and diversity director who

oversaw the creation of “employee network groups,” including supportive groups for people of color, veterans, women, young professionals, and the LGBTQ+ community—Zanjani also collaborates with these groups to raise awareness and educate about mental health.

“There’s this old belief that to be an architect, you have to give up your life and be permanently stressed,” says Sophia Sparklin, AIA, founding principal at BSPARK Architecture of Great Falls, Mont.

“Working through the weekend has been considered a law of physics,” Sparklin says. Architecture itself—the realm of the fluorescent-lit, open-floor office with the whirr of the laser cutter and the whoosh of the espresso machine—has too often neglected the mental well-being of its own practitioners; in that connection, Sparklin has been an active campaigner for reform in her role as a representative to the AIA’s Strategic Council, presenting a report last year that included structural as well spatial recommendations for improving working conditions in design. Little things like better acoustics, dedicated privacy suites, and adaptable workspaces have already produced a more comfortable office atmosphere for Sparklin’s staff, and the architect is eager to see her colleagues take steps likewise aimed at curtailling the burnout that seems increasingly endemic to the field.

“If we don’t do something about it in our profession, people will stop joining it,” she says. “This is a wake-up call.”

The

TEXT BY ED KEEGAN


LIBRARY

as Intercommunity Hub

ANNAPOLIS, MD., PLAYED A MORE PIVOTAL ROLE

in the early life of the United States than most know, serving as the nation's capital immediately following the Revolutionary War. In 1783, George Washington resigned his commission as commander-in-chief of the Continental Army in the Maryland State House in the city's downtown, a moment in history that lives on in the words of his resignation speech, now on display on custom panels over the "nave" of the new Michael E. Busch Annapolis Library in Anne Arundel county.

"Washington's act of resigning his commission is perhaps one of the greatest acts of selflessness and service in our brief American history: the idea that the individuals and the entities (military, in this case) selected to lead our nation do so in service to the larger American community," says Jeremy Kline, AIA, a principal with local firm WGM Architecture and Interiors. This library's "core mission is service to the Anne Arundel community, and this quote hopefully reinforces some of those parallels to the library customers."



The cloud light fixtures suggest that the children's area is its own world within a world and a place for imagination and exploration, Louis Cherry says.

Serving community of all ages and socio-economic backgrounds is at the heart of the new library design, created collaboratively by WGM, the New York–based Margaret Sullivan Studio, and Louis Cherry Architecture of Raleigh, N.C. The library’s straightforward single-story brick, glass, and limestone structure provides a thoughtful solution that empowers its users.

“We have learned that we need a variety of spaces that can be adaptable and flexible in order for the 21st-century librarian to successfully serve the community,” Margaret Sullivan, AIA, says.

“In terms of need in Annapolis—the city and county are tales of two very different experiences,” says Christine Feldmann, the director of communications for the Anne Arundel County library system. While there are areas of tremendous wealth, she explains, homeless levels are on the rise.

“Our library system is about leveling the playing field for all in our community by providing resources, programs, and materials that help transform lives,” Feldmann says.

The designers strove to imagine the possibilities around creating library spaces that were community driven and rooted in the customers’ experiences.

“[The] library has always been about information, about stories,” says Rudy Rodela, chief technology officer for Anne Arundel public libraries. “As long as people have stories to tell and ideas to share, they’ll need a place to do it.”

While books still hold a special place, they’re just one part of an integrated series of spaces that all support the active sharing of stories and ideas—in every form. Areas like the maker space and innovation tech zone—which includes computers, sewing machines, video and memory lab equipment, and a portable 3-D printer—invite users in.

“This maker-innovation tech zone was designed to be open so that community members can see the innovative and creative activities,” says Sullivan, explaining that it is strategically located next to the teen area. “Often teens are the early adopters of these technologies and can serve as ‘teachers’ to adults and youth.”

Sullivan says they also wanted to design for the unexpected, which includes flexible spaces that transformed, most recently, into a vaccination site. Spaces for public collaboration were identified early in programming as important missing elements that the community desired. The designers also incorporated the

concerns of local initiative Poverty Amidst Plenty. “The need to have the variety of meeting spaces distributed around the building supports potential partnership opportunities evolving to serve basic social and essential resource needs,” Sullivan says.

The building is organized around a central mass with clerestory windows rising two stories on the north–south axis. The lobby contains a light-filled café and directly serves the community meeting room while leading to the center of the two-story-tall “nave,” as Louis Cherry, FAIA, refers to the central double-height daylit space. The nave is meant to recall the great public reading rooms of traditional libraries, but “it isn’t a reading room in the sense of tables where people sit with their lamp and read,” says Cherry, but rather an activated space where books are part of a mix of activities.

“We galvanized all of the spaces around the ‘intergenerational living room’ in the center of the nave,” Sullivan says. “That enables families to have a place to come together and then allows folks to go their separate ways to the different areas dedicated to their learning experiences.”

Kline likens the progression of the nave to the progression of life, from child spaces in the north, teens in the middle, and adults at the south end.

The design integrates an acoustical progression as well. “We ran acoustical models to understand how the big, open space would still be pleasant acoustically,” Kline says. This study led to moving the children’s space off the main axis to reduce the transmission of direct sound into the nave, which also employs absorptive materials.

Different ceiling heights, colors, and varying finishes provide visual cues for different activities. “The materiality gives you the



“We ran acoustical models to understand how the big open space would still be pleasant acoustically,” Jeremy Kline says. “As the anticipated largest source of origin noise, the children’s space is pulled off axis to both reduce the transmission of direct sound into the nave and introduce greater amounts of reflection between the noise source and ‘quieter’ areas farther down the nave.”





The Margaret Sullivan Studio wanted to focus the design as a reflection of an alternative education approach that promotes project- and mission-based learning; learning through teamwork and interaction; intergenerational learning; and self-directed learning.

permission of how to behave,” Sullivan explains. “We use flooring and ceiling materials to reinforce zoning.”

Hard and resilient surfaces provide flexibility and durability at the entrance, contrasted with the more homelike use of carpet in the nave. Durable and easily cleaned marmoleum appears in areas like the maker space to give similar signals. And the quiet reading and special collections rooms have a wool carpet that depicts an archival floor plan of the State House based on original blueprints, denoting these areas as unique spots for reflection.

Beyond Washington’s resignation speech in the nave, the designers explored different aspects of Annapolis’ history that could be presented throughout the building. Stone tile in the entry depicts an 1895 nautical survey map of nearby Chesapeake Bay. Engaging seafaring and colonial histories provide narratives that depict Annapolis’ experience and can be teaching tools for visitors of varying educational levels.

Similarly, light fixtures help identify each space. Whimsical cloud lighting hangs over the children’s stacks and clusters together over the children’s activity area, suggesting, as Cherry puts it, “that the children’s area is its own world within a world and a place for imagination and exploration.” Fixtures for the teen area, the maker space, and the adult area lean more sophisticated, and geometric, primarily circles and linear bars to emphasize volume. “Those make a big impact on how people perceive the different areas,” Kline says.

The Michael E. Busch Annapolis Library is smartly designed for community resilience, to sustain the library’s age-old relationships between readers and books while fostering connections amongst neighbors and generations.



Exploring Sustainable Architectural Terra Cotta Building Products

Presented By:




University of Colorado — Boulder, Colorado.

LEARNING OBJECTIVES

1. Examine how architectural terra cotta tile products are manufactured and why they are considered a highly sustainable building product.
2. Dispel four common misconceptions about terra cotta building products.
3. Understand key performance benefits of architectural terra cotta clay tile products.
4. Explore design opportunities and applications for terra cotta roof tiles, including a case study where the product was used.
5. Explore design options and applications for terra cotta wall cladding, including a case study where this system was used.

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HISTORY OF ARCHITECTURAL TERRA COTTA

For thousands of years, cities of old-world Europe, Asia, and beyond have used terra cotta's proven technology and performance as pillars of architecture and design. Terra cotta has been used for millennia in ancient structures such as the Roman Colosseum (1st century), the Trier Basilica in Germany (12th century), and China's Forbidden City and Great Wall (15th century). These structures demonstrate terra cotta's tremendous life expectancy, which cannot be matched by synthetic materials such as concrete.

Architects can use architectural terra cotta products for roofs and walls in residential, multifamily residential, and commercial projects such as banks, hotels, and retail facilities. In addition, they are widely used in government buildings, and in fact, from the early to mid-1900s, the US government was the largest purchaser of terra cotta roof tiles in North America. This was because terra cotta was installed on all courthouses, military bases, federal buildings, and structures on the Panama Canal. Terra cotta is also often used for religious buildings and in historic restoration projects.

Frank Lloyd Wright specified terra cotta products on many of his designs over the years, and numerous iconic historic buildings in the United States prominently feature the material. The Boston Public Library, Ellis Island, Rockefeller Center, Empire State Building, Federal Reserve, and White House Promenade are among the long list of public and private buildings that have taken advantage of the longevity and beauty of terracotta materials. Today's terra cotta incorporates old-world craftsmanship with modern production technologies to create terra cotta products that stand the test of time.



Pennsylvania State Capitol — Harrisburg, Pennsylvania.

TERRA COTTA MANUFACTURING

Harvesting

The raw material for terra cotta is natural and abundant clay. Clay consists of water, aluminum, silica, carbonaceous material, magnesium, and other natural elements. There are two kinds of clay used for terra cotta, shale and fire, which are harvested from a clay mine in southeast Ohio and brought to the plant for further processing.

Grinding, Shaping, and Drying

The clays are blended, ground, and screened for impurities. Then, depending on whether terra cotta roof tiles or wall panels are being manufactured, the clay is either pressed into handmade plaster molds or is passed through an extrusion mill, where the clay form is extruded under pressure. The terra cotta may then undergo further shaping, and color



Hopelands — Middletown, Rhode Island.

or texture treatments are added. Terra cotta products must be bone dry before they are fired, so moisture is removed in a dryer oven that uses recycled heat from the tunnel kiln.

Glazing and Firing

Clay red is the natural base color for all terra cotta products. From here, a ceramic glaze composed of mineral frits is applied to each tile to achieve the desired color. Color glazes are kiln-fired at extreme temperatures during production, allowing the original tones and hues to hold through the life of the tile. High temperatures must be maintained for a sustained period, so the clay becomes “vitrified,” or stoneware. Clay fired at temperatures higher than 2,100°F for more than 24 hours is virtually impervious to fire, rot, and pollution.

Historic color matching and custom color development play a big part in many projects. Ceramic engineers start with a basic formula for fired colors (glazes) which are then analyzed, adjusted, and mixed until the desired formula is achieved.

MANUFACTURING —

A SUSTAINABLE PROCESS

Recyclability

Terra cotta is free of toxic and synthetic ingredients because it is made entirely from natural materials (fire clay, shale, water, and fire) and its manufacturing creates zero waste.

GLOSSARY

Carbon dioxide (CO₂): The primary greenhouse gas emitted from human activity

Color range: The naturally occurring variation of tones present on every clay tile product

Cool Roof Rating Council: An independent, non-biased organization that develops methods for evaluating and labeling roofing products’ surface radiative properties

Cradle to Cradle: A globally recognized measure of safer, more sustainable products made for the circular economy

Energy Star: A program run by the U.S. Environmental Protection Agency and U.S. Department of Energy that promotes energy efficiency

Glaze: A vitreous substance fused onto the surface of pottery to form an impervious decorative coating

Rainscreen: A system consisting of an outer panel, a ventilated cavity, and an inner skin that is back-ventilated and drained

Solar Reflective Index (SRI): A measure of the solar reflectance and emissivity of materials that can be used to indicate how hot they are likely to get due to solar radiation on their surface; the higher the SRI, the better the material will be at reflecting solar radiation

Terra cotta: A fairly coarse, porous clay that when fired assumes a color ranging from dull ochre to red and can be left unglazed or glazed

Tunnel kiln: A continuous moving ware kiln in which the clay products to be fired are passed on cars through a long horizontal tunnel; the firing of products occurs at the central part of the tunnel

In fact, terra cotta tiles are 100% recyclable because rejected or broken clay can be crushed and reused, and 95% of production waste, such as clay, water, and glaze, is recycled. At the end of their life, clay tiles are crushed for use as drainage fill or landscaping through the existing brick recycling stream.

Emissions

Regarding carbon dioxide (CO₂) emissions, terra cotta requires a lower cost of energy per ton to produce, resulting in lower CO₂ emissions than other raw materials. In addition, modern tunnel kilns are very energy efficient, and excess heat from kilns can be recycled to heat the factory and dryers during the winter months. The “In the Scale of Carbon” infographic created by the Materials Council shows visual

representations of materials according to the amount of carbon dioxide produced during their manufacture. "Each square illustrates the volume of material that can be produced for one tonne of CO₂ emissions, relative to other materials commonly used for architectural constructions. The infographic highlights the high impact of manufacturing metals like steel, and aluminum, while illuminating less impactful raw materials such as clay, sandstone, and wood. Clay and softwood come out on top in the "green" stakes, as it's possible to produce 9.8 cubic meters of those materials per one tonne of CO₂, while just 0.02 cubic meters of stainless steel can be made for the equivalent emissions."

Life Expectancy

Terra cotta products have unmatched durability, with a life expectancy of over 100 years, far exceeding the life expectancy of other roofing and wall cladding materials. Because terra cotta products do not require maintenance, the environment is spared from the runoff of harsh chemical cleaners and landfills filling up with roofing products that need to be replaced every ten years. This also equates to the lowest life cycle costs in the industry.

CERTIFICATIONS

Four organizations set the standards for sustainability of roofing materials: Cool Roof Rating Council, Energy Star, Cradle to Cradle, and LEED. Terra cotta products can earn some or all of these certifications.

CRRC

The Cool Roof Rating Council (CRRC) is an independent, non-biased organization that develops methods for evaluating and labeling roofing products' surface radiative properties (solar reflectance and thermal emittance). To qualify as a cool roof under the Energy Code, the roofing material must have a CRRC rating for reflectance and thermal emittance and meet the aged reflectance and thermal emittance – or Solar Reflective Index (SRI) – values specified in the Energy Code. The higher the SRI, the better the roofing material's ability to reduce heat transfer into a building. 20+ terra cotta colors are rated with the Cool Roof rating program, with several



St. Simons Island, Georgia.

colors that have a Solar Reflective Index greater than 39.

Energy Star

An Energy Star labeled product is a reflective roof product that lowers roof surface temperature, decreasing the amount of heat transferred into a building's interior. Additionally, terra cotta sunscreen systems provide an attractive way to direct and diffuse sunlight from building exteriors, creating an effective means to reduce solar heat gain while maintaining daylighting.

Cradle to Cradle

Cradle to Cradle is a globally recognized measure of safer, more sustainable products made for the circular economy. According to Cradle to Cradle, "To receive certification, products are assessed for environmental and social performance across five critical sustainability categories: material health, material reuse, renewable energy and carbon management, water stewardship, and social fairness. A product is assigned an achievement level (Bronze, Silver, Gold, or Platinum) for each category, with the lowest category achievement representing the product's overall certification level." Products that qualify for Cradle to Cradle's

holistic certification program are not only efficient but essentially waste-free. For example, some terra cotta products have a material reutilization content score of more than 30. In addition, the color-permanent material will last 100 years, and it has superior life cycle cost benefits compared to other building products.

LEED

According to the US Green Building Council, "LEED is an internationally recognized certification system that measures how well a building or community performs across all the metrics that matter most: energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts." Terra cotta products can qualify for the following LEED credits (depending on project location, color, and post-industrial recyclable content of product-selected):

- **MR Credit: Building Product Disclosure**
 - Terra cotta products that are Cradle to Cradle certified for material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness may earn this credit.

- **MR Credit: Building Product Disclosure and Optimization - Sourcing of Raw Materials**

- Clay tile has a post-industrial recyclable content of 3%. This can be increased by using a special clay body blend made of clay scrap, shale, and waste material that produces a clay tile with 40% post-industrial content.

- **SS Credit: Heat Island Reduction**

- 1-2 LEED points can be earned for LEED approved colors that meet an initial SRI > 39 or a 3-year aged SRI > 32.

MISCONCEPTIONS ABOUT TERRA COTTA

Misconception #1

Only Spanish and Mission Style Roof Products are Available

There are several common misconceptions about terra cotta building products, the most prominent being that terra cotta products are typically only available as Spanish and Mission-style roof tiles. But in fact, manufacturers offer a wide range of architectural terra cotta products available for roofing, wall cladding, solar shades, and quarry floor tile applications. Many of these products are flat tiles with clean, crisp lines that can be used in numerous architectural designs.

A wide selection of profiles replicate slate and shake textures, providing an excellent alternative to wood shake and natural slate products. In addition, the longevity of the tile and color exceeds 75 years, far longer than these traditional products. One manufacturer offers 40+ standard roof tile profiles and hundreds of accessory pieces and custom options to trim and finish a project. These specialty items will help solidify the architectural style of the building, whether it's traditional or contemporary.

QUIZ

1. Clay fired at temperatures higher than _____ degrees Fahrenheit for more than 24 hours is virtually impervious to fire, rot, and pollution.

a. 1,100	b. 1,500
c. 2,100	d. 2,500
2. Terra cotta tiles are _____ percent recyclable because rejected or broken clay can be crushed and reused, and _____ percent of production waste, such as clay, water, and glaze, is recycled.

a. 95, 100	b. 95, 85
c. 100, 90	d. 100, 95
3. Terra cotta products have unmatched durability, with a life expectancy of over _____ years, far exceeding the life expectancy of other roofing materials.

a. 50	b. 75
c. 100	d. 125
4. The longevity of the tile and color exceeds _____ years — far longer than traditional products — enhancing the building's aesthetics.

a. 75	b. 150
c. 250	d. 100
5. Terra cotta products can qualify for which of the following LEED credits?

a. MR Credit: Building Product Disclosure
b. MR Credit: Building Product Disclosure and Optimization - Sourcing of Raw Materials
c. SS Credit: Heat Island Reduction
d. All of the above
6. For steep slope, hard roofing products, _____ lbs/SF is considered lightweight and will often have little to no effect on the building's structural framing design.

a. 2	b. 4
c. 6	d. 8
7. Superior tiles can resist loads of more than _____ pounds before breaking.

a. 200	b. 500
c. 1,000	d. 1,200
8. When properly installed, high-quality terra cotta roof tiles and wall claddings can sustain winds in excess of _____ miles per hour, which would easily damage other construction materials.

a. 75	b. 100
c. 115	d. 125
9. When terra cotta roof tiles and wall panels are kiln-fired at high temperatures for a long period of time, the clay vitrifies into a dense glass-like material with a water absorption rate of less than _____ percent for roof tiles and less than _____ percent for wall cladding panels.

a. 2, 6	b. 1, 6
c. 2, 5	d. 3, 15
10. Which type of terra cotta wall cladding is small format and emphasizes shadow lines on a façade?

a. Large format panels	b. Shingle style
c. Flush style	d. Baguette

SPONSOR INFORMATION



Since 1888, architects, homeowners, universities, commercial and government clients have turned to Ludowici for uniquely beautiful architectural terra cotta products that stand the test of time. Ludowici clay tiles are the highest quality available, are infinitely customizable, and carry a 75-year material warranty.



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Designing to the Edges: Exploring Community- Led Architecture

Presented By:



Tools such as community-led design can help develop trust between partners, deepen historical and cultural understanding, and elevate community voices.

DESIGNING TO THE EDGES

A common misconception is that most people are average at most things (e.g., language, math skills, creativity, or emotional intelligence). Reality tells us that there is a very wide spread in the abilities of citizens worldwide, which can be affected by their mental and physical health, education level, cognitive abilities, and economic situation, among many other factors. The concept of “designing to the edges” can be used in many disciplines, from education to product design to architecture, but in general, it is used to create designs that are useful to a wide range of people, as opposed to

being designed for an average person. It is a design that considers the “full range of human characteristics, traits, abilities, and interests.” For each human factor, a design should consider the edges, including those on the edges of society, from minorities to the disabled to homeless and low-income citizens.

IDENTIFYING VULNERABLE AND UNDERSERVED POPULATIONS

The Department of Health and Human Services (HHS) characterizes underserved, vulnerable, and special needs populations as communities that include minorities or individuals who have

LEARNING OBJECTIVES

1. Identify and characterize underserved, vulnerable, and special needs populations.
2. Examine the challenges that various underserved populations face in our built environment and how community-led architecture can lift these populations and alleviate some of their burdens.
3. Describe how propane is used globally for cooking, water- and space-heating to provide an affordable, energy-efficient option for vulnerable communities.
4. Explore several case studies where community-led architecture improved the quality of life of underserved populations.

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experienced health disparities, including:

- Latino populations
- African American populations
- AI/AN populations (American Indian/Alaskan Native)
- Refugees
- Migrant farmworkers
- Individuals with limited English proficiency (LEP)
- Homeless
- Low-income
- Individuals with disabilities ranging from physical to intellectual, psychiatric, and neurological



Vulnerable and underserved populations have several identifiable characteristics and barriers, which are essential to know when designing buildings and spaces to accommodate these groups.

In addition, society has become increasingly aware of the neurodiversity of people, which Harvard Health Publishing describes as, “The idea that people experience and interact with the world around them in many different ways; there is no one ‘right’ way of thinking, learning, and behaving, and differences are not viewed as deficits.” Of course, everyone is neurodiverse, but the term often applies to those with autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), learning disabilities, and other neurological or developmental conditions. Harvard Health Publishing continues, “Stigma, a lack of awareness, and lack of appropriate infrastructure can cause exclusion of people with neurodevelopmental differences. Understanding and embracing neurodiversity

in communities, schools, healthcare settings, and workplaces can improve inclusivity for all people. It is important for all of us to foster an environment that is conducive to neurodiversity, and to recognize and emphasize each person’s individual strengths and talents while also providing support for their differences and needs.”

CHARACTERISTICS OF VULNERABLE AND UNDERSERVED POPULATIONS

Vulnerable and underserved populations have several identifiable characteristics and barriers, which are essential to know when designing buildings and spaces to accommodate these groups. They often have a high risk for multiple health problems and/or pre-existing conditions and have limited life options such as financial, educational, and housing choices. Underserved populations tend to display fear and distrust in accessing government programs or disclosing sensitive information about family members and have a limited ability to understand or give informed consent without the assistance of language services. Vulnerable populations also often have mobility impairments, lack of access to transportation services, and a lowered capacity to communicate effectively, all of which can lead them to face different types of discrimination when going about their daily lives.



Public officials, urban planners, transportation decision-makers, architects, landscape architects, builders, and real estate developers can all play a role in addressing public health challenges via the built environment.

GLOSSARY

- BIPOC:** Black, Indigenous, and People of Color
- Community-led design:** A design tool that can help develop trust between partners, deepen historical and cultural understanding, and elevate community voices by engaging local residents, government, and community partners
- Designing to the edges:** A concept that is used to create designs that consider the full range of human characteristics, traits, abilities, and interests so as to create designs that are useful to a wide range of people, as opposed to being designed for an average person
- Neurodiversity:** The idea that people experience and interact with the world around them in many different ways; there is no one ‘right’ way of thinking, learning, and behaving, and differences are not viewed as deficits
- Propane:** A nontoxic gas byproduct of natural gas processing and oil refining that is used much like natural gas, providing fuel for space heating, water heating, cooking, fireplaces, power generation, and clothes drying
- Title VI of the Federal Civil Rights Act of 1964:** Prohibits discrimination on the basis of race, color, or national origin in any program or activity that receives federal funds or other federal financial assistance
- Underserved population:** Vulnerable communities that include minorities or individuals who have experienced health disparities
- United Nations Sustainable Development Goals:** 17 interlinked global goals designed to be a blueprint to achieve a better and more sustainable future for all
- Urban Land Institute (ULI):** A nonprofit research and education organization whose mission is to shape the future of the built environment for transformative impact in communities worldwide

As you can see from this list of underserved, vulnerable, and special needs populations, many different groups of people live on society’s edges. In addition, there is a wide range of disabilities and neurodiversities to consider when designing more equitable and inclusive architecture. When thoughtfully and carefully designed, it can lift citizens and entire communities from their burdens, whether physical, mental, or economic. Indeed, community-led architecture can help create more sustainable, healthier, and happier communities.

THE INTERSECTION OF HEALTH AND THE BUILT ENVIRONMENT

There is an essential link between human health and the development of our built environment. Global communities face many pressing health challenges related to the built environment, which has expanded the role of public health beyond healthcare professionals and facilities. For example, planning inequities, including denying basic amenities such as sewer and water services, can help to create significant public health risks for residents and nearby populations and is a form of environmental injustice. Likewise, energy inequity is a significant issue when cleaner energy sources are only available to those who can afford them and, as is often the case, investments in clean energy are funded by making energy more expensive for low-income populations. Other examples of planning inequities include communities overburdened by unhealthy land uses, lack of public transportation, affordable housing, and services, and inadequate accessibility for those with disabilities.

In fact, “environmental racism” is a term used to describe communities of color living in the shadows of landfills, mills, sewage plants, incinerators, and other toxic industrial facilities. Title VI of the federal Civil Rights Act of 1964 “prohibits discrimination on the basis of race, color, or national origin in any program or activity that receives federal funds or other federal financial assistance.” This law is supposed to ensure that agencies that receive federal funding, such as the Environmental Protection Agency (EPA), do not act in a discriminatory manner. An example of conduct that might violate Title VI is providing a predominantly minority community with lower benefits, fewer services, or subjecting them to harsher rules than a predominantly non-minority community. While this provision presents a powerful legal tool for combating environmental injustice, and there is a process for such communities to make environmental discrimination complaints to the EPA’s Civil Rights Office, most communities’ appeals for help are rejected. According to The Center for Public Integrity, “More than nine of every ten times communities have turned to it for help, the Civil Rights Office has either rejected

or dismissed their Title VI complaints. In the majority, the office rejected claims without pursuing investigations. On the few occasions that it did, it dismissed cases more often than it proposed sanctions or remedies.”

The built environment is part of the health problem but can also be part of the solution, as health is a core component of thriving communities. Health can include eliminating people’s stressors and improving their physical, mental, and emotional wellbeing. To truly advance wellness across sectors and communities, stakeholders need to collectively consider the trifecta impact of economics, governance, and health. Public officials, urban planners, transportation decision-makers, architects, landscape architects, builders, and real estate developers can all play a role in addressing these public health challenges via the built environment.

The Role of Design Professionals

These challenges push planners and designers to protect at-risk communities better, create equitable access, address service gaps, and promote wellbeing, health, and sustainability. Designers can provide active transportation, proximity to nature and transit, and greener and healthier buildings. They can contribute to clean air and water by designing with cleaner energy sources. By thoughtfully designing affordable, accessible, and inclusive facilities while providing access to healthy food, the building industry as a whole can do its part to lift citizens, and entire communities, from their burdens.

Design teams may face hurdles in building trust and creating productive working relationships across actual and perceived divides between community residents, local government, and community partners. But there are tools, such as community-led design, that can help develop trust between partners, deepen historical and cultural understanding, and elevate community voices. In the end, the result will be richer, more robust, and more meaningful design outcomes. And fortunately, there are global networks that can leverage their members to shape places and projects that improve the health of people and communities.



Tools such as community-led design can help develop trust between partners, deepen historical and cultural understanding, and elevate community voices, resulting in richer, more robust, and more meaningful design outcomes.

Urban Land Institute Building Healthy Places Initiative

One prominent organization, the Urban Land Institute (ULI), believes that “healthy places are designed, built, and programmed to support the physical, mental, and social wellbeing of the people who live, work, learn, and visit there.” ULI’s Building Healthy Places Initiative hopes to leverage the power of its global networks of real estate leaders to “shape projects and places in ways that improve the health of people and communities.” They are accomplishing this by raising awareness of the connections between health and the built environment among the real estate community and developing or sharing tools that define approaches to healthy buildings, projects, and communities. As a result, ULI has created meaningful value propositions and gained commitments from its members and others, including local governments, to work, build, and operate in more health-promoting ways.

This is just one example of one organization leading the charge toward a healthier built environment for all, not just the privileged. As stewards of the built environment, designers, landscape architects, real estate professionals, and municipalities are charged with the vitally important task of supporting healthy living through design. Healthy places should be designed thoughtfully, with an eye toward making the healthy choice the easy choice, and should be built using health-promoting materials using innovative and sustainable solutions.

- **MR Credit: Building Product Disclosure and Optimization - Sourcing of Raw Materials**

- Clay tile has a post-industrial recyclable content of 3%. This can be increased by using a special clay body blend made of clay scrap, shale, and waste material that produces a clay tile with 40% post-industrial content.

- **SS Credit: Heat Island Reduction**

- 1-2 LEED points can be earned for LEED approved colors that meet an initial SRI > 39 or a 3-year aged SRI > 32.

MISCONCEPTIONS ABOUT TERRA COTTA

Misconception #1

Only Spanish and Mission Style Roof Products are Available

There are several common misconceptions about terra cotta building products, the most prominent being that terra cotta products are typically only available as Spanish and Mission-style roof tiles. But in fact, manufacturers offer a wide range of architectural terra cotta products available for roofing, wall cladding, solar shades, and quarry floor tile applications. Many of these products are flat tiles with clean, crisp lines that can be used in numerous architectural designs.

A wide selection of profiles replicate slate and shake textures, providing an excellent alternative to wood shake and natural slate products. In addition, the longevity of the tile and color exceeds 75 years, far longer than these traditional products. One manufacturer offers 40+ standard roof tile profiles and hundreds of accessory pieces and custom options to trim and finish a project. These specialty items will help solidify the architectural style of the building, whether it's traditional or contemporary.

QUIZ

1. Clay fired at temperatures higher than _____ degrees Fahrenheit for more than 24 hours is virtually impervious to fire, rot, and pollution.

a. 1,100	b. 1,500
c. 2,100	d. 2,500
2. Terra cotta tiles are _____ percent recyclable because rejected or broken clay can be crushed and reused, and _____ percent of production waste, such as clay, water, and glaze, is recycled.

a. 95, 100	b. 95, 85
c. 100, 90	d. 100, 95
3. Terra cotta products have unmatched durability, with a life expectancy of over _____ years, far exceeding the life expectancy of other roofing materials.

a. 50	b. 75
c. 100	d. 125
4. The longevity of the tile and color exceeds _____ years — far longer than traditional products — enhancing the building's aesthetics.

a. 75	b. 150
c. 250	d. 100
5. Terra cotta products can qualify for which of the following LEED credits?

a. MR Credit: Building Product Disclosure
b. MR Credit: Building Product Disclosure and Optimization - Sourcing of Raw Materials
c. SS Credit: Heat Island Reduction
d. All of the above
6. For steep slope, hard roofing products, _____ lbs/SF is considered lightweight and will often have little to no effect on the building's structural framing design.

a. 2	b. 4
c. 6	d. 8
7. Superior tiles can resist loads of more than _____ pounds before breaking.

a. 200	b. 500
c. 1,000	d. 1,200
8. When properly installed, high-quality terra cotta roof tiles and wall claddings can sustain winds in excess of _____ miles per hour, which would easily damage other construction materials.

a. 75	b. 100
c. 115	d. 125
9. When terra cotta roof tiles and wall panels are kiln-fired at high temperatures for a long period of time, the clay vitrifies into a dense glass-like material with a water absorption rate of less than _____ percent for roof tiles and less than _____ percent for wall cladding panels.

a. 2, 6	b. 1, 6
c. 2, 5	d. 3, 15
10. Which type of terra cotta wall cladding is small format and emphasizes shadow lines on a façade?

a. Large format panels	b. Shingle style
c. Flush style	d. Baguette

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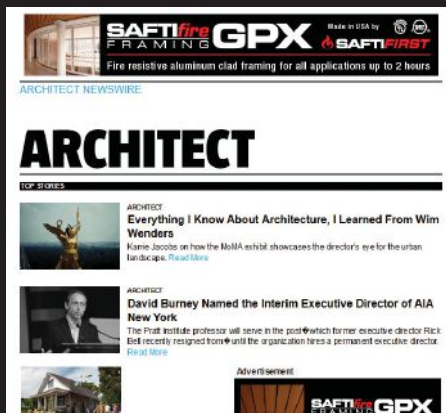
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Editorial: Rethinking Architectural History

TEXT BY PAUL MAKOVSKY

When I was a student of architectural history, the survey books I read were entrenched in the Western foundations of the architectural canon: Be it Nicholas Pevsner's *Pioneers of Modern Design: From William Morris to Walter Gropius* (1936), or Kenneth Frampton's *Modern Architecture: A Critical History* (Thames & Hudson, 1980), these histories—continuously being revised—explored Modernism with its roots planted in Europe, and the main figures being Le Corbusier, Frank Lloyd Wright, and Ludwig Mies van der Rohe, just to name a few. And while these books communicate a grand narrative, it's refreshing to see a new generation of architectural historians opening up that canon and challenging, reconsidering, and expanding how we think about architecture and its history.

Take Architectural historian Barnabas Calder's book *Architecture: From Prehistory to Climate Emergency* (Pelican, 2021), which tells the history of architecture as one of energy use, and how it traditionally was shaped by available energy, maximizing or minimizing its requirements in as natural a way as possible. He points out that architecture has a colossal role to play in the climate crisis; after all, construction and running buildings accounts for almost 40% of human greenhouse gas emissions. He takes us on a world tour of iconic buildings of the past 15,000 years, in locations from Ancient Rome to China's booming megacities; throughout he reveals how every building—from the Parthenon to a typical Georgian house—was influenced by the energy available to its architects, and why this matters. If we are going to reduce our consumption, then the old ways need to be explored again. He argues that we need to create beautiful but also intelligent architecture, and to retrofit—not demolish—the buildings we already have.

Charles L. Davis II, the associate professor of architectural history and criticism at the University at Buffalo School of Architecture and Planning, is another architectural historian disrupting the field of architectural history. As a designer, architectural

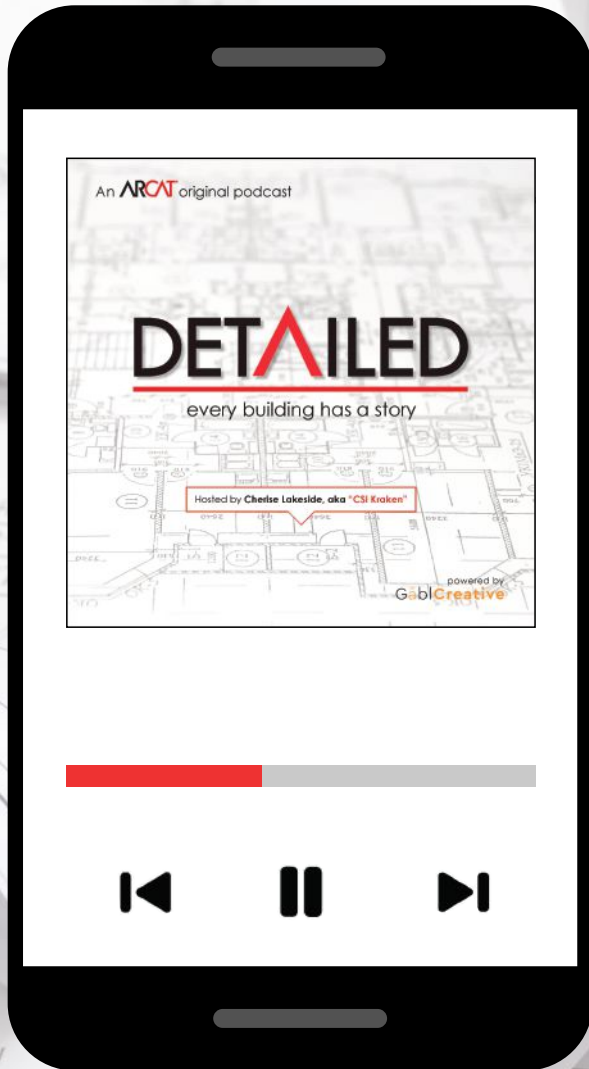


A 1941 photo of congregants at Chicago's Pilgrim Baptist Church, formerly a synagogue designed by Louis Sullivan, from the book *Building Character*. Author Charles L. Davis II describes how new congregations reused existing religious structures. "Demographic changes and white flight made African Americans the final stewards of Kehilath Anshe Ma'ariv Synagogue beginning in 1921. It was only through these historical migrations that blacks were finally given a chance to contribute to the democratic aims of Sullivan's political discourse," Davis writes.

historian, and cultural critic, his research focuses on racial identity and race thinking related to architectural history and contemporary culture. In his book, *Building Character: The Racial Politics of Modern Architectural Style* (University of Pittsburgh Press, 2019), he provides a revisionist history that recovers the ways that architectural organicism provided a rationalist model of design to consciously relate the perceived racial and architectural "characters" of a nation to the people they served. By examining the ethnographic histories of figures important to architecture including Wright, Eugène Emmanuel Viollet-le-Duc, Gottfried Semper, and William Lescaze, Davis revises the Western canon to account for the role of racial ideas.

In his essay "Black Spaces Matter" for the Aggregate architectural history website, Davis reconsiders the writings of the poet June Jordan, who in 1965 collaborated with Buckminster Fuller on an architectural redesign of Harlem. He argues that her work operates on the same level as utopian architectural schemes and that contributions by non-white producers like Jordan are often overlooked. Davis' current book project, tentatively entitled *Black By Design: An Interdisciplinary History of Making in Modern America*, recovers the overlooked contributions of Black artists and architects in shaping the built environment from the Harlem Renaissance to Black Lives Matter. As a work that advocates for missing voices within the canon, it is one I look forward to reading when it comes out.

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