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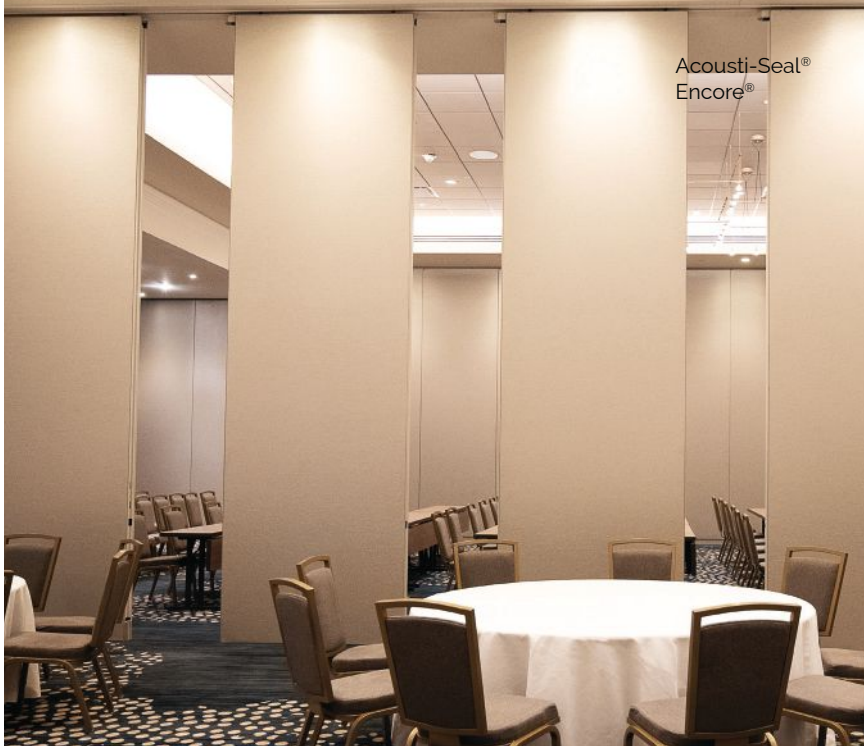
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Contents

Volume 110, number 1. January/February 2021.
On the cover: American Dream, designed by Adamson Architects, Gensler, and GH+A; photo by Sahar Coston-Hardy.
Below: Corbett Preparatory School of IDS, in Tampa, Fla., designed by Education Design International; photo courtesy Education Design International.

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MISCONCEPTIONS ABOUT FIRE-PROTECTIVE VS. FIRE-RESISTIVE GLASS

Fire-resistive glass redefines possibilities for optimizing natural daylight.

If there's a common language in modern architecture, it's the vocabulary of natural daylight. Opening interiors to introduce more daylight is becoming a design imperative, and once-dark corners of the built environment, such as stairwells, elevator enclosures, and parking garages, are now illuminated with welcoming natural daylight.

Few dispute the need: The world's largest independent assessor of workplace effectiveness, Leesman, surveyed a quarter-million employees in 69 countries on the value of daylight. Nearly 76% of the respondents highly valued daylight in the workplace. However, just under 57% are satisfied with existing access to it in their workplace.

If daylit spaces are the goal, fire-rated glass is the delivery vehicle. The challenge is, Chapter 7 of the International Building Code presents a thicket of specification detail. Manufacturers' claims—such as relying on fire endurance ratings (20, 45, 60, 90, 120 and 180 minutes) or labeling a glazing product with terms like "thick" or "thin"—can also cloud the process.

Four common misconceptions:

1. **Fire-protective glass is the same as fire-resistive glass.** The life-safety differences between the two are vast: Fire-protective glass prevents the passage of the visible elements of a fire—flame and smoke—but it does virtually nothing to shield building users from potentially lethal radiant heat. Only fire-resistive glass prevents the passage of radiant heat that can result in spontaneous combustion and inflict severe injury and death. Fire-resistive glass is a passive, or built-in, life-safety barrier that can be counted on when active fire suppression systems such as sprinklers have failed.
2. **Ceramic glass is the only wire-free fire-protective glass option.** There was a time when ceramic glass was widely touted as the wire-free alternative to traditional wired-glass for flame and smoke separation. Last year, a patented, U.S.-made, wire-free, low-iron, 45-minute fire-protective glass product called SuperClear 45-HS-LI was introduced to the market. SuperClear 45-HS-LI meets all fire, hose stream, and safety requirements without any films or laminates at approximately half the cost of ceramic glass. Ceramics also have an amber tint, and have to be filmed or laminated to meet safety requirements, adding to their already high cost.
3. **Fire-resistive glass limits design choice.** There's never been a better time to open interior design to unprecedented levels of natural daylight. Fire-resistive glass blocks fire, smoke, and radiant heat without films, laminates, wires, or tints. Low-iron, fire-resistive glass options from SAFTI FIRST—a vertically integrated, single-source, U.S.-based manufacturer of advanced fire-rated glass and framing systems—achieve the same clarity as non-rated glazing, and can help shape a uniform design aesthetic.
4. **Only gypsum, brick, and other opaque materials meet ASTM 119/UL 263 for a fire-rated wall assembly.** Not any more. Fire-resistive glass is, by IBC definition, a code-compliant transparent wall system. The code-compliance breakthrough of products like SuperLite II-XL, SuperLite II-XLB and SuperLite II-XLM by SAFTI FIRST, opens the door to an unprecedented range of interior and exterior applications.

As you weigh your design options, keep in mind the difference between fire-protective and fire-resistive glass. It's time to use a new vocabulary to advance bringing natural daylight into the built environment.

To learn more about fire protective and fire resistive glass, visit **safti.com/videos**.

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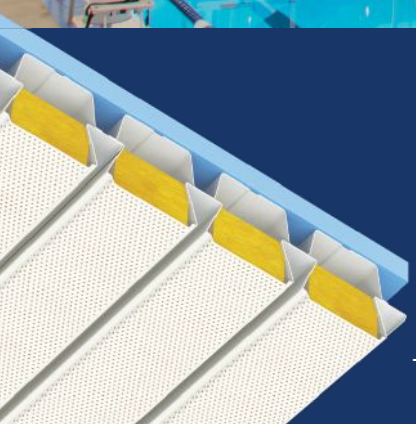

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THE SUN KISSED LESSONS OF CASA KIMBALL

This five-star resort demonstrates how island limitations are no barrier to great design.

Photo credit: Paul Warchol

Casa Kimball is a showcase of addition by subtraction.

The 20,000 square foot private beach house and eight-suite rental villa demonstrates what's possible with material limitations. Or better put, it shows how to take maximum advantage of what is available to construct a luxury Caribbean resort that some experts rank among the world's finest.

Situated on an unspoiled point of land on the northern coast of the Dominican Republic, the project tested a design team led by Jasmit Singh Rangr, principal of Rangr Studio, an award-winning Berkeley, Calif.-based architectural design firm.

DISCOVERY PHASE

Rangr recalls his early days on the project. "I didn't put pen to paper for at least three site visits. We spent those early visits walking the site and assessing material availability and local construction talent. What was the microclimate like? The prevailing winds? The topography? We gathered and mentally filed away all these variables. At design time you can confidently proceed because you know exactly what assets you have to work with."

The coastal beauty of the site also posed a challenge. The project would be the first construction of any kind on the property, which offers a commanding 180-degree view of the ocean. "The constant silent refrain was, 'Don't mess this site up,'" Rangr says.

NO STEEL. NO WOOD. NO PROBLEM.

The remote island location also presented material and logistical difficulties. Among them: No steel. No wood. Nothing imported on a significant scale, which might make it vulnerable to corruption delays and expense, a fact of island life.

One key material was available: ready mix concrete. However, even that wasn't without challenges. "The nearest ready-mix plant was a 90-minute drive away and the nearest high-strength concrete facility even further than that," Rangr says.

WELCOME LIMITATIONS

Rangr was unfazed. "Limitations are really helpful. Constraints are great. We knew right away we were going to build with concrete. I believe the biggest piece of readily available lumber were 2x8s. You're not going to create expansive ocean-facing spans with that. I knew with the type of concrete available we could form spans of eight meters and extend cantilevers three meters, using plywood forms and bamboo scaffolding," he says.

Photo credit: Paul Warchol

Photo credit: Jasmit Rangr

The other material asset was native compressed coral, which the island is made of. Coral cladding became the primary finishing material of Casa Kimball.

ENVIRONMENTAL RESPECT

Rangr's design incorporates principles of modernism, guided by a philosophy that pays respect to "… the environmental conditions of the site. Environment directs the architectural elements," Rangr observes. "It should heighten the experience of that environment and reduce energy expenditures by minimizing cooling and heating through passive conservation techniques. For example, Casa Kimball is equipped with split-system air conditioning as a competitive measure. The fact is, "… nobody uses the system. I expected that to be the case," Rangr explains.

Rangr says Casa Kimball "… couldn't exist without concrete.

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"You're able to transport it in a liquid state and from any way you want. They don't teach material logistics in architectural school. Erecting steel, for example, may require a crane that's blocked by a stand of trees. With concrete, forming a 40-foot beam on-site isn't a problem. Concrete has many logistical advantages."

Today Casa Kimball attracts A-list celebrities, wedding parties, and corporate leadership meetings. There are many attractions, including a 47-meter-long infinity pool and walkways to the ocean.

"It's easy to lose yourself at Casa Kimball," says Rangr. "The interaction of air and water is magical."

Addition by subtraction? At this sun-blessed location, logistical flexibility and architectural ingenuity means multiplication by subtraction.

To learn more, visit BuildWithStrength.com

Project Name: Casa Kimball

Location: Cabrera, Dominican Republic

Architect: Rangr Studio

Client/Owner: Spencer Kimball

Project Types: Residential/ Hospitality

Project Scope: New Construction

Size: 20,000 sq. feet

Year Completed: 2008

Design Team: Jasmit Singh Rangr, Eivind Karlsen, Elizabeth Beecherl, Josh Weiselberg

Consultants: General Contractor: Roland Roger Widman

Engineers: Sixto Romano, Hector Diaz

Photo credit: Paul Warchol

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The Journal of The American Institute of Architects

AIA Architect

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The Rules: Updates on a Universal BIM Standard

TEXT BY TERRI PETERS

The growth in usage of BIM software has been accompanied by increased interest in OpenBIM, a notion in which universal standards and benchmarks exist, and file formats enable interoperability in any BIM-compatible software. Currently, the country lacks mandated or widely used national BIM standards. Instead, BIM approaches are haphazard, varying by company, public agency, or client requirements.

OpenBIM aims to provide uniform standards—such as Industry Foundation Classes, the BuildingSmart Data Dictionary, and BIM Collaboration Format—to limit the time designers spend ensuring their model meets OpenBIM guidelines. On the other end of the spectrum is Closed BIM, in which project team members and collaborators exchange files in a proprietary format. Studios typically work somewhere between OpenBIM and Closed BIM, meaning that not all project BIM data is shareable in a granular way.

BIM Standard Prospects

The nonprofit BuildingSmart International has been working toward global BIM standards for years. Last November, BSI's U.S. chapter was re-established with the goal to develop and encourage the use of open standards for interoperable digital data on national building and infrastructure projects.

Another organization promoting OpenBIM is the National Institute of Building Sciences BIM Council, which announced in December the next steps for its U.S. National BIM Standard (NBIMS-US). The current edition, Version 3, was last updated in 2015 and "cannot be implemented as a comprehensive standard, but instead is a compilation of content chapters covering various BIM-related categories," says NBIMS-US planning committee chair John Messner. He expects Version 4 to be released by the end of this year.

OpenBIM Benefits

OpenBIM standards can improve the design workflow because the current "lack of [software] interoperability forces some stakeholders to work in tools not ideal for their needs to allow for greater collaboration," says Claudia Cozzitorto, director of design technologies at Toronto-based Diamond Schmitt and a BuildingSmart Canada board member. However, she believes project owners will benefit the most from OpenBIM. "Their BIM data is stored and used in an open file format," she says. "It is future-proofed."

OpenBIM also offers security advantages, Cozzitorto says: "We currently share proprietary format files, which means the receiver can open and edit them easily." Sharing a Revit file can seem less secure than sending an IFC file, an OpenBIM format.

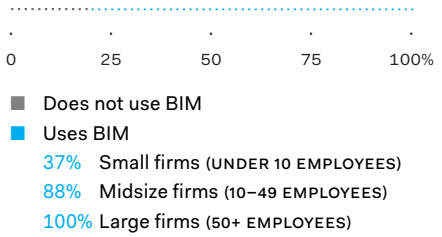
Data Sharing

Sharing project data and drawings among team members has technical challenges to overcome, but the primary obstacle lies at the heart of our industry: Designers are often reluctant to share project information or they don't know when to do so. Is cross-disciplinary collaboration and engagement a universal goal?

Shane Burger, a New York–based principal and the global technology leader at Woods Bagot, believes OpenBIM could be advantageous during the design and delivery process. Yet he remains uncertain whether one standard will prevail industrywide or whether any firm working internationally will need to accommodate multiple standards.

Though University of Illinois at Urbana-Champaign professor Randy Deutsch, FAIA, is an advocate for OpenBIM, he believes the required uniformity of software-agnostic BIM standards may be a concern. "Most designers would prefer to work as they have always worked," he says. "They may feel that following rules—in this case, uniform BIM standards—would slow them down."

BIM Software Usage Among AIA Firm Survey 2020 Respondents



SOURCE: AIA FIRM SURVEY REPORT 2020: BUSINESS OF ARCHITECTURE

> *To read the full version of this story as well as more articles on the latest standards in the building industry, visit bit.ly/ARTheRules.*

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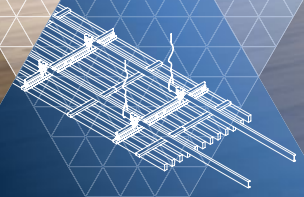

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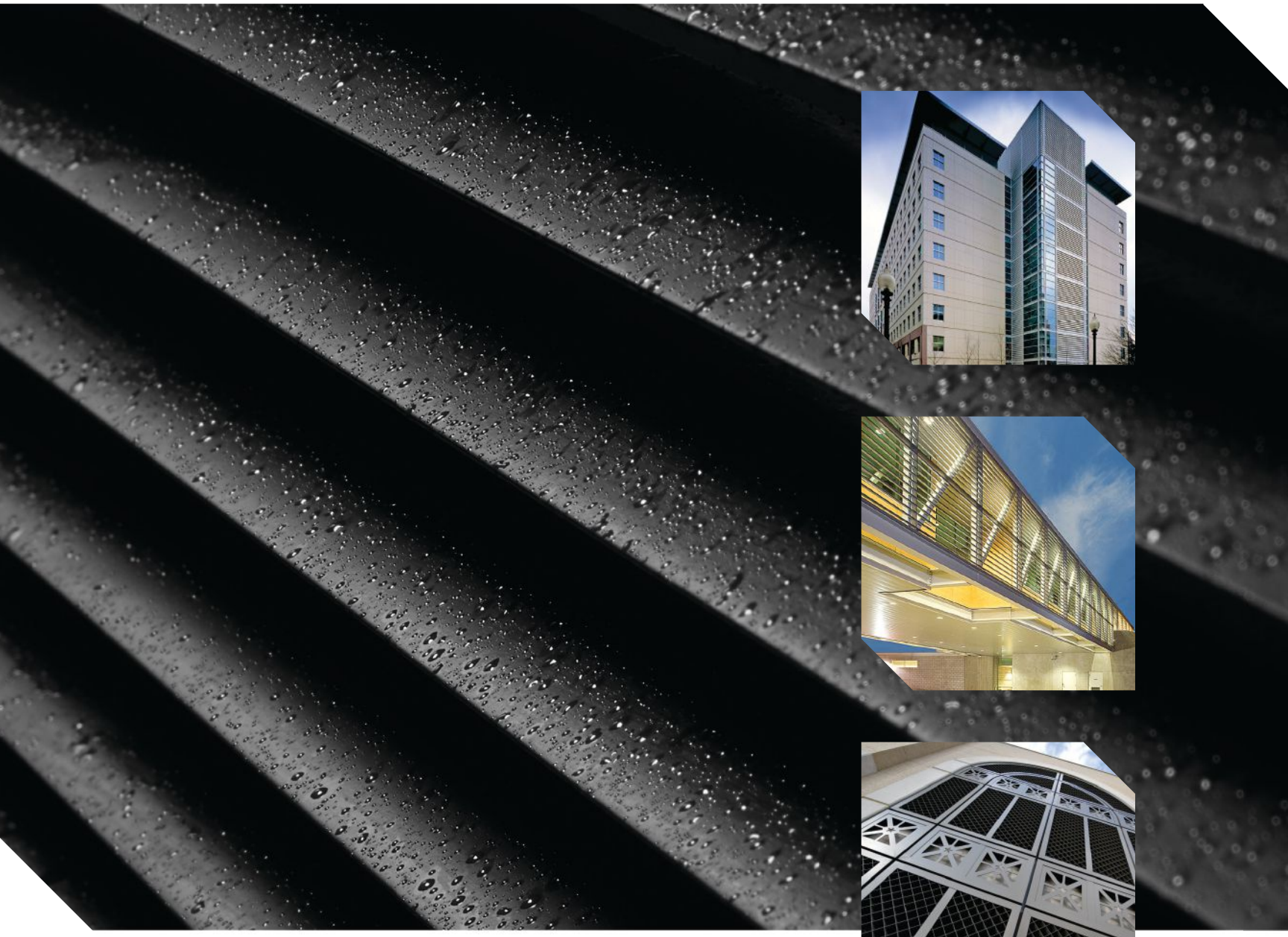

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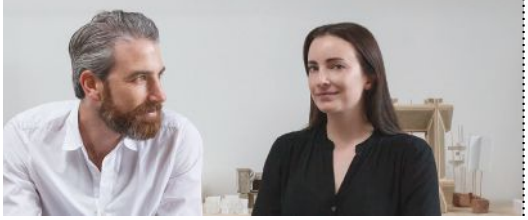
Next Progressives: Peterson Rich Office

EDITED BY ERIC WILLS

Location:
Brooklyn, N.Y.

Year founded:
2012

Firm leadership:
Nathan Rich, AIA, Miriam Peterson, ASSOC. AIA



Firm size:
Seven

Firm's personality:
Passionate and precise, but kind

Education:
Peterson: M.Arch. from the Yale University School of Architecture, B.A. from Cornell University; *Rich:* M.Arch. from Yale, B.A. from Wesleyan University

Experience:
Peterson: Tod Williams Billie Tsien Architects and Gans Studio in New York; *Rich:* Steven Holl Architects and SHoP Architects in New York; Woods Bagot in New York and London

Firm mission:
We create ambitious projects of lasting social and cultural value. We have our aesthetic obsessions, but we also embrace collaboration inside and outside the studio as an essential part of the design process, helping us better serve a diverse range of clients and communities.

First commission:
A painting studio on the Connecticut River. The site was in a flood plain and part of an historic village, so there were significant constraints—a challenging way to start the practice.

Defining project and why:
Galerie Perrotin, a 25,000-square-foot adaptive reuse of a historic building on Manhattan's Lower East Side into a complex for contemporary art. The project spans five floors in the Beckenstein Building and includes offices, a bookstore, residences, art storage, and exhibition spaces. Prior to starting our office, we did primarily institutional work. This project represented a shift back towards more public buildings.

Another important project and why:
We are currently working with an ambitious arts organization in Detroit on the adaptive reuse of a former Catholic church into a multiuse arts complex that will include residential and hospitality programming. The local community is supportive and the potential for long-term impact on the neighborhood is enormous.

Ambitions in the next five years:
To keep building our team. We want an office that reflects the complexity of practice. This would mean hiring thinkers, experts, and creators from outside traditional design disciplines.

Biggest challenge in running a successful practice:
Controlling the ego. Much of architectural education and culture is built around the perspective of the creative individual. Our power as architects is our ability to galvanize creative expertise around common purpose. The better we can get at suppressing the individual ego, the better we will be at steering teams toward excellent ends.

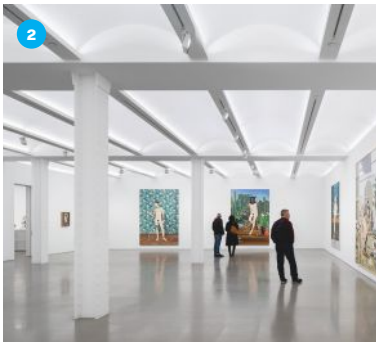
Most urgent policy question facing architects today:
Fixing public housing.

Most urgent political question:
We would make a case for incrementalism. There is a macabre narrative all along the political spectrum today that the institutions of modernity have failed us and that every aspect of life is in a deepening state of crisis. In architecture, this manifests in revolutionary impulses that have roots in architectural history—claims that we should reject our past and our institutions to rebuild the world. Harder to find is a positive vision that sees the world's problems against a background of progress. Architectural practice is slow, and the discipline requires foundational knowledge. Each project is an opportunity for thoughtful and specific action—incremental progress.

DEVON BANKS

> *To read more about Peterson Rich Office, visit bit.ly/PRONextProgressives.*

Next Progressives:
Peterson Rich Office



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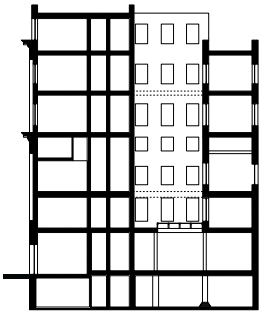

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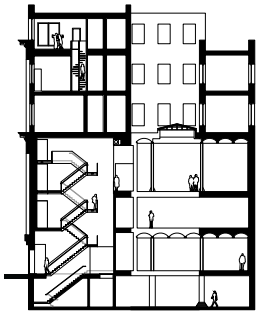
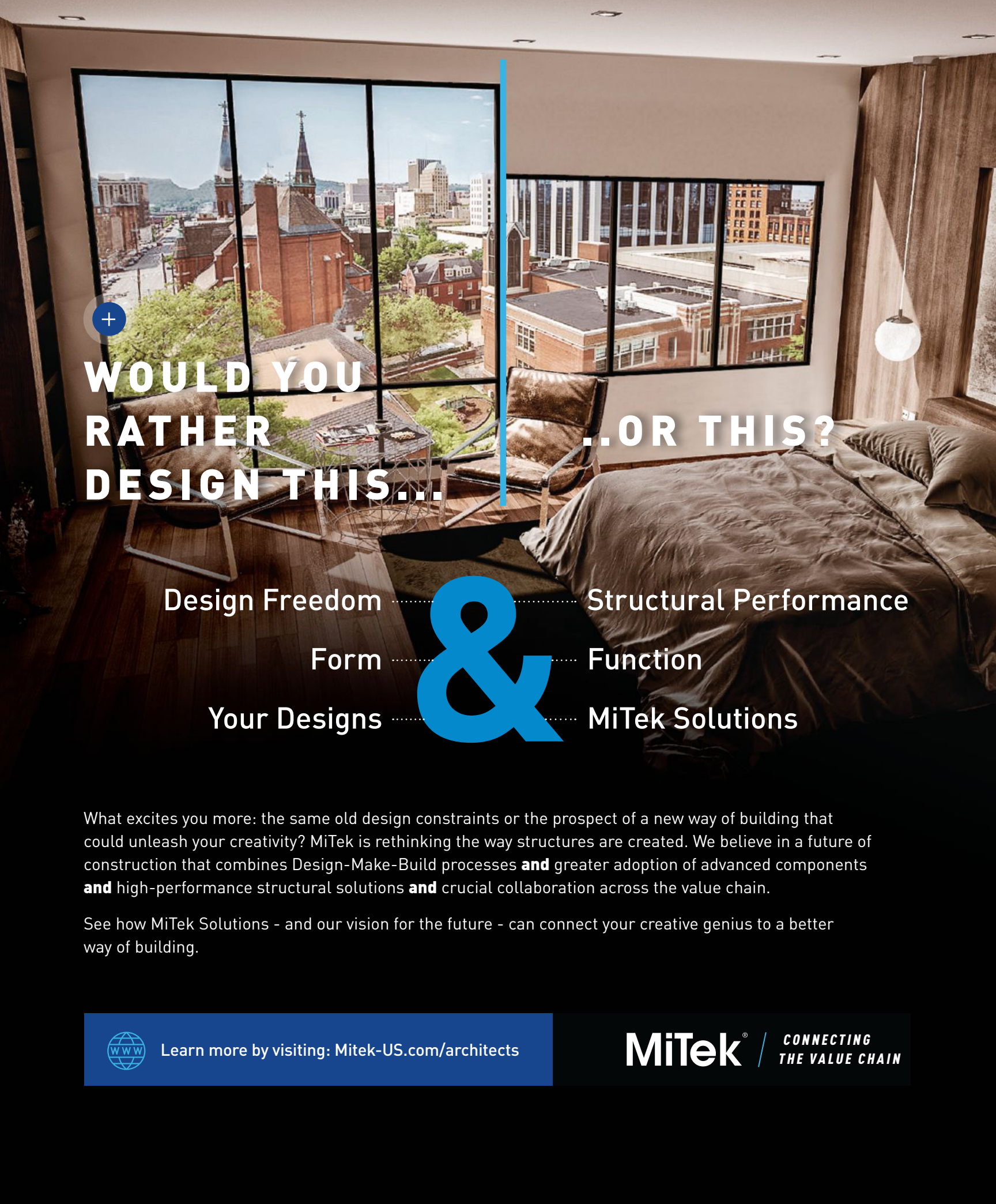


1, 3, 4: COURTESY PETERSON RICH OFFICE; 2: GUILLAUME ZICCARELLI AND RAFAEL GAMO (GALLERY INTERIOR)

1. Inspired by a Tibetan Buddhist mandala, PRO's forthcoming Mandala Lab on the third floor of the Rubin Museum of Art in New York will be dedicated to social and emotional learning that may help visitors better navigate these tumultuous times. **2.** The Galerie Perrotin in Manhattan's Lower East Side, an adaptive reuse of the old Beckenstein building, will expand the concept of the art gallery by combining exhibition space with a bookstore, offices, and residences. **3.** This on-the-boards mixed-use building in Brooklyn, featuring curved brick corners, will offer a mix of units, including a townhouse, studios, floor-length apartments, and a penthouse. **4.** PRO, working with the Regional Plan Association, designed this rendering as part of a larger proposal for ways the cash-strapped New York City Housing Authority can modernize its public housing developments, which are home to more than 400,000 residents. **5.** PRO worked with Gachot Studios to design this new flagship store for Glossier, a skincare and beauty company. Located in the Soho neighborhood of Manhattan, the 5,500-square-foot project emphasizes community.



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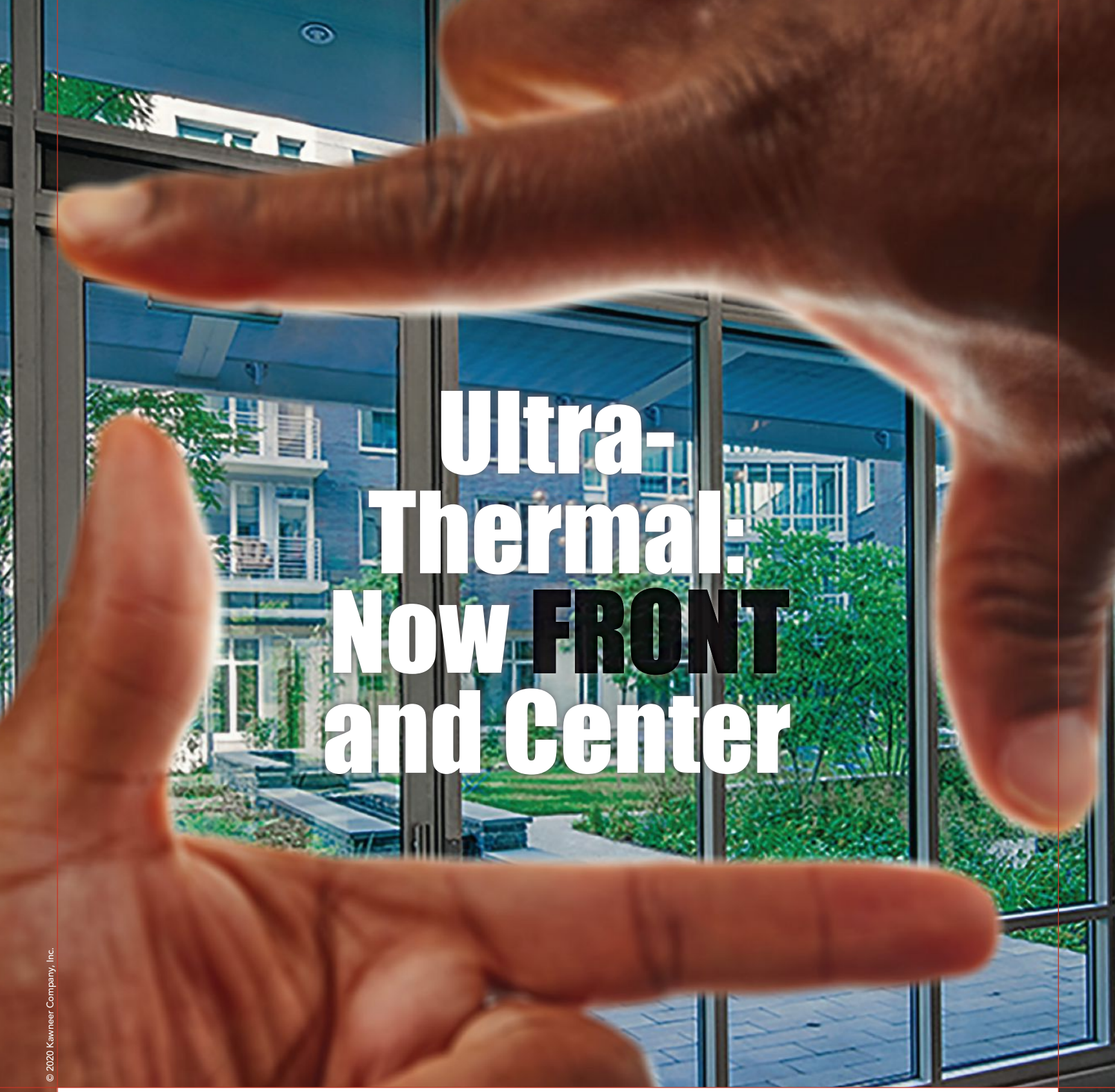

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Opinion: New Hopes for the New Year

TEXT BY JASON PUGH, AIA

Last year was a slap in the face, but with it came invaluable perspective and clarity. We were caught flat-footed by a barrage of haymaker punches: the pandemic, the resultant economic recession, divisive political rhetoric, and the civil unrest following the senseless killings of Ahmaud Arbery, Breonna Taylor, George Floyd, Rayshard Brooks, and countless others. Our lives have been uprooted and our plans derailed. A number of us have lost jobs and, even worse, others have lost their lives or loved ones.

Amid these challenges, the galvanized Black Lives Matter movement has forced the design profession to face the long-standing truths that have systemically perpetuated the dominance of white men in architecture—and the persistently low numbers regarding diversity, equity, and inclusion.

As I step into the role of the new president of the National Organization of Minority Architects, I am reflecting on the challenges we have faced. I am shifting my focus to what makes me hopeful and what message I can share with our membership, local chapters, and allied partners. It is hard to be hopeful while others are in pain, and it is hard to remain positive when no immediate relief is in sight. Nonetheless, a few shimmering rays of daylight have pierced through the clouds, signaling that change is near.

The growing unity among all genders and races across the Black Lives Matter demonstrations last summer has left me hopeful. I've seen more focused and fair coverage on diversity and inclusion in the news and online as well as strong stances on policy changes that will help protect and serve marginalized communities.

NOMA has served as a guiding light in the industry, mediating tough conversations on race, justice, equity, diversity, and inclusion. The increased dialogue on discriminatory practices that have long discouraged the advancement of design professionals of color also makes me hopeful. Many influential global firms are leveraging their power of scale to move the needle toward social justice and equity across the industry, creating a ripple effect. My own firm, Gensler, has created five strategies to fight against racism, support social justice, and combat the long-standing constructs of imbalanced power and discrimination against Black professionals.

As NOMA looks to celebrate its 50th anniversary at its annual conference this October, we carry with us lessons learned around accessibility and technology from last year's virtual conference, which broke attendance records.

Last but not least, despite our many political party affiliations, I am hopeful for the return of civil and compassionate leadership in our government, the value of facts and science in support of our fragile environment, and calls for unity—not division—from the highest elected office in our country. I am hopeful that a torn and divided nation can come back together to collectively face the days ahead.

As an organization, NOMA is facing challenges as well, but good ones: Our membership has doubled over the last two years, and we continue to expand our team and staff to meet the growing needs of our members and to reinforce the value of being a part of NOMA. NOMA strategically reinforces its own pipeline by mentoring up-and-coming leadership across our ranks. Presidents-elect have two years to watch and learn before they take office.

Since 2019, I have worked alongside NOMA leadership to help ensure the success of our programs and initiatives. I plan to expand and amplify local programming by our student and professional chapters and ensure it dovetails with our new national platform to "Educate, Elevate, and Empower" our membership base and our chapters across the country.

While last year was difficult, change is also hard. But I have much to be hopeful for and knowing that I'm not alone is reason enough to continue.

Jason Pugh, AIA, is NOMA's 2021–2022 president and a Chicago-based senior associate architect and urban designer at Gensler.

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Architectural Lighting: Opportunities for Innovation

TEXT BY MURRYE BERNARD, AIA

The COVID-19 pandemic has changed the way we occupy spaces—and if we do at all. In whatever the new normal will become, lighting and the field's ever-advancing innovations will remain crucial to creating environments that are welcoming, productive, intimate, and alluring. Here, six designers share their expectations and hopes for architectural lighting in 2021.

Ocean Prime restaurant, in Chicago, by GGLD

Gwen Grossman
Principal, Gwen Grossman Lighting Design, Chicago
People want tangible interactions and live engagements because experiences are memorable. Technology helps lighting designers bring art to life with new products and controls that allow our imaginations to run free, sometimes at what appears to be the touch of a fingertip. In the 2020s, people will want human connection, and lighting is a clear pathway to these experiences. Lighting is a true art form. Light is life.

Robert Sonneman
Founder and chief creative officer, Sonneman—A Way of Light, Larchmont, N.Y.
Technology continues to refine and elevate lighting performance. Electronically integrated lighting devices have become more compact, efficient, and capable of increasing controllability across more data platforms. Moving forward, the pace of innovation is permitting a reimagining of form factors, applications, and experience that should be integrated into the architectural vision of projects.

Alexandra Pappas-Kalber
Partner, Sighte Studio, Delray Beach, Fla.
Lighting firms that continue to support their design staff's abilities to work from home and find their own balance between professional and personal responsibilities will be the ones that retain talent. I hope that the lighting design industry abandons expectations of 60-plus-hour weeks and embraces the value of rest and personal fulfillment in creating inspired work.

Abhay Wadhwa
CEO and design principal, AWA Lighting Designers, New York
Tectonic shifts are occurring in lighting hardware. For example, we can now use a planar light source (OLEP), which looks like a big sheet of paper: Entire walls and ceilings can glow with light. The new world may be shadowless—or a perceived single source can provide multiple shadows. All of our art and cinema has shown point sources with single shadows, but now the reality is different.

Gregg Mackell
Founding principal, 186 Lighting Design Group, Denver
In a few years, increased technological functionality will be built into smaller, more adjustable, and more aesthetically pleasing sources. [Lighting technologies are] so complicated that even someone like me with 30 years of experience is learning on the job every day. When designers can specify adjustable downlights and decorative, linear, step, track, and landscape lights that work together harmoniously, this convergence will have the biggest impact on lighting design.

Francesca Bastianini
Partner, Sighte Studio, New York
The pandemic has highlighted systemic disparities, and social justice movements are resurging in response to incidents of police brutality against Black and brown individuals. We need to incorporate community engagement in our standard design process and create opportunities to make our firms as diverse and inclusive as the world we design for.

CHRIS CASELLA

> *To read the full predictions from these lighting and design experts, visit bit.ly/ArchLighting.*

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Residential:

Mason on Mariposa
San Francisco
David Baker Architects

TEXT BY MADELEINE D'ANGELO

A few years ago, when David Baker Architects began work on Mason on Mariposa, a mixed-use project in the Portrero Hill neighborhood of San Francisco, it marked a return to the firm's past. Directly across the street from the new site, in the 1990s, the San Francisco–based firm had completed its 92 Lofts, transforming an abandoned railroad tunnel into a sloped collection of lofts and apartments. Now DBA was tasked with designing a new development along that same rail line. The resulting three-building, 413,150-square-foot project, completed last June, turned a 3.4-acre parking lot into a residential hub that aspires to make connections with the surrounding community.

Spanning a city block between 18th Street and Mariposa Street, the project began with an unexpected discovery: an underground creek hidden below the rail line. "We dug a hole and there was this giant pipe, which was not on any of the maps because they put it down in the 19th century," says DBA founding principal David Baker, FAIA. Instead of building atop the creek, the architects extended an existing easement along its path, creating a greenway connected to a "fine-grained network" of public mews. "By defining those mews, they more or less instantly became a part of a network of neighborhood streets and passageways," Baker says.

Mason on Mariposa comprises three separate buildings, each framing the project's greenway. A mixed-use

Located across from Jackson Playground, the mixed-use project invites neighborhood interaction.

Site Plan

ADAM POTTS

> *To see more images of this project and extended project credits, visit bit.ly/ARDBAmason.*

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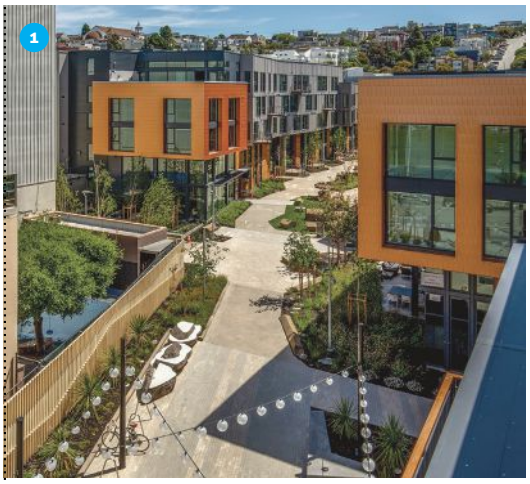
Residential:
David Baker Architects

building, designed by the local firm BAR Architects, sits on the site's northwest corner and contains a leasing office and 5,500 square feet of retail space. It serves as an entry point for Mason West and Mason East, the project's two residential structures. Between them, the three buildings contain 299 units, from studios to three-bedroom apartments, 62 of which are designated as market-rate, affordable housing.

DBA relied on a simple material pallet to create cohesion between the structures, as well as the firm's 92 Lofts. The architects balanced affordable materials, such as Hardie board random batten siding, with higher-end accents, including zinc bays and a copper façade for the leasing pavilion. Touches of durable, FSC-certified tropical hardwoods add a warmth to the residential balconies, ground-level stoops, and the façades of Mason East and West, creating a welcoming public space.

The public greenway's thoughtful curves further encourage moments of community. Designed by the local urban design collective Fletcher Studio, the space is "based on the way the creeks flow" and "creates social eddies," says founding principal David Fletcher.

That's one of Mason on Mariposa's defining ambitions: to attract a community of residents, neighbors, and pedestrians alike. We wanted to "do something that is part of the city, part of the urban fabric," Baker says. "We want it to be good for a long time."



1. A custom lighting scheme and Accoya wood fence by Fletcher Studio accentuate the project's network of public mews. **2.** Flow-through planters harvest rainwater from rooftops, the courtyard, and private patios and treat the water on-site. **3.** DBA designed a setback along Arkansas Street to make room for residential stoops. **4.** Breezeways connect the two residential buildings.

Project Credits
Project: Mason on Mariposa, San Francisco
Client: Related California
Design Architect: David Baker Architects, San Francisco · David Baker, FAIA (principal), Daniel Simons, FAIA (principal), Stephen Doherty, AIA (associate), Yes Duffy, AIA (former associate)
Landscape Architect: Fletcher Studio
Structural Engineer: DCI Engineers
Contractor: GL Builders
Size: 413,150 square feet (project), 146,284 (site)
Cost: $130,000,000

1: CRAIG COZART; 2–4: ADAM POTTS



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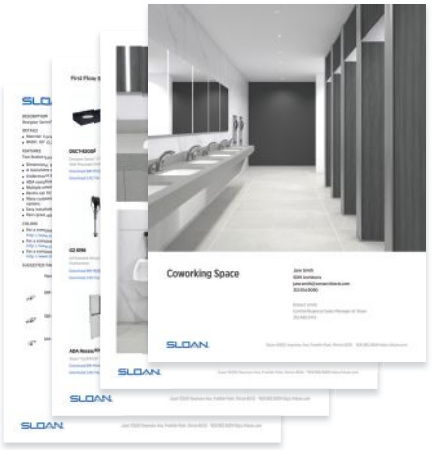

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CarbonPositive: A Zero-Carbon Building Sector by 2040

TEXT BY EDWARD MAZRIA, FAIA

The past four years have been trying in many ways, but for the architecture, planning, and building community, they also have been an urgent call to action to rapidly decarbonize the building sector. The good news is that the U.S. building sector and built environment are now within reach of achieving zero carbon (CO_2) emissions by 2040.

According to the U.S. Energy Information Administration, the building sector's 2020 operating carbon emissions was 27% below 2005 levels. In other words, the building sector not only met the U.S. commitment to the United Nations Framework Convention on Climate Change Paris Agreement of a 26% to 28% reduction from 2005 emissions levels, but it also achieved the goal *five years ahead* of the 2025 target date.

How did this happen? Though the U.S. has added more than 50 billion square feet to its building stock since 2005, energy consumption in the building sector stabilized in 2005 and has not increased since. New and existing buildings are designed and constructed more efficiently each year, and the U.S. has transitioned to cleaner fuels and renewables.

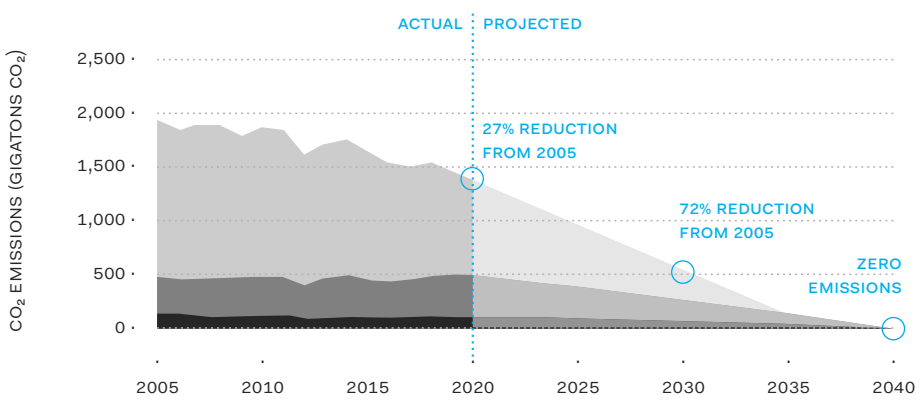
Since the building sector consumes approximately 74% of the electricity generated in the U.S., the Biden administration's "Plan for a Clean Energy Revolution and Environmental Justice," which aims for carbon-free electricity by 2035, would reduce the building sector's carbon emissions further, by about 60% below 2005 levels by 2030. With the addition of federal, state, and local government incentives and policies for energy-efficient building upgrades, electrification, and the adoption of more efficient and zero-carbon building codes, the building sector can achieve a 72% reduction by 2030 and phase out carbon emissions completely by 2040.

The world is already experiencing the devastating impacts of climate change. With solar and wind as now the cheapest and cleanest energy sources in the U.S. and around the globe, limiting average global temperatures to an increase of 1.5°C while addressing energy poverty is both feasible and profitable.

In November, world leaders will meet at the U.N. Climate Change Conference of the Parties to establish new 2030 emissions reduction targets. The European Union and the U.K. recently set targets of 55% and 68%, respectively, as compared to their 1990 levels. After the U.S. rejoins the Paris Agreement, it will offer an emissions reduction pledge and outline how it will cut emissions by 2030.

With the Biden administration's climate and clean energy plan and the building sector's demonstrated emissions reductions, the U.S. can re-establish its international leadership role at COP26 by *meeting or exceeding* the U.K.'s 68% target and by re-engaging the leaders of the major carbon-emitting nations to join in making 1.5°C global warming–compatible commitments.

U.S. Building Sector Operating Carbon Emissions
2005–2040 trend to meet the Paris Agreement's 1.5°C warming target



Biden Clean Energy Plan Contributions
Zero emissions grid by 2035

Incentives for energy efficiency, electrification, and building code adoption

State and Local Government Contribution
Policies for energy efficiency, electrification, and building code adoption

SOURCE: ARCHITECTURE 2030; U.S. EIA ANNUAL ENERGY OUTLOOKS

> *To read the full text by Edward Mazria, visit bit.ly/ARcp0121.*

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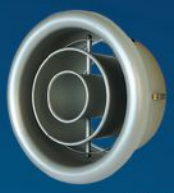
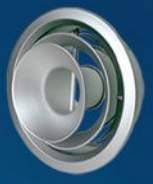


Model:**NT**
4"- 24" Aluminum



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Commercial building fenestrations—windows, doors, and skylights—can add aesthetic value to a project, but can also pose risks to an otherwise sound design. Any point at which a wall meets a window, the building's water-resistive barrier is vulnerable to potential failure.

Air is always looking for cracks and openings to pass through—that's just science. And since air carries moisture, any air leak can be a source of moisture intrusion to inside the building.

Window openings are notoriously difficult areas for contractors to get the water-resistive barrier right, often due to improper wrap and flashing installation. So, if air and water are going to leak through the wall anywhere, chances are it will be at the window or door.

To keep your design reputation from going out the window, make sure your designs maintain an optimal water-resistive barrier, while still looking just as you envisioned.

Step-by-Step Accuracy is Key

Understanding how to properly protect critical details of a water-resistive barrier and air barrier along window openings is essential to designing a tight envelope—one that won't fail early in the life of the building.

Breakdowns in constructability from the design stage to implementation can lead to final design concessions and improper material use—leaving no one happy in the end. Therefore, it's important to understand the necessary sequence of WRB-AB installation to work backwards when designing a successfully tight envelope.

After the exterior-side wall framing is assembled, the construction team will install the sheathing over the frame, cutting around all window openings and other fenestrations. Depending on the sheathing and WRB-AB materials specified, the contractors will then need to apply a self-adhered membrane, building wrap, or fluid-applied water-resistive barrier. But if you design the wall assembly to integrate the sheathing with the WRB-AB, you combine the installation of both systems into one step—saving the project time, labor, and material costs.

The most important aspect of protecting the building against water intrusion is creating a durable, reliable, and consistent barrier around the entire envelope—including at all fenestration openings. Using an integrated sheathing and water-resistive barrier system is the most productive approach to help ensure that the materials will work correctly together, without concerns about proper installation sequencing or incompatibility between products.

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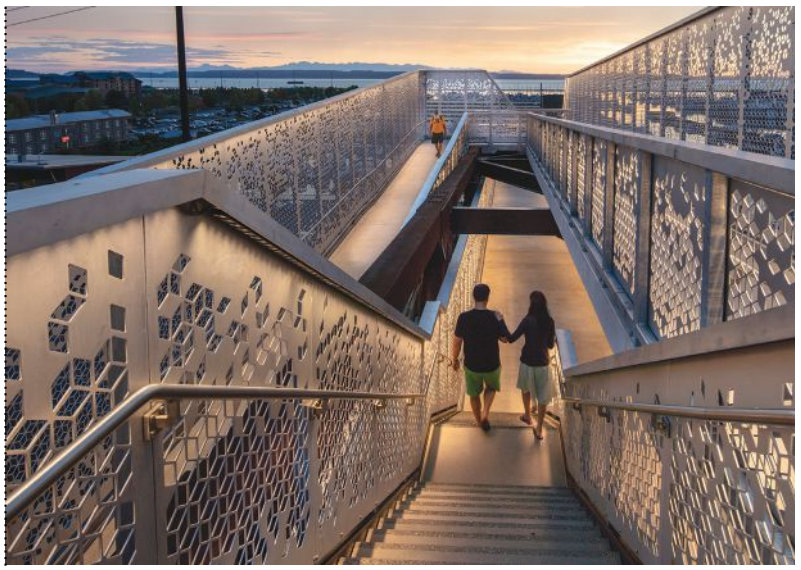
Typology:

Grand Avenue Park Bridge
Everett, Wash.
LMN Architects

TEXT BY IAN VOLNER

For Seattle-based LMN Architects, the commission to design the Grand Avenue Park Bridge in Everett, Wash., was a chance to extend the firm's long-standing commitment to architecture in the public interest—particularly its pursuit of infrastructure projects, which have become something of an in-house specialty. "We shouldn't just look at the parts of the world around us that aren't capital-A Architecture and see them as void of opportunity, void of inspiration," says LMN partner Stephen Van Dyck, AIA. "There are lots of ways to inspire people with typologies that aren't considered conventionally sexy by the profession."

The firm's long run of successful transportation-related projects (including a brand-new multimodal ferry terminal in Mukilteo, just north of Seattle) made LMN a natural choice for the 257-foot bridge. Everett, a coastal community, has long been disconnected from its coastline along Possession Sound. "It's always been a manufacturing-based town," says Van Dyck. Industrial and shipping facilities have dominated the waterfront, while a major north-south freeway and adjacent train tracks effectively severed the coastline from the bluff-top residential neighborhoods on the town's west side. In recent years, however, new commercial and



The walkway scissors down from the bluff, leading pedestrians to the bridge's main span.

ADAM HUNTER/LMN ARCHITECTS

Typology:
LMN Architects

recreational development have crept down the hill; the area, says Van Dyck, has "blossomed," necessitating new and improved ways to reach it.

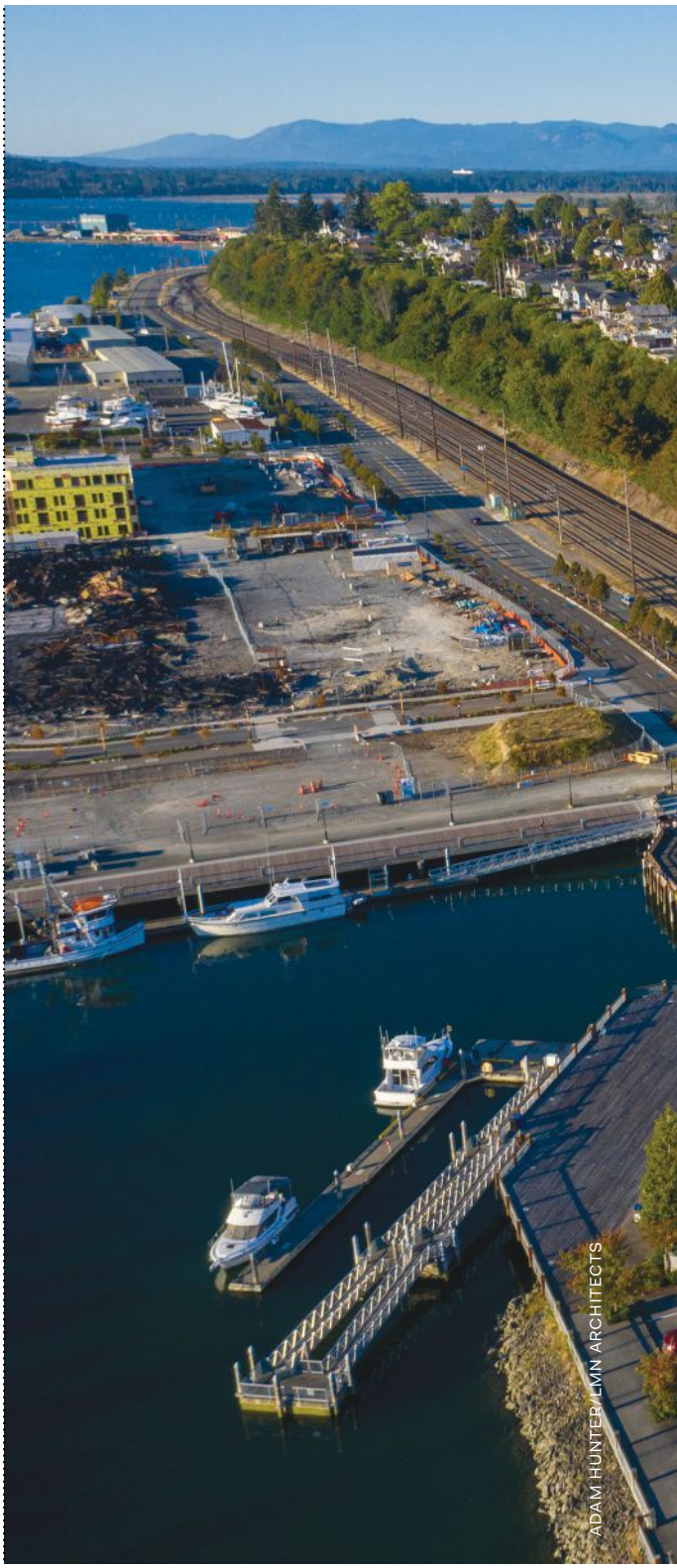
Using durable, unpretentious materials—raw concrete, rough steel—LMN succeeded in making the bridge a celebration of movement and urban life. It connects a small park (designed by the city's official architect) with the historic docks below, rising over the intervening road and railway in a single bound. It's a leap made possible by a steel truss that's anchored in the cliff face on one side, and in a tall, concrete tower on the other side. The tower is a striking presence, an emphatic coda to the architectural procession.

Contextually, the truss was a perfect fit: The open structure of braces and struts is an obvious nod to the classic railroad bridges of America. Sturdy and economical, the simple frame also gave the designers some flexibility in the arrangement of the walkway, which scissors downward from the park in two stages to guide pedestrians gently westward from the ridge top, before carrying them over the main span towards a staircase and elevator in the concrete volume on the coastal side. Hidden beneath the deck, drainage pipes and other technical systems are out of sight to all but passing motorists and conductors.

But the design's real allure lies in what its users can see as they stroll the length of span. Doing triple duty as a safety rail, a brise soleil, and a decorative add-on, a series of aluminum panels decorate the sides of the walkways and turn the bridge into an eye-catching piece of infrastructure. As LMN's Scott Crawford, ASSOC. AIA, recalls: "We started looking at aluminum plate—a material that could be left bare but that you could also put some kind of pattern on." Local contractors used a digitally guided CNC waterjet to slice rhomboid forms into the aluminum, with no two panels alike. By day, the pattern casts hypnotic shadows on the deck; by night, the effect is even more dramatic, with concealed LED lighting setting the whole bridge aglow with a spectacular, strangely tactile shimmer.

Thanks to the firm's familiarity with parametric design, as well as a collaborative spirit that brought together the project's engineers and fabricators, Crawford says, LMN was able "to push our concept forward without delaying the overall trajectory." Since its opening in August last year, the bridge has been a hit with locals and visitors alike, who have found it to be a destination in itself.

Project Credits
Project: Grand Avenue Park Bridge, Everett, Wash.
Client: City of Everett
Design Architect: LMN Architects, Seattle · Scott Crawford, ASSOC. AIA, Kyle Kiser, AIA, Mark La Venture, AIA, Kathy Stallings, Stephen Van Dyck, AIA, John Woloszyn, AIA
Structural/Civil Engineer: KPFF Consulting Engineers
Mechanical Engineer: Tres West Engineers
Electrical Engineer: Stantec Consulting Services
Contractor: Interwest Construction
Cost: $20,000,000



ADAM HUNTER/LMN ARCHITECTS

The bridge, designed using raw steel and concrete, celebrates movement and urban life as it connects the bluff with the coastline.

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The Future of Urbanization

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LEARNING OBJECTIVES

1. Describe how a circular economy can help the building industry meet requirements for sustainable, resilient, and beautiful buildings.
2. Explore the Future of Energy Reduction through high-performance insulation, sealants, reflective roof coatings, and Negative Emissions Technologies.
3. Identify innovative technologies that contribute to the Future of Power Supply for our cities, including protective coatings for wind turbines and wind turbine blades made with polyurethane resins that reduce weight.
4. Explore the Future of Efficient Construction and how high-performance materials enable housing to be constructed fast, sustainably, and on a budget.

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THE CIRCULAR ECONOMY—CLOSING THE LOOP TO PROTECT THE CLIMATE AND NATURAL RESOURCES[1]

Today, more than half of us live in cities, and by 2050, this proportion is expected to increase to 67%. As urbanization becomes a global trend, the struggle to efficiently and sustainably grow our cities will only intensify. More people need more buildings, more energy, and more infrastructure, which puts increased pressure on resources and the environment.

Climate change, population growth, and unsustainable lifestyles are surmounting global challenges that require embracing a circular economy as a guiding light. Producing, consuming, and disposing often works like a one-way street, but this linear economy of "take, make, waste" production and consumption isn't compatible with the challenges facing the world today. To take on climate change and preserve our planet, we have to move away from a single-use mindset and embed circular economic principles into design and living. The circular economy is the key to protecting the climate and natural resources.

Our society must find new ways of putting our world's limited resources to good use—and reuse. This means making products that last for as long as possible, avoiding waste, and viewing used products as a resource, recovering everything we can from them to recycle along the value chain. It also means exploring alternative sources of sustainable raw materials to replace fossil resources, such as used materials, waste, biomass, and even CO_2 itself. Innovative recycling uses energy-efficient technologies that allow more used products and waste to be recycled. On top of it all, there's renewable energy, which is needed to power a truly resource-efficient economy. Clean energy such as wind and sun must power the circular economy, and joint solutions such as cross-industry collaboration are needed to bring the circular economy forward.

Transitioning to this kind of circular world is a visionary project for society as a whole, and it's gaining traction. By working together, we can power the shift, helping make our planet a more sustainable, healthier, cleaner place to live. In accelerating this transition, the building industry and all the suppliers of raw materials and building products have a prominent role to play. Buildings are the backbone of where we live, work, and play and are therefore the key to solving many of today's pressing issues.

MEETING THE BUILDING INDUSTRY'S REQUIREMENTS FOR SUSTAINABLE, RESILIENT, AND BEAUTIFUL BUILDINGS[2]

The global challenges we face can seem daunting, but the good news is that raw material suppliers and building product manufacturers are creating innovative solutions that can help the building industry rise to meet these challenges in order to build the sustainable and resilient cities of the future. Today's architects, engineers, and contractors rely on these high-performance materials and technologies to design buildings that are not only durable, energy efficient, and resilient, but are also attractive and comfortable for end-users.

Sustainable Solutions

A growing number of building product manufacturers are committed to creating sustainable solutions for a variety of applications to improve quality of life and preserve the environment. In the building and construction industry, this takes the form of advanced materials such as those for efficient insulation and low-volatile organic compound (VOC) coating products, among others. For example, many products made with polyurethane raw materials, such as spray polyurethane foam, not only have a low global warming potential throughout their lifecycle, but also contribute to a building's energy efficiency because of their highly insulative properties. Whether for the facade, walls, roof, windows, or floors, spray polyurethane foam is ideal for applications in the residential and commercial building sectors.

A growing number of building product manufacturers are committed to creating sustainable solutions for a variety of applications to improve quality of life and preserve the environment. In the building and construction industry, this takes the form of advanced materials such as those for efficient insulation and low-volatile organic compound (VOC) coating products, among others.

GLOSSARY

Carbon Sequestration—The process of capturing and storing atmospheric carbon dioxide to reduce the amount of carbon dioxide in the atmosphere and therefore reduce global climate change

Circular Economy—A systemic approach to economic development designed to benefit businesses, society, and the environment; in contrast to the 'take-make-waste' linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources[21]

Cool Colored Roofing—Conventional roofing materials produced in pigments that have a high solar reflectivity and are minimally heated by the sun

Fluid-Applied Roof Coatings—One or two component aliphatic polyurethane coatings that are formulated with flow and leveling aids, solvents to reduce the working viscosity, and pigments to reflect the heat-generating infrared (IR) wavelengths of sunlight off the roof surface

Mass Timber—A form of construction that uses large, prefabricated wood panels such as cross-laminated timber, nail-laminated timber, dowel-laminated timber, and glue-laminated timber that provide exceptional strength and stability

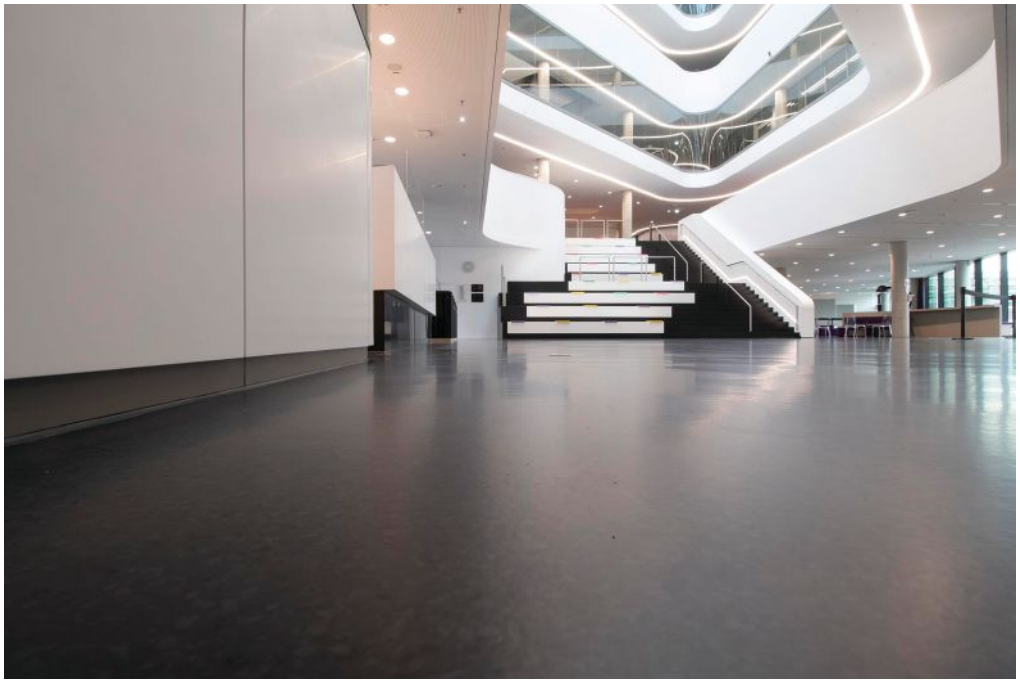
Negative Emissions Technologies (NETs)—Technologies that remove CO_2 that is already in the atmosphere

Panelized Wall Assembly—Prefabricated wall panels that consist of a lumber frame filled with variable spray polyurethane foam (SPF) for continuous, energy-efficient insulation

Polyurethane (PU) Infusion Resin Systems—High-performance resins used to manufacture wind turbine blades that reduce weight, allow for the walls of the blade to be thinner, and cure faster to improve productivity

Polyurethane (PUR/PU) and Polyisocyanurate (PIR) Rigid Foam Insulation—A high-performance, lightweight, durable, and easy-to-install material that helps bring architects' vision for an energy-efficient, low-maintenance, safe, sustainable, and beautiful built environment to life

Zero Net Carbon (ZNC) Building—A highly energy efficient building that produces (on-site) or procures enough carbon-free renewable energy to meet annual building operation energy consumption



Coating manufacturers turn to advanced-performance waterborne polyurethane floor coatings and adhesives, which contain ultra-low-to-zero VOC content, for a durable solution to extend product life in heavily trafficked areas while limiting air infiltration.

Reduced energy consumption also supports sustainability goals, as do innovative lightweight and durable materials that allow for design freedom not possible with traditional materials. Coating manufacturers turn to advanced-performance waterborne polyurethane floor coatings and adhesives, which contain ultra-low-to-zero VOC content, for a durable solution to extend product life in heavily trafficked areas while limiting air infiltration. Additionally, polyurethane based reflective roof coatings contribute to reducing the carbon footprint by lowering cooling needs as well as reducing the heat island effect in populated areas. These long lasting, waterproof coating systems also last longer, extending the roof life cycle and diverting additional waste from landfills from the eventual tear off and reroof process.

Raw Materials for Resilient Buildings

These products not only help lower energy consumption to enhance building efficiency, but also strengthen and support structures to withstand extreme weather events and maintain functionality. From urethane composites for windows and doors that enhance resistance to corrosion, rot, and projectiles, to high-durability wall coatings technology that stands up to harsh chemicals and frequent scrubbing, to polycarbonate glazing to withstand the elements and high loads—these materials help protect a building's roof, points of entry, and everything in between.

New Possibilities for Enhanced Aesthetics

Functionality and environmental compatibility count in the construction industry, but so do aesthetics. Modern architecture must not only be practical and eco-friendly, it also needs visual appeal. Raw materials and technologies for coatings provide two key benefits—durability and beauty. High-performance coatings incorporating these materials and technologies stand up to the elements and can withstand stressors like UV rays, abrasion, and frequent disinfection, all while maintaining a decorative finish. Polyurethane products, such as those found in insulated metal panels, offer a winning combination of superior performance, dynamic aesthetics, and sustainable attributes useful for direct-to-steel decks as well as roof and wall applications.

This is just a brief introduction to the wide variety of products that can help architects design resilient, more sustainable buildings. We will take a deeper dive into how these building materials, and new ones on the horizon, will improve the future of urbanization.

FUTURE OF ENERGY REDUCTION[3]

There's no place like home. Our homes are our sanctuaries, the places where we feel the most comfortable. Yet, cultivating these personal spaces can often harm the planet. Our houses and apartments use a remarkable amount of energy, primarily through heating, cooling, and water consumption. The International Energy Agency estimates our buildings are responsible for 36% of global energy consumption and nearly 40% of all CO_2 emissions.[4]

So, what would it take to build more energy efficient homes in the future?

When thinking about energy efficient homes of the future, most people conjure up images of shiny new structures complete with the latest eco-efficient technology. But a vast majority of the buildings that will make up our future cities already exist. A recent report from the UN found that 65% of building stock expected worldwide in 2060 has already been built, and most of these structures were not constructed with sustainability in mind. At the same time, however, climate change experts agree we should aim to have net-zero emissions by 2050.[5]

Do the math and the answer is clear—we need to work on improving energy-efficiency in existing structures—and quickly.

POLYURETHANE (PUR/PU) AND POLYISOCYANURATE (PIR) RIGID FOAM INSULATION[6]

Of course, it's only possible to start saving energy when you know where and how energy is being wasted. In the majority of old homes, upgrading insulation is the obvious place to start. Recent research by the North American Insulation Manufacturers Association concluded that up to 90% of existing U.S. homes are under insulated and leak up to 30% of the energy produced.[7] Retrofitting older homes and apartments with polyurethane (PU) insulation can reduce heat loss by up to 80% as well as significantly reduce energy consumption.

The International Energy Agency estimates our buildings are responsible for 36% of global energy consumption and nearly 40% of all CO_2 emissions.

Architects are already acutely aware that 40% of global energy consumption comes from buildings, which also emit more than a third of greenhouse gases. Rigid polyurethane (PUR/PU) and polyisocyanurate (PIR) foams are an interesting choice for architects who are striving to reduce both emissions and energy use, while also enabling them to cope with client design whims, stringent fire and safety regulations, and cost and logistical pressures on the building site. Rigid foam insulation is a high-performance, lightweight, durable, and easy-to-install material that helps bring architects' vision for an energy-efficient, low-maintenance, safe, sustainable, and beautiful built environment to life.

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QUIZ

1. Today, more than half of us live in cities, and by 2050, this proportion is expected to increase to _____ percent.
   a. 25 b. 52
   c. 67 d. 76

2. Which of the following is an important tenet of the Circular Economy?
   a. Making products that last b. Avoiding waste
   c. Viewing used products as resources d. Recycling
   e. All of the above

3. The International Energy Agency estimates our buildings are responsible for _____ percent of global energy consumption and nearly _____ percent of all CO_2 emissions.
   a. 25, 40 b. 36, 40
   c. 40, 36 d. 20, 25

4. Retrofitting older homes and apartments with polyurethane (PU) insulation can reduce heat loss by up to _____ percent as well as significantly reduce energy consumption.
   a. 50 b. 60
   c. 70 d. 80

5. _____ thermal insulation is highly effective because the micro pores in the foam are filled with gas, giving it the highest performance of any conventional insulating material.
   a. PUR/PIR b. Mineral wood
   c. Polystyrene d. SPF

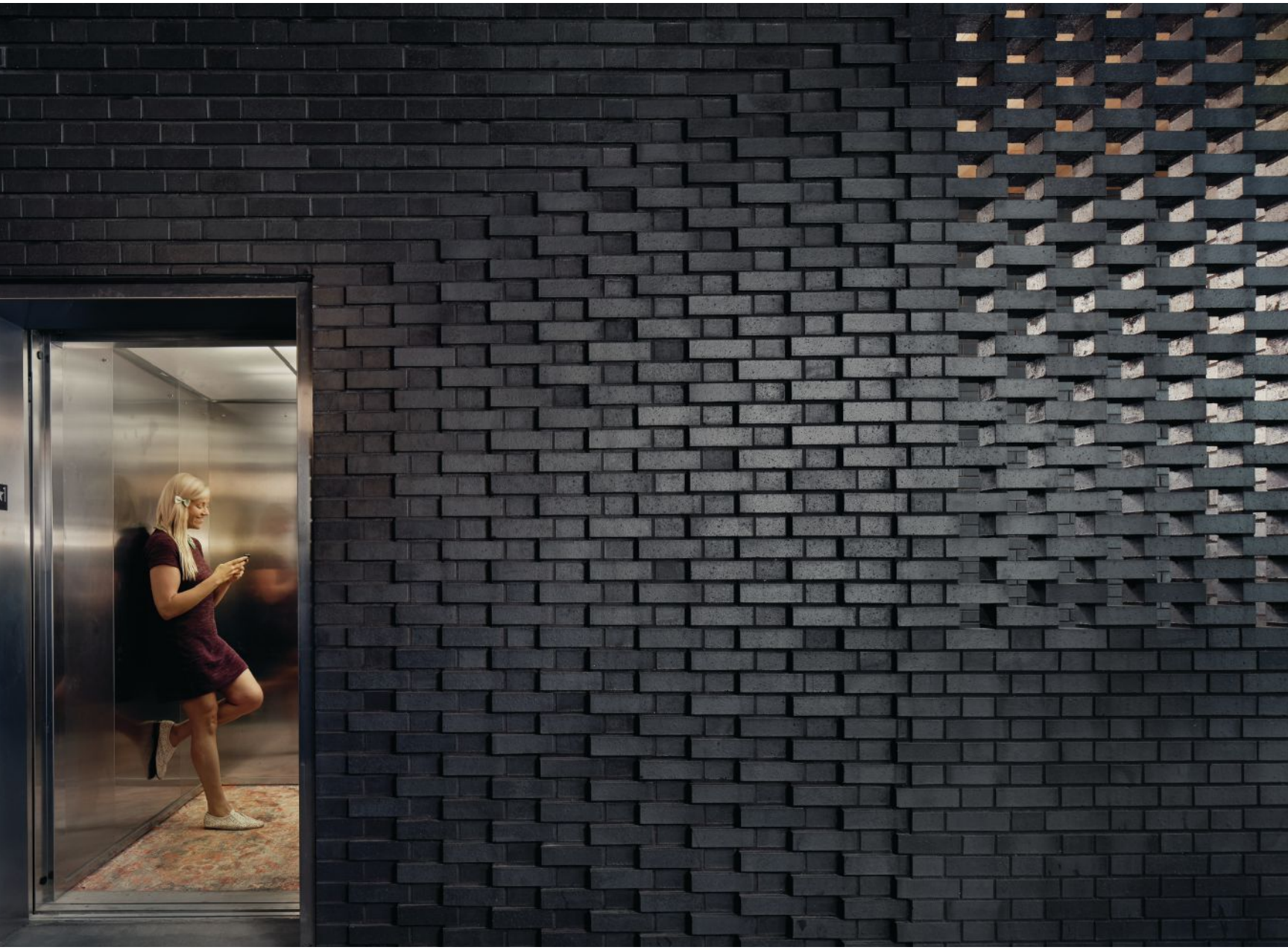
6. The benefits of which type of sealant include very little shrinkage, good flexibility, low modulus, excellent durability, and paintability?
   a. Moisture-cure 1K polyurethane b. 1K silane-terminated
   c. 2K polyurethane d. Polyurea

7. Which technology removes CO_2 from the atmosphere, then recycles it?
   a. Net Emissions b. Net Zero Carbon
   c. Silane Termination d. Carbon Conversion

8. White and tinted roof coatings contain transparent polymeric materials, such as polyurethane or acrylic, and a white and/or IR reflective pigment, to make them opaque and reflective; these coatings typically reflect _____ percent of the sun's energy.
   a. 20 to 40 b. 30 to 50
   c. 60 to 80 d. 70 to 90

9. Which of the following is a benefit of using high-performance polyurethane (PU) infusion resin systems to manufacture large wind turbine blades?
   a. Reduced weight b. Longer, stronger blades
   c. Thinner blades d. Superior bonding
   e. All of the above

10. The panelized wall system discussed in this course arrives on site ready to install and goes up as much as _____ percent faster than conventional methods – with less jobsite waste, for greener, more economical buildings.
    a. 25 b. 50
    c. 75 d. 100



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Taking What Comes

Although architects are resilient, it helps to have a holistic approach to challenges.

Baani Singh, AIA, has already weathered one recession in her architectural career. After being let go in 2012 during a round of layoffs at the large firm where she worked in Albany, N.Y., she took a job as a consultant at New York City's Department of Health and Mental Hygiene-Center for Active Design. Today, as principal of her own firm, D2D Green Architecture, she continues to use active design tenets to promote health and wellness in the built environment—while remaining resilient in the face of uncertainty.

As told to Katherine Flynn

After my role at Center for Active Design, I decided to continue working in design and sustainability and focus on green design's more all-inclusive approach—including wellness, energy efficiency, carbon reduction, product life cycle, and healthy materials. With that holistic approach in mind, my firm started growing. At D2D, we offer various services including architecture, sustainability consulting, and interior design, and work on a versatile portfolio of building types and markets. Being able to offer diversified services to a variety of clients will be key in the post-pandemic times, because if there is a lack of projects in one [sector], we can depend on another.

I started the practice remotely to be able to take care of my daughter. Now, I have employees in North Carolina, New Jersey, New York City, and Albany, N.Y. We're scattered, and so far, it has worked out great for us to keep the practice virtual and tap into amazing talent wherever we find it. We all work together with the same holistic principles. It was a blessing that our whole team was used to working remotely and we did not have to change a thing to adjust during these uncertain times, though we are doing more team building online than we did before the pandemic.

Architects are resilient. We can quickly adapt to the changing environment and technology. Virtual practice reduces our overhead and gives us flexibility to hire talented people and promote racial, ethnic, and gender diversity. As a woman and minority business owner, I can relate to the challenges faced by women and minorities in the industry. I want my practice to encourage growth and provide work-life balance for everyone.

I think we are successful because we respect everyone's opinions. While working on our COVID and post-COVID strategies, we asked everybody at the firm: "These are our plans. What are your thoughts?" You never know where solutions might come from. In addition, diversity also helps us with critical thinking and creative solutions.

I'm from India, and I think it's important for a firm principal to not only be inclusive, but also have the principle of "chardikala." That means being in positive spirits and taking everything as it comes. Whatever is coming in my life and my business—for example, projects are currently going on hold as we mostly do government work—we rely on the principle of "chardikala." Results are not under our control, but our actions are. If the decision-makers in the firm are in positive spirits, it trickles down to the entire team. AIA

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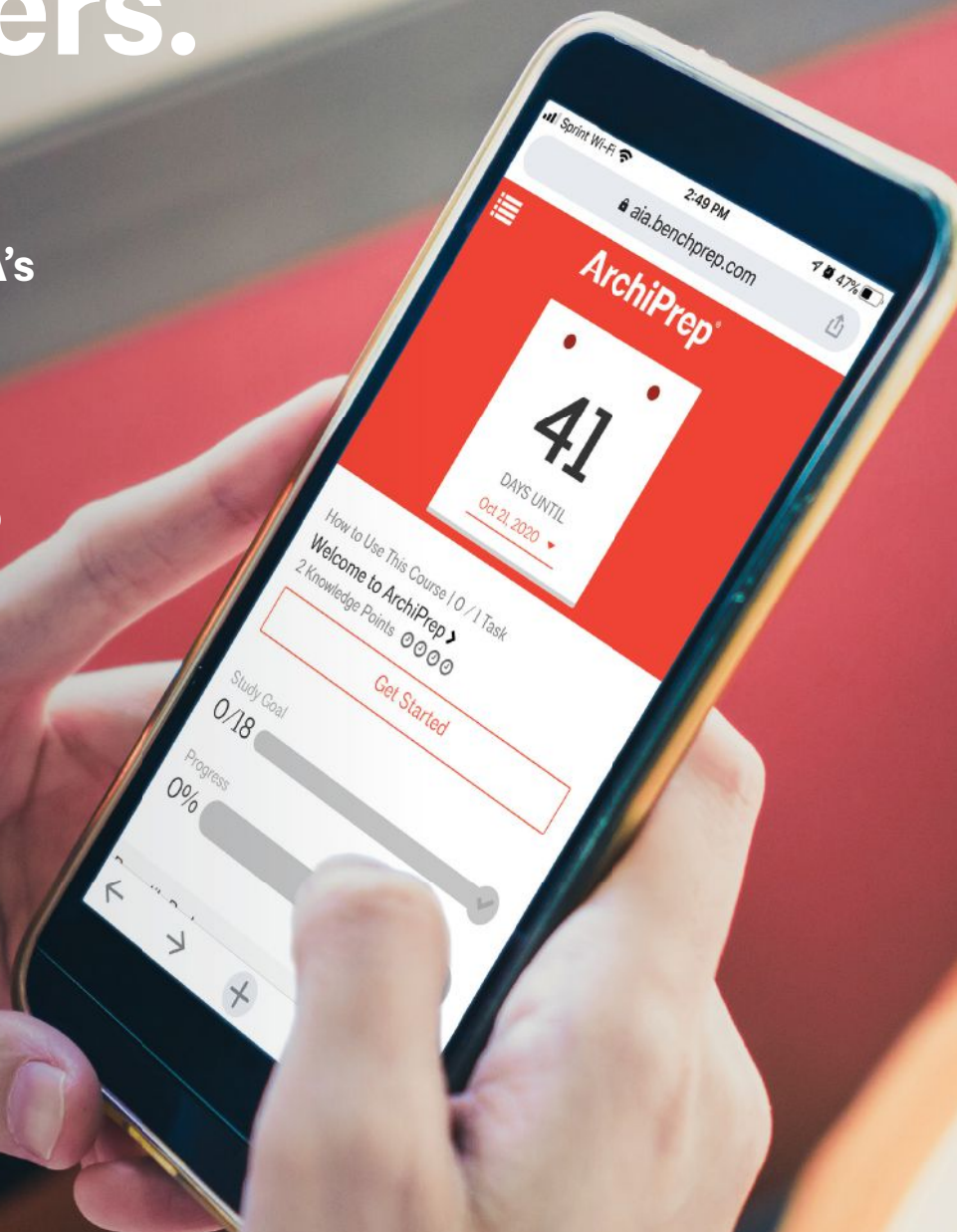

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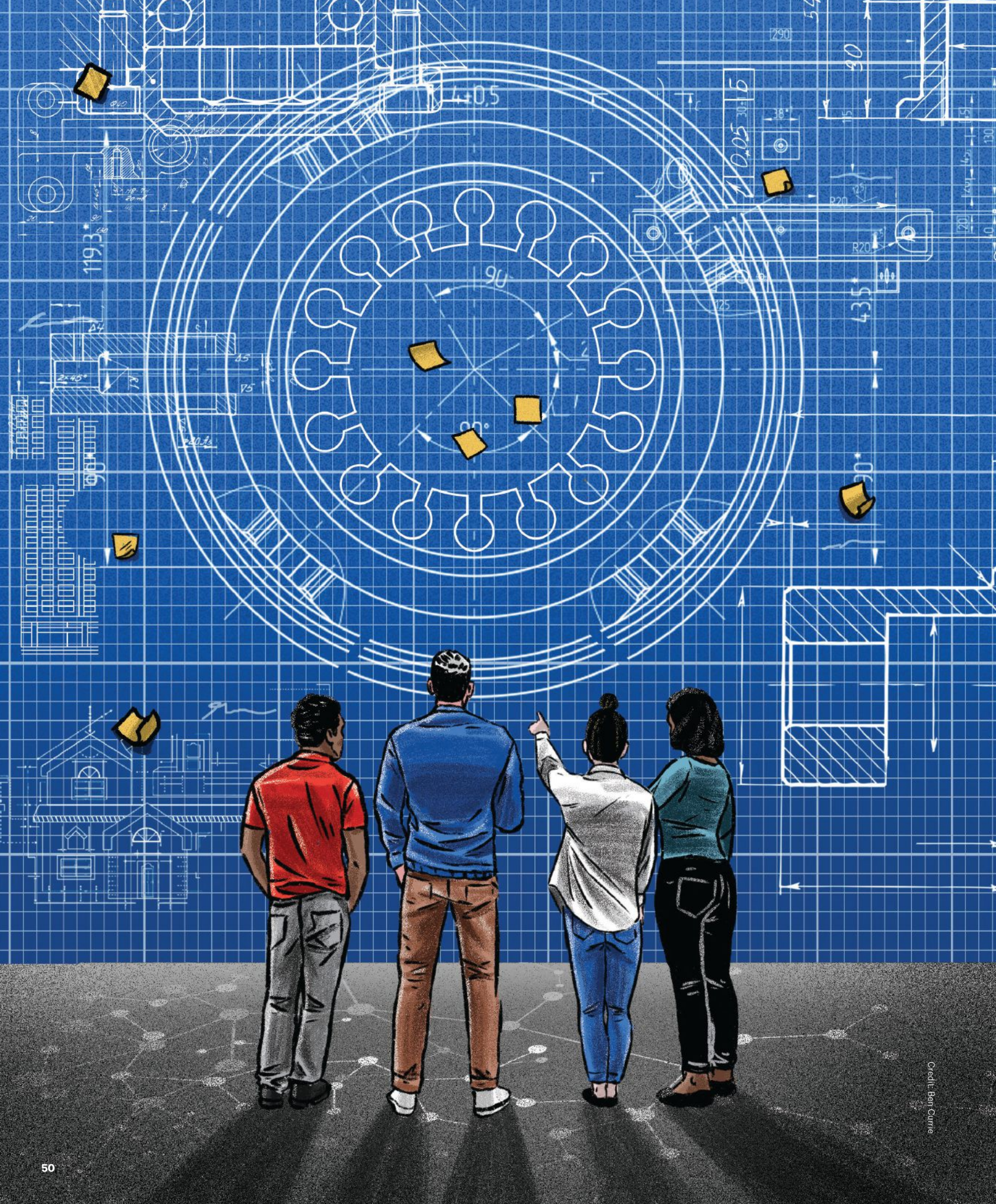
Strong Showing for Existing Building Projects

By Michele Russo

Forty-nine percent of architecture firm billings were dedicated to existing building projects in 2019—a 5-point increase from 2017. That percentage should continue to grow as firms respond to design needs revealed by the pandemic and opt to reduce their environmental impact by not building new. With an estimated 40% of the U.S. building stock comprised of buildings over 50 years old, there remain notable opportunites for architects in the existing building marketplace. AIA



Credit: Ben Currie

Redesigning a Post-Pandemic Practice

Firms face the dual challenge of rebuilding their revenue base while restoring staff morale and firm culture.

By Kermit Baker, HON. AIA

Before the pandemic hit in early 2020, most architecture firms were expecting another year of solid (if unspectacular) revenue growth. Almost half of firms expected to see billings increase at least 5%, a quarter projected declines of that magnitude, and the rest anticipated revenue close to 2019 levels. The biggest business concerns for firms entering 2020 were how to increase profitability, manage escalating overhead costs, work out ownership transition issues, and find new qualified staff to fill positions that they were planning to add or replace.

However, as the fallout from the pandemic began to intensify in March, many projects underway or planned suddenly had an unclear future, and firm leaders faced a period of unprecedented uncertainty. Over a two-month span beginning in March, our economy lost over 22 million payroll positions, and the national unemployment rate rocketed up from 3.5% to 14.7%. Consumer confidence in current conditions and expectations of future conditions each dropped by about 30% over this period.

Design and construction, while certainly not among the worst hit sectors in our economy, still felt the fallout. AIA's Architecture Billings Index saw the steepest monthly decline in its 25-year history in the spring of 2020, in part because there were fewer new projects, but also because existing projects were running into problems. A survey of architecture firms conducted in September 2020 found that on a dollar basis, over half of all pre-pandemic active projects had been negatively affected by the recession. The most common cause was delays imposed by clients, contractors, or local and state governments. And a significant number of projects were put on indefinite hold or canceled.

Planning for the Coming Year

With promising news on the COVID-19 vaccine front, architecture firms are anticipating a return to more normal times. However, the bridge from the current situation to better market conditions will undoubtedly be challenging. While the slowdown in billings nationally has moderated in recent months, firms don't believe that a return to growth will happen anytime soon. Almost half of architecture firms expect their billings this year to decline 5% or more from 2020 levels, according to an AIA survey conducted in October 2020. In a bit of good news, just over a quarter of firms are expecting growth in billings in 2021.

The outlook for this year varies a lot by a firm's specialty. A surprisingly strong residential market—particularly for new single-family homes and home improvement projects, but also for more affordable multifamily units—has produced healthy project workloads for most firms specializing in this sector. Indeed, almost twice as many multifamily residential firms are expecting growth in billings of at least 5% this year as are expecting a decline of that magnitude. For firms specializing in commercial, industrial, or institutional facilities, it is just the reverse. More than twice as many firms with these specializations are expecting declines as are expecting growth this year.

However, firms of all specialties, sizes, and locations are expecting a challenging year ahead. For most firms, the sudden and steep economic downturn has left them struggling to retain their existing clients and projects, while simultaneously scrambling to find new projects. And virtually all firms have been dealing with a new set of issues—operating a practice in a pandemic and post-pandemic world.

Some problems atop the list of firm business concerns for 2021 are chronic. When asked to list their top three concerns for the coming year, 29% mentioned increasing firm profitability—the top response from the extensive list offered to them. It was also the most frequently cited

Figure 1: Architecture firms are projecting that revenue declines will continue into 2021

Estimated revenue change in 2021 vs. 2020, percent of firms

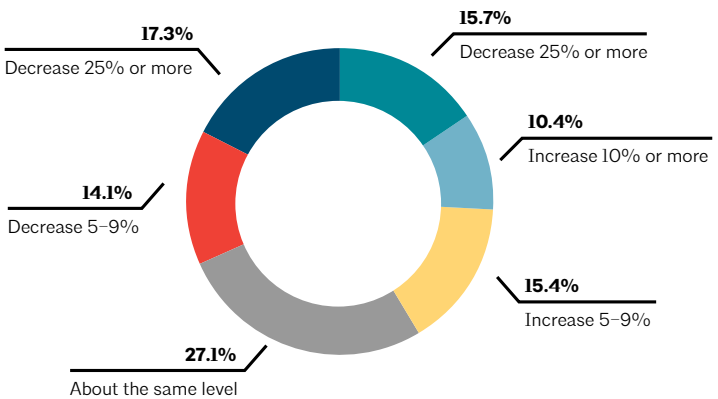


Figure 2: Pandemic related issues emerge as firms' top concerns for 2021

concern last year, when 28% mentioned profitability as one of their top three concerns, demonstrating that this is an ongoing challenge no matter the strength of the economy. Other concerns that topped the 2021 list that also ranked high a year ago are dealing with ownership transition issues (number 3 last year) and managing the rising cost of running a firm (number 4).

Fortunately, some concerns that were high on the list last year have largely disappeared this year. Given the extended period of growth in design and construction activity before this current recession, having adequate staffing to handle project workloads was a pervasive issue. Firm leaders mentioned "finding adequate staff"; "retaining staff"; and "offering competitive salaries and benefits" all as on their Top Ten list of concerns last year. With many firms reducing their payroll hours or headcounts this year, those staffing issues are no longer such a concern for most firms.

The changes to practice brought on by the pandemic within the last year have forced firms to operate very differently, and the prospects of running a practice post-pandemic are fraught with challenges.

Of the Top Ten business-related concerns for firms heading into 2021, four have direct connections either to operating conditions during the pandemic or to firm practices that will need to be addressed post-pandemic. These include:

- Maintaining levels of staff productivity while working remotely. Many firms understand that staff working remotely occasionally need to focus on household obligations instead of project work. Sensitive to this situation, many firms have enabled staff to vary their work hours, have encouraged staff to take more personal time, or have provided support in other ways.
- Retaining key staff until more business returns. During any extended period of economic weakness, firms need to walk a fine line between financial responsibility and retaining as many employees as possible so that they can rebuild their practices once the economy recovers.
- Rebuilding the firm's client base or finding new clients post-pandemic. While finding clients and projects can be a challenge even in the best of times, the pandemic offers a new set of marketing issues. Some established clients may be casualties of the pandemic. Other established clients may survive but will need to shift their design needs. Alternatively, given the way that the pandemic has fundamentally changed the economy, other potential clients and projects may emerge that are a good fit with the core competencies of a firm. Still, most firms will probably have to re-engineer their marketing strategies.
- Ensuring collaboration and communication among management and staff while working remotely. Many firms will have a significant share of their staff working remotely for a portion of this year. Some firms will choose to implement a permanent hybrid staffing situation, where a portion of their staff will work remotely some of the time or full-time. With a hybrid approach, some remote workers may have more difficulty interacting with the in-office staff.

2021 Outlook: Nervous, but Optimistic

Staring at a steep economic recession that looks to linger for a while, a worldwide pandemic that could be mostly reined in midyear by vaccines, a staff that likely needs a remedial course on collaboration and communication, and a firm culture that likely needs a major reboot after an extended period of remote work, firm leaders face a daunting list of issues. However, most are feeling fairly optimistic that they can overcome these obstacles.

When asked at the end of 2020 about whether 2021 would be a great, good, so-so, challenging, or potentially disastrous year for their firm, firm leaders were generally optimistic. Almost half expected it to be a good or great year, and another quarter expected it to be a so-so year. However, the level of their optimism depended greatly on the firm's specialization and the health of the local and regional markets that they serve.

Firms specializing in multifamily residential projects are typically feeling the warmth of the red-hot residential market, even if most of that activity is focused on single-family construction and the remodeling of existing homes. Still, over half (54%) of these firms are expecting at least a good year in 2021, with 12% anticipating a great year. Firms specializing in the commercial, industrial, or institutional sectors are a bit less sanguine about their prospects, but even so, about four in 10 of these firms are anticipating at least a good year, with about three in 10 expecting at least a challenging year. Regionally, firms in the Midwest are the most optimistic about their prospects for the year, and firms in the Northeast the least. In the Midwest, almost twice as many firms are expecting at least a good year as are expecting a challenging or potentially disastrous one. In the Northeast, those two groups are just about equal in size. No doubt there will be other issues as the year unfolds, but most firms seem to feel that the worst of this pandemic is behind them. AIA

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The Space Race

Record-high home sales, and a forecast remodeling boom, should bring big business to architects with a pulse on post-pandemic trends.

By Patrick Sisson

Like many executives, Kristine Anderson, AIA, recalls staring down her firm's budget this spring and looking for ways to make cuts. Anderson, a managing principal at Peterssen/Keller Architecture in Minneapolis, which focuses on upscale residential work, was facing the uncertainty of an economy entering a standstill and made the decision to trim her company's marketing spending. Would there even be business to try and capture?

That decision proved to be a good one—although not for the reason Anderson had anticipated. Nearly a year into a pandemic that reshaped the economy and the housing market, the architects at Peterssen/Keller have found that work is consistently coming their way.

"It's amazing the numbers of calls we've gotten without doing anything differently," Anderson says about a surprisingly busy second half of 2020.

In a year of dramatic shifts, the wholesale rebound—and even acceleration—of the single-family housing market has been a bright spot for an economy battered by shutdowns, lost jobs, and the tragedies of a pandemic. Twin trends—social distancing and remote work, and a large-scale shift in activity from commercial to residential spaces—have fueled a boom in home buying and remodeling that experts believe won't subside anytime soon, setting up extensive opportunities for residential architects. While the rental market flounders, with many moderate- and lower-income Americans struggling to stay housed, a bifurcated economy is allowing professionals who can still afford to take on a mortgage or renovate their home to weigh their options.

Anderson sees it in the requests she's fielding from potential clients, who desire more connection with the outside via landscaping and additional light, as well as separation, including acoustical treatments, extra space, even an office "shed" in the backyard for privacy and focus. Industry analysts agree. Todd Tomalak, who studies remodeling for John Burns Real Estate Consulting, predicts that as the economy opens with widespread distribution of a COVID-19 vaccine, there will be a "bull run" in major, wall-moving renovation projects. He forecasts 37% growth in such spending through 2023 as compared to 2020.

The desire for new homes, which reached a crescendo in late summer and early fall last year, is also expected to continue through 2021. From roughly August to November last year, sales nationally grew 60%, according to John Burns, the real estate analyst and CEO of his eponymous consulting firm. Homebuilders can't keep up; Robert Dietz, chief economist of the National Association of Home Builders, says that in October 2020, builders sold 28,000 homes that haven't been built yet, double the number of unbuilt homes sold in October 2019. Danielle Hale, chief economist at Realtor.com, expects home sales will end up 7% year-over-year in 2020. While the pandemic-induced "sugar high" of buyers scrambling to find more space and move to the suburbs will subside—a burst that brought home sales to a 14-year high this fall—she sees continued strong growth for the foreseeable future.

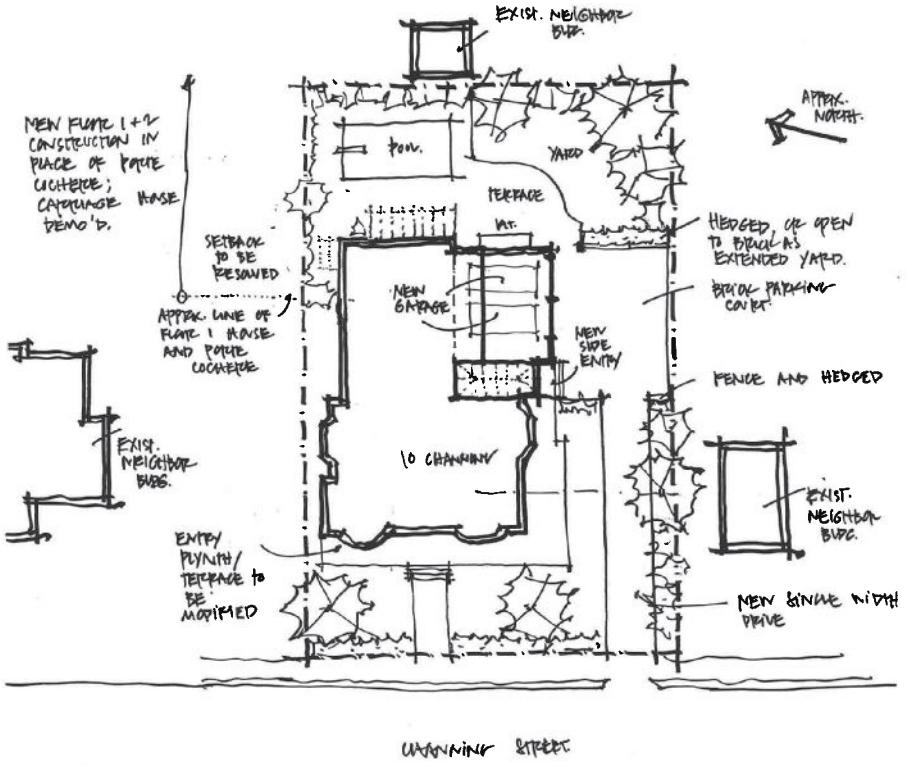
"The mantra in the market is if you build it, it will sell," she says.

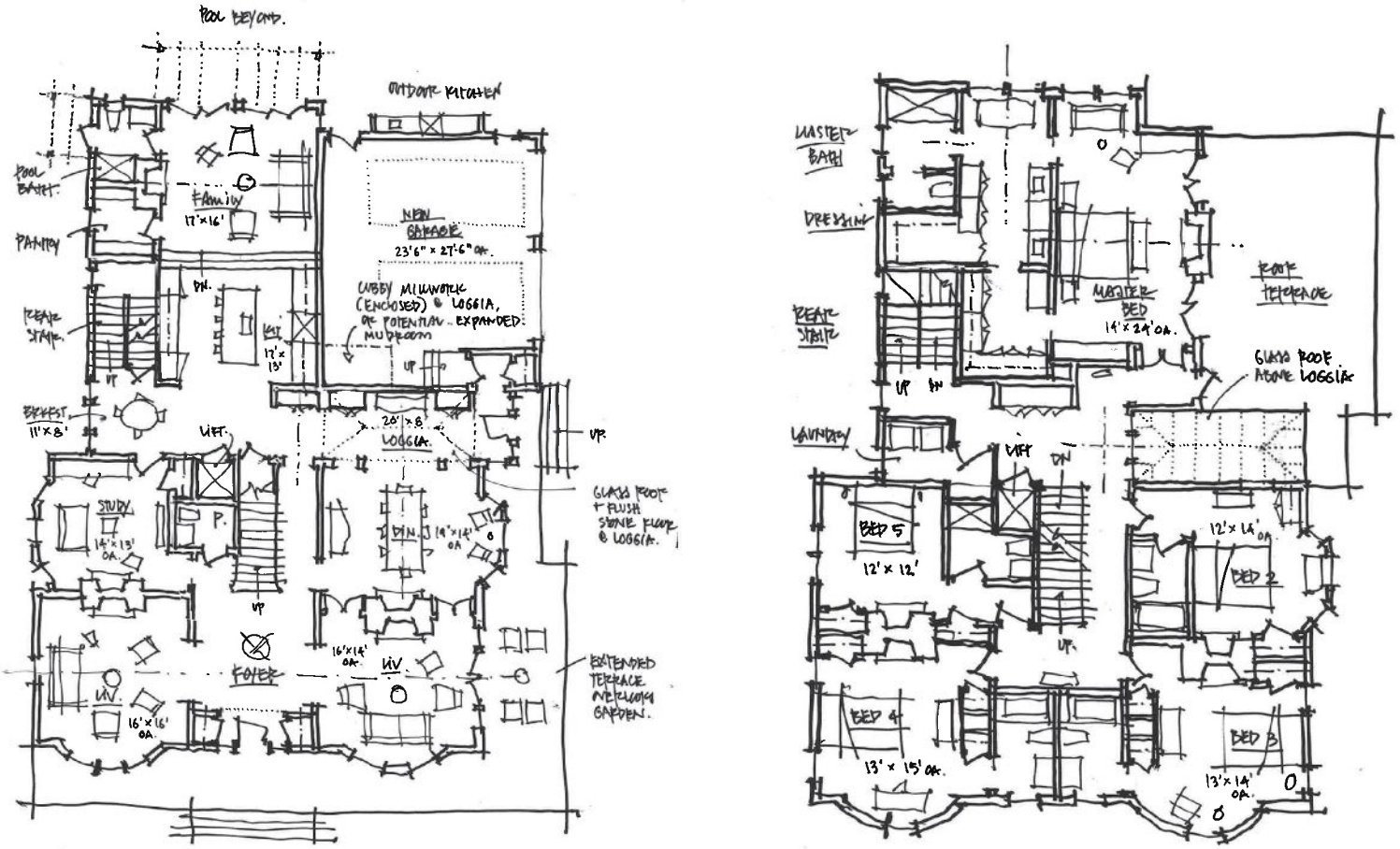
This frenzy of activity and demand is prompting consumers and builders to figure out how to design and build homes that maximize functionality, says Mikaela Sharp, manager of trends and innovation at John Burns Real Estate Consulting.

"Builders were focusing on what they thought worked, and when COVID hit and the industry began realizing that people would be changed by this, it sparked a renaissance in research," she says. "It's not as much about how much consumers will change, it's also that big builders are paying more attention. It's amazing how much people just want a functional space after being locked inside."

The COVID home and remodeling boom didn't occur in a vacuum. The pandemic only served to hasten existing trends in real estate. Pre-2020, a strong demographic shift already supported increased homebuying and investment, says Alexander Hermann, a senior research analyst for the Harvard Joint Center for Housing Studies (JCHS). Millennials are aging into their prime homebuying years, but record-low interest rates and wealth inequality are also factors. The high-income

Sketches from a single-family home renovation project by Boston's CBT Architects show how the plan evolved over time.





CREDIT: CBT ARCHITECTS

groups who can afford today's high real estate prices tended to escape many of this year's layoffs and benefited from the stock market gains, what Hale calls a "tale of two markets."

The result is that an economically mobile segment of society, often in the early years of raising a family and crammed inside for months, is dreaming of more space and is enticed by the best mortgage deals in history.

While the overhyped "cities are over" storyline has proven false, it's still true that suburbs and smaller and mid-size metros have seen big growth due to this pent-up demand, according to NAHB's Dietz, with medium-density developments getting more attention from builders. He foresees a rising desire for urban infill and smaller multifamily projects over the next two to three years.

"Traditional growth centers like Tampa, Dallas, Houston, and Austin will benefit, but give Kansas City or Columbus, Ohio, a second look," he says. "Whether it's new construction or remodeling, there's a lot to make from this increased demand for space."

The Realtor.com forecast for next year's hottest markets, which are collectively expected to see a 6.9% price increase and a 13.1% year-over-year jump in total sales, also points towards a continuation of a long-term shift towards smaller cities. The list—Sacramento, Calif., San Jose, Calif., Charlotte, N.C., Boise, Idaho, Seattle, Phoenix, Harrisburg, Pa., Oxnard, Calif., Denver, and Riverside, Calif.—consists of burgeoning Sunbelt metros, mid-size up-and-comers, and western cities providing alternatives to places like Los Angeles and San Francisco.

Second-home markets have also seen booms in sales and remodeling during the pandemic. According to Nilay Oza, AIA, principal of East Hampton, N.Y.-based architecture firm Oza Sabbeth, COVID-19 has brought in a significant number of new clients, from small remodels to new $4 million homes. Many have asked how to make their summer homes more robust for year-round living.

"In the grand scheme of things, COVID has made remote presence more acceptable," he says. "Those who lived here 100 days a year before now tell us they want to up that to 180 days. They're looking for a split lifestyle, clearly more than just weekends and summers."

Though this year has already seen significant shifts in the markets, experts at John Burns believe the real boost in remodeling activity is yet to come. While homeowners were busy with renovations this year, resulting in double-digit spending increases, Tomalak says many were small-scale, often focused on the outside and typically around or under $1,500. In surveys with homeowners, he found many big-ticket updates, such as kitchens and bathrooms, have been put off, not canceled, and beginning in 2021, especially as a vaccine gets distributed, will proceed.

"Big project spending is historically correlated with design-build and remodel firms, the kind of blue-chip remodel shops that take your entire house and, with an in-house architect and designer, transform it," he says. "That's who should benefit."

The theme of those upgrades and renovations will often be functionality. Even when workers return to the office, there's a sense that work-from-home will persist in some form. Ellen Perko, AIA, associate principal and residential specialist at Boston-based CBT Architects, says that the main desire from clients is to rework space strategically. Open-plan homes, lacking flexibility and privacy, haven't worked during the pandemic; homeowners want rooms that can double as offices and places to focus; entryways and mudrooms that provide clear breaks between the indoors and outdoors; and private outdoor space.

"The creation of an oasis is key," Perko says. "People are thinking strategically about space for their families and how they can support their lifestyles."

As Hermann at JCHS points out, it's not necessarily about more square footage as much as it is about designing better and more usable space. Houses are already plenty big: From 1989 to 2015, the share of new single-family homes with four or more bedrooms rose from 28% to 47%, and in 2019, the average home was 2,300 square feet, up 24% from 30 years prior. Studies have found that 61% of households with five or fewer members have one or even two extra bedrooms. But those layouts haven't been optimally designed for the challenges that have cropped up in the last year or for the future changes coming to work and consumer lifestyles.

That's especially important for architects to consider, especially as we start to reach the pandemic's end. What many Americans want out of their homes has changed. "Desires become needs," says Perko, and the next phase of home design will be dominated by those who can incorporate the need for flexibility, privacy, and usable space into more affordable and attainable homes. The predicted boom in remodeling signals a desire for change, as Tomalak points out, as well as burgeoning opportunities for an industry that nearly a year ago may have thought the market was shutting down.

"You don't write a six-figure check for a remodel if you're not dissatisfied with your home," he says. "That should be a big signal to builders and designers and architects." AIA

AIA PERSPECTIVE

Lighting the Path

Architecture's pathways to the profession are our legacy and our responsibility.

By Peter Exley, FAIA, 2021 AIA President

Last month, Kamala Harris became the first Howard University graduate to be sworn in as vice president of the United States. Her inauguration is the fulfillment of a career in public service and signifies a series of firsts beyond Howard for the nation. Her inauguration is also the symbol of possibility for millions of young women who have similar aspirations for achievement in public service, on their own behalf and on behalf of the people they might serve in law, governance, science, administration, or design. Vice President Harris shattered a ceiling that few believed could be shattered even a generation ago. Admittedly, being a living symbol of possibility for women of color is the heaviest crown of all, but she has accepted this challenge.

Last year, AIA participated in the NAACP 2020 Diversity & Opportunity Report Card to examine our operations and identify opportunities for progress. This process included reviewing AIA Honors and Awards procedures, as well as our Fellowship program, to inform actions to ensure greater diversity in those we recognize for professional achievements. We've developed a new initiative called Future Forward to help support our progress. The Future Forward page at aia.org provides educational resources to enhance understanding and engagement.

As slow as progress toward equity has seemed, AIA's resolve has never been stronger. That resolve centers, in part, on resources like our Guides for Equitable Practice. Developed over the past two years in partnership with Renée Cheng, FAIA, dean of the University of Washington's College of Built Environments, the guides include case studies and tactical advice to, as Cheng says, "convert intentions into actions." They are a valuable tool as we work to identify and dismantle our implicit and explicit biases. At this moment, this is one of the finest road maps we have for ensuring that our practices are relevant and adhering to best practices. Not convenient and minimum standards, but standards that are dignified and an exemplar for all professions.

Barriers to diversity in our profession start early—not just in college, but even at the elementary school level. Education and scholarship initiatives are critical. As the future of the profession, your voices, insights, and contributions are especially valuable. Pathways to the profession are everything. Yes, architecture will always have a critical and relatively stable mass of professionals as long as we do what we've always done in advocacy, continuing education, licensure, and long-term support. But, if we want architecture's pathways to embody the vitality of diverse perspectives and experiences, then we must address the entire journey.

We need your commitment to this future. We need a lot of help. Carina Mills, AIA, of AIA Long Beach/South Bay, Calif., told me about high school teacher Jeffrey Jackson who has created a conduit between Wilson High School and Cal Poly and SciARC, giving kids in at-risk neighborhoods access to our profession's benchmark institutions. By heightening familiarity in schools about what an architect does, Jackson and AIA Long Beach/South Bay are contributing to a more equitable and diverse profession, which is critical to innovative thinking and problem solving.

AIA has a number of innovative K-12 resources to cultivate that same familiarity with our profession in young students. One of them is the Build the Block tablet game (available via every AIA component), which pairs architects and teenagers to plan for all the things a community needs to thrive.

AIA's broader K-12 initiative features lesson guides for educators that address state-level standards and relate to the Framework for Design Excellence, which was published last year. Partnering with organizations like the National Education Association or the National Science Foundation might also be a gateway to facilitate this initiative and its multiyear work to demonstrate engagement, awareness, and collaboration. This is the time to redouble our focus on these resources and on scholarship initiatives to support college education, not to mention grants to support early professional development.

The NEA awarded Kamala Harris an "A" grade for her focus, as a first-term senator, on supporting educators and bolstering schools. As a vice presidential candidate, she ran on an education platform with President Biden that centered on K-12 funding, racial justice and equity, and accessibility to college. In short, she ran on bolstering pathways to the profession. Nothing could be more important as we celebrate Black History Month than forging new opportunities for people of color at every age in every economic quintile across the nation. AIA

CREDIT: RUTH YARO

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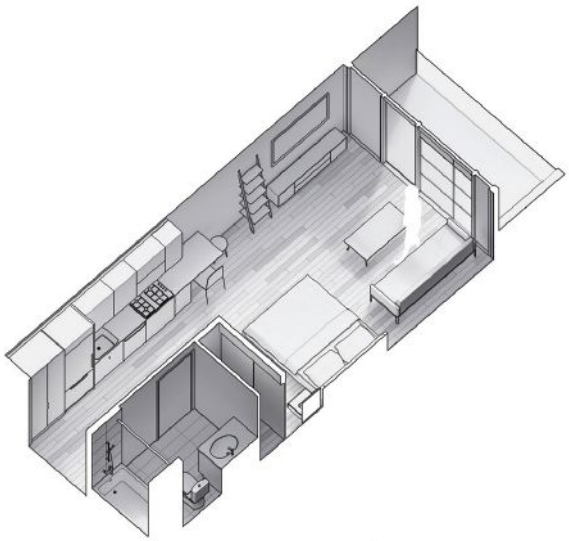
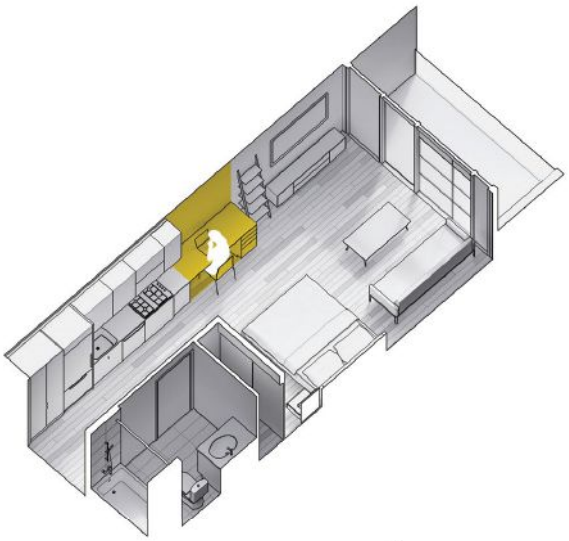
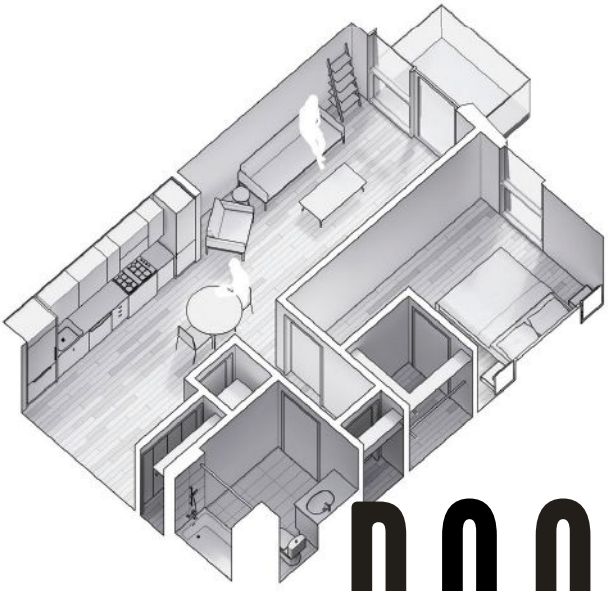
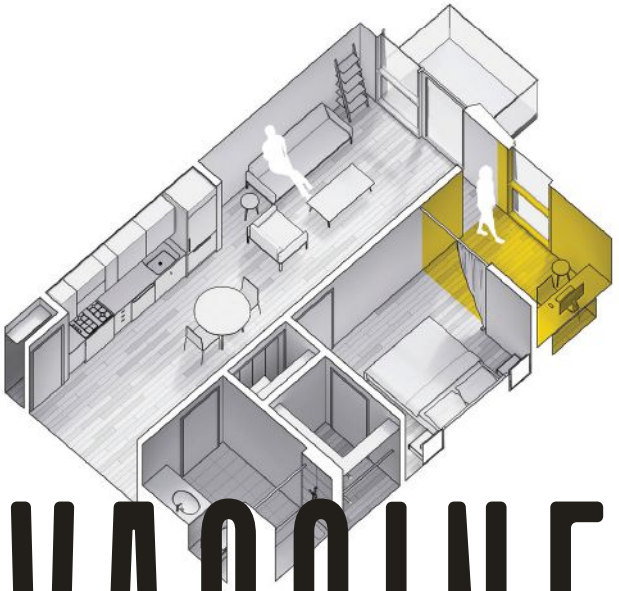
ARCHITECT



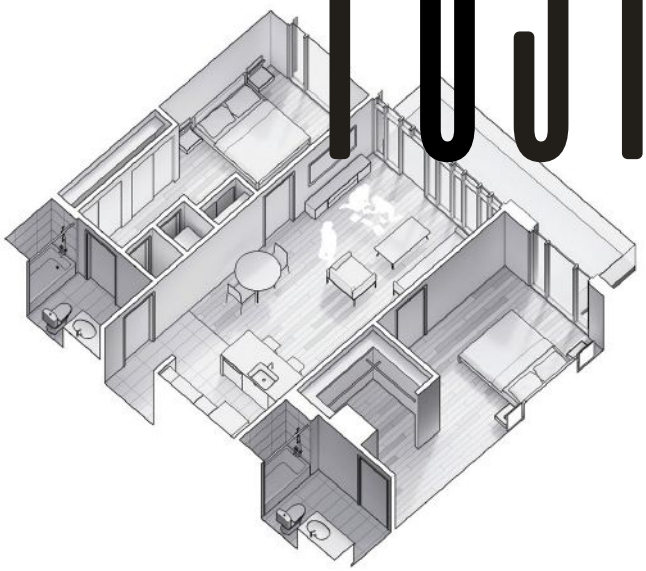


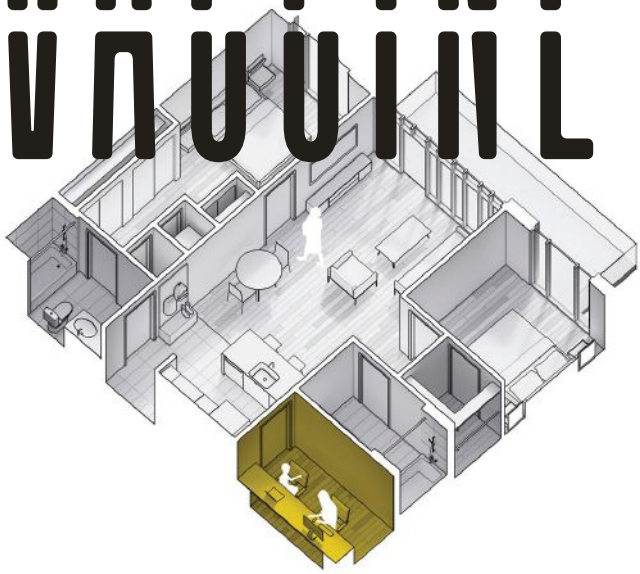


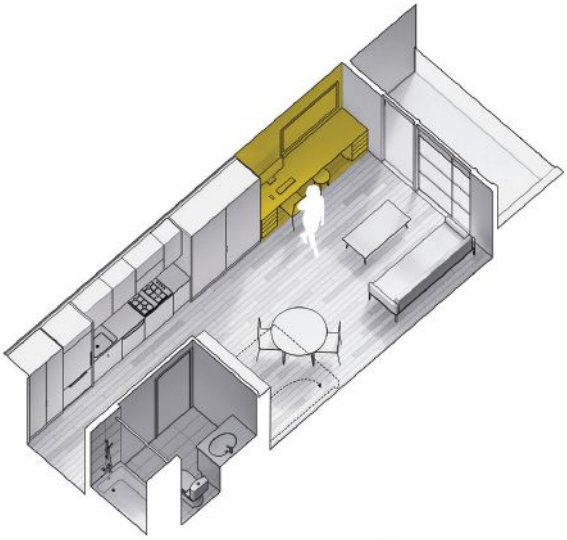


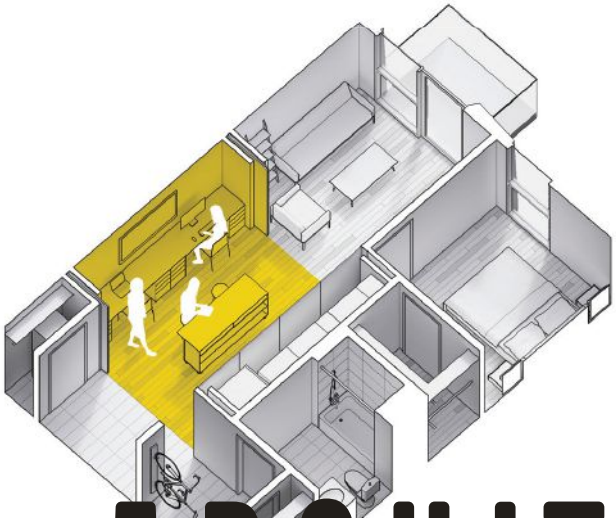
POST-WARNING

WHAT'S NEXT









ARCHITECTURE AFTER THE PANDEMIC

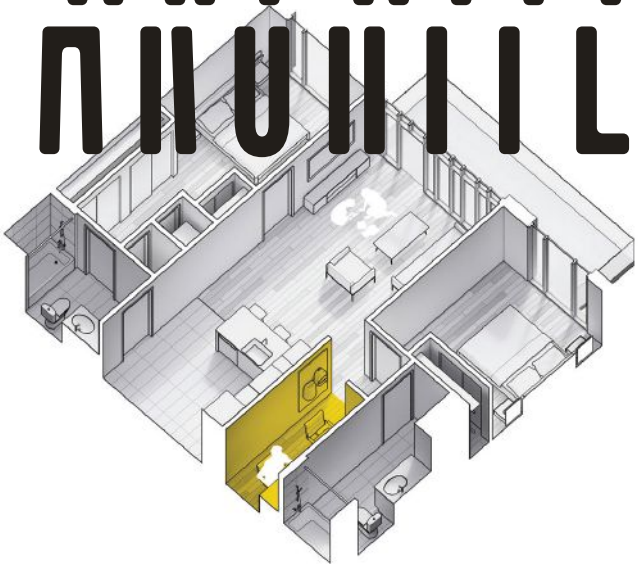
TEXT BY GIDEON FINK SHAPIRO
EDITED BY WANDA LAU

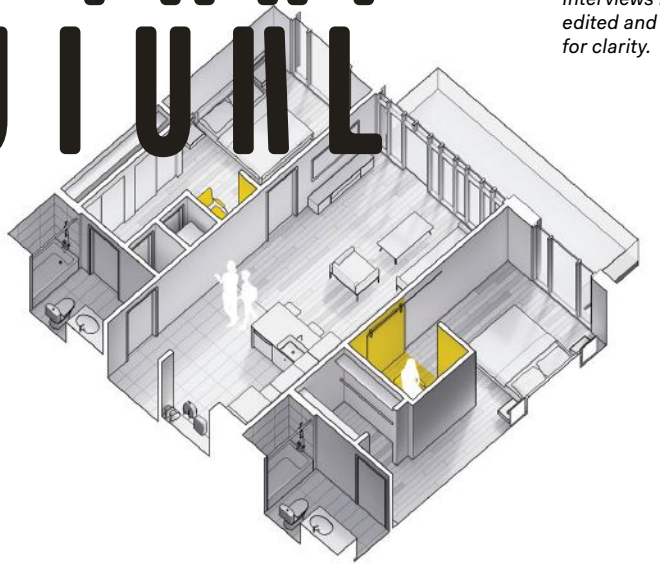
What's next? A year ago, the answer that no one foresaw would be "a pandemic." Though the COVID-19 pandemic will end, architecture cannot—and will not—simply return to its old habits and forms. The global health emergency has changed how we live, travel, and work. It has altered how we use and navigate space, what we expect regarding safety and sanitation, and the way we greet strangers and loved ones. Within the design profession, the pandemic has upended workflows and challenged architect-client rapport.

Some of these changes, like lingering side effects, will outlast the pandemic itself. But while the ground is still shifting, the future is ripe for rethinking. What will smart, safe, and beautiful design look like in a post-vaccine, post-pandemic world? And how can architects meet changing demands in an altered professional landscape that has yet to recover from the recession? Through the kaleidoscope of contingencies and unknowns, firms are listening to their clients, users, and staff more closely than ever. They're asking new questions and they're getting creative.

As the improvised solutions of last year give way to more permanent design responses, leading architects in five key building sectors—multifamily residential, corporate, K–12 education, health care, and cultural—share how they are positioning their practices to take on the emerging challenges and opportunities.

> *Read Gideon Fink Shapiro's interview with The Lunz Group principal Mike Murphey, AIA, and director of marketing Maggie Briggs on post-vaccine industrial architecture, along with the full Q+As for all featured typologies, at bit.ly/ARpostvac. Interviews have been edited and condensed for clarity.*





WHAT'S NEXT

POST-VACCINE MULTIFAMILY ARCHITECTURE

DON'T FORGET THE FUN IN FUNCTIONALITY

Kate Campbell
Director of Business Development
HKS
Washington, D.C.

If working from home is here to stay, how will apartment layouts accommodate that?

We're looking at flexible unit design, access to balconies and other outdoor spaces, and how spaces make people feel from morning to afternoon and evening. Working at home can get monotonous. Your dining table can't be everything.

How do you design for that flexibility?

Sliding doors and screens are multifunctional—you can have views instead of doors everywhere. You can screen off the kitchen when you're working. It's like a reverse Murphy office where you slide the partitions open or closed. The problem with most home offices and dens in a tight layout is that they don't get daylight. We have developed options for a bedroom office where, instead of a wall, a curtain screens off a work area so you have access to sunlight and privacy.

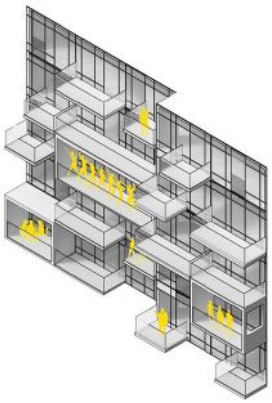
How will the pandemic affect the "amenity wars," in which developers vie to provide the most attractive shared spaces?

We've been talking about ways to create community within a mixed-use environment or a multifamily environment by dispersing the amenities. For example, instead of one roof deck, you have a series of smaller roof decks. Each floor could have a swing space, for hosting a meeting or dinner party, or even just for privacy. These dispersed or distributed amenity spaces aren't new, but [pre-pandemic] they had fallen away in favor of big, massive amenities. In a pandemic world, the distributed spaces are safer because they can be

reserved for personal or small-group use. And because they're on each floor, you don't have to take the stairs or elevator to reach them. They're cleaned and maintained by the building, and they can be rented as an additional source of income for the developer.

What about multiple entrances so people can avoid concentrating together?

Multiple entries can be appropriate, particularly for larger buildings. It could mean having several smaller lobbies. I've certainly walked through large buildings or hotels where I've gotten lost or felt like I couldn't get out. So in the long run, it may be nicer, not just safer.



How will you balance the need for isolation and the desire for open space and community?

That's the trickiest thing. We've always done a good job of providing outdoor and amenity spaces. Now the question is, "How quickly can you get access to it?" You can be safe in your own space, and we can upgrade all the HVAC systems. But if you have to go down a long corridor to take an elevator and then a penthouse elevator to reach the roof garden, it's not ideal. In addition to rooftop access, we may need individual balconies and a dog run or a community garden right outside. Residents should have many opportunities to enjoy the outdoors.

What's an example of a current HKS project that offers a variety of outdoor spaces?

We're working on a residential tower at 5600 Hollywood Blvd., Los Angeles. It is designed with stepping terraces so every resident has access to a localized outdoor gathering place, because the site doesn't allow for a garden on the ground.

Are you working on affordable housing developments?

In Richmond, Va., we have a Citizen HKS (the firm's social impact initiative) project, The Benefield Building, which is 100% affordable. Working with the nonprofit Boaz & Ruth, we engaged the community in the design process. Good design isn't just for the wealthy. Mixed-income development is another great route for building community and equity. If the developer can make the financing work without separating the affordable from the market-rate units, then everybody seems to do better.

What's the next big idea in multifamily residential architecture and planning?

Co-living is a big deal, especially with the rise of remote work. In a post-pandemic world, a lot of professionals, if they don't have kids, will take the opportunity to live somewhere new for a few months in a co-living scenario. Because it's not an Airbnb, it's a community. It's an actual apartment building with a coworking office. It's not going to be effective for everybody, but some of the same layout elements and distributed amenities will also work for regular multifamily housing.

Retrofits are having a moment. Are clients coming to you about redeveloping certain types of spaces?

Absolutely. There is market demand. Some office buildings are turning into multifamily, coworking, and co-living spaces; we're retrofitting and updating a series of garden apartment complexes. We're researching the right layouts and the right amenities to fit the building and the market. Many older apartment buildings have one line of units—the same unit on each floor—that isn't that great; it doesn't lay out well and almost feels like leftover space. Those units would be converted into dispersed amenity space. You take that unit away, but you give amenity space to that floor.

Have you noticed any shifts in program in terms of retail tenants?

Access to health care in the building, like a CVS Minute, is now seen almost as another type of amenity. And we're looking at putting Amazon distribution centers in some projects. It brings in revenue for the developer, but it doesn't tax the building staff because it's separate.

You've talked about balconies as quasi-social spaces, where you could wave to your neighbors. How would that work?

A balcony is your private space, but it could also be a social connector. I love balconies—once you live with one, you can never go back. Usually they're stacked on top of each other, so you never have any relationship with your neighbors. But that great video of the Italians singing from their windows and balconies during the early days of the pandemic got us thinking of different ways to stack or configure balconies—not only to help articulate the building facade, but also to create these pleasing spaces where you could sit, have a cup of coffee, and have a friendly moment with a neighbor. Ideally the balconies are not right next to each other, so you're not staring at someone, but they're syncopated throughout the building. You could talk up or down to somebody. And you can have screens to create more privacy.

Previous spread: Apartment layouts exploring different live–work spaces by HKS

Above: HKS balcony diversity study showing a mixture of uses, including individual live–work and event spaces

Left: Residential tower design for 5600 Hollywood Blvd., Los Angeles, by HKS

WHAT'S NEXT

POST-VACCINE CORPORATE ARCHITECTURE

ANTICIPATE AND ACCOMMODATE HYBRID WORK MODELS

Most Important Reasons to Come to an Office*

Scheduled meetings with colleagues	54%
Socializing with colleagues	54%
Impromptu face-to-face interaction	54%
To be part of the community	45%
Access to technology	44%
To focus on individual work	40%
Scheduled meetings with clients	40%
Professional development/coaching	33%
Access to amenities	29%

Janet Pogue McLaurin, AIA
Global Workplace Research Leader and Principal
Gensler
Washington, D.C.

How is office design evolving?

Prior to the pandemic, office design had become more open and very dense, and unassigned seating was on the rise. When Gensler released our annual U.S. Workplace Survey in January 2020, we saw workplace effectiveness drop for the first time since we began measuring it in 2008. And those in unassigned seating were struggling the most.

What is the antidote to excessively open offices?

Pogue McLaurin: People want choice and variety. Pre-pandemic, employers were giving them that choice and variety from 9 a.m. to 5 p.m. on weekdays at the office. Home was not a part of the choice offering. When the pandemic hit, we all proved that individual focus work can be productive from home. In Gensler's survey of office workers last summer, people reported that they still preferred going to the office for group work, for collaborating, for socializing with their colleagues, and for being part of a community. When we conducted another survey in the fall, office workers increasingly preferred a new hybrid work model. They wanted the ability to alternate between working remotely, whether from home or somewhere else, and working at the office.

How do you translate a hybrid work model into design strategies?

Pogue McLaurin: We need to understand first how individuals and teams work best, and then we can script an experience around each of them. It starts with asking the right questions. How do they work throughout the day? When do they need quiet focus and how do they collaborate? Where do you want to bring different teams together to connect ideas? How do you engage with visitors and guests?

and

Joseph Joseph, ASSOC. AIA
Global Director of Design Technology and Principal
Gensler
Los Angeles

Technology is part of our strategy as well. Two years ago, when the industry was hyperfocused on automation, we focused instead on developing our design tools, processes, platforms, and intellectual property to give our designers and our clients the ability to visualize options and solutions based on data.

100% *according to 2,300-plus survey respondents

When you think about the future of user experience in the workplace, who are the users, what spaces, furniture, and devices are they using, and what is their experience?

Pogue McLaurin: The longer we work from home, the more the role of the workplace becomes bringing people together in intentional ways. We're starting to think about user experience from the perspectives of both individuals and teams. There may be different levels of workplace mobility and choice. Some employees may come in five days a week, others only five days a month or five days a year. The office experience can be different for teams that need to have an extended stay versus teams that come together sporadically. To make workplaces more flexible and responsive, we are exploring new ways to zone floors differently and to specify or design furniture that people can pull together or push apart to work as a team or independently.

Are clients looking for different things from you now than they were before the pandemic?

Pogue McLaurin: Workplace design is not only about efficiency and how many people we can fit in a space. Companies are asking, "How do we attract and leverage our people? How do we help motivate and connect them?" Those soft issues, the intangibles, are the hardest to design. We are now working directly with human resources officers, not only facility and corporate real estate managers. In this far-flung and virtual world, we can use the physical workplace as a tangible asset to bring everybody back together.

Joseph: Employers, investors, facility managers, and developers are asking, "What differentiates us?" Our job, as designers, is to curate a "wow" experience to attract employees and tenants, to position our clients for success when the pandemic is over.

How will smart building systems and apps affect the work environment?

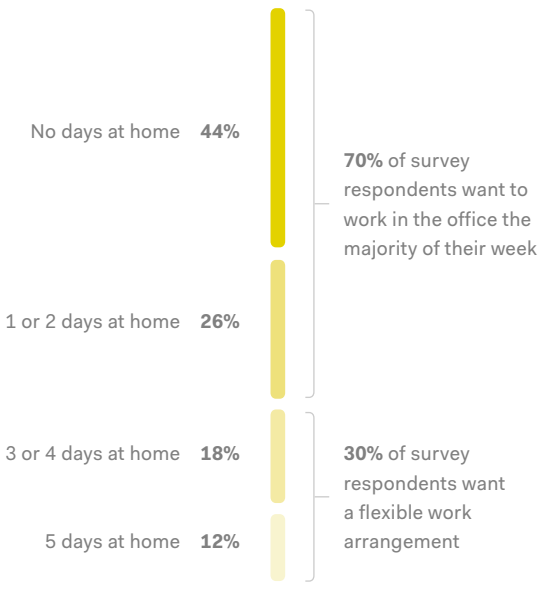
Pogue McLaurin: The pandemic has accelerated the development of touchless environments and the responsiveness of building technologies. We're not far from being able to walk up to a building that scans your eyes and clears you through security. Based on your calendar, elevators will know what floor to take you to, and you'll arrive without touching a button. Occupancy sensors will allow us to respond to users' needs in real time, as well as monitor energy usage. We already have apps that allow us to order lunch, access building or neighborhood amenities, and reserve conference rooms.

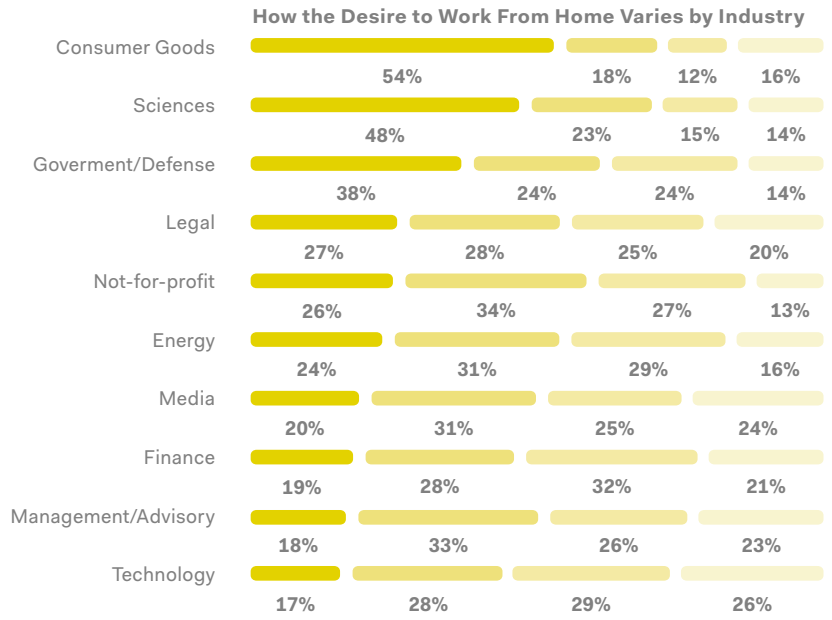
Do you anticipate a greater emphasis on renovations and retrofits in the coming years?

Pogue McLaurin: Absolutely, because developers need to increase the value of their portfolios. And from a resilience standpoint, we need to explore repurposing existing buildings, before automatically assuming we need to design a new one. We also see renovations and retrofits as a huge opportunity for architects to create more equitable and more resilient communities.

Will the need to upgrade air handling systems affect your design strategy in any way?

Pogue McLaurin: This is a rapidly developing area where more research and testing is required. We're exploring whether creating smaller zones to condition and purify the air is more effective than allowing air to move across an entire floor plate. That also ties into how we're thinking about team spaces, since smaller zones can help define work areas and help with acoustics. So we're looking at ventilation as a holistic framework of health and other factors. Wouldn't it be amazing if everyone left the office feeling healthier at the end of the day?





SOURCE: GENSLER RESEARCH INSTITUTE U.S. WORK FROM HOME SURVEY 2020; GENSLER U.S. WORKPLACE SURVEY SUMMER/FALL 2020

WHAT'S NEXT

POST-VACCINE K-12 EDUCATION ARCHITECTURE

BUILD ON STUDENTS' STRENGTHS

Prakash Nair, AIA
Founding President and CEO
Education Design International
Lutz, Fla.

How has the pandemic affected K–12 design, and do you expect to see any lasting impact post-vaccine?

The primacy of the classroom has come into question because of the pandemic. That is a good thing because classrooms are not effective places for learning. My hope is that even if we aren't going to get out of the classroom altogether, schools will resist the temptation to return to the teacher-directed model of education for which the traditional classroom is best suited.

What's the matter with classrooms?

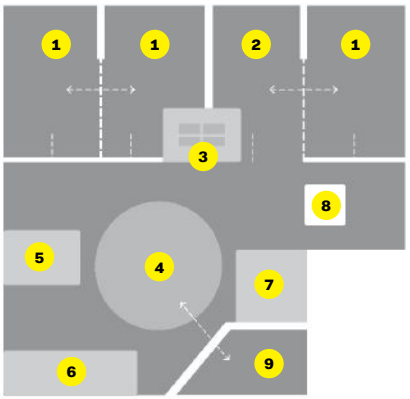
Classrooms are ideal for synchronous teaching—a place where teachers and students are required to be at the same time. Now with online learning thrown into the mix, I hope there will be more development of asynchronous models where teachers and students can connect spontaneously as needed. Asynchronous models are also being tried out in physical settings. Schools can still be valuable places, but only if they reinvent themselves. They can become places that we want to go to because we can do things there that we can't do at home.

What activities can happen only at school?

Schools can offer access to specialized technology such as laser cutters or 3D printers. Most of the problems in today's world have to be solved by communities of people. Schools can become research centers where people are learning to put their heads together for creative and practical problem-solving. And, of course, there's a social aspect to it. The school environment can help students cultivate social and emotional intelligence.

Anne Frank Inspire Academy, a public charter school in San Antonio master planned and designed by EDI

Learning Community Corridorless Floor Plan



1. Learning studio
2. Quiet commons
3. Teacher collaboration studio
4. Commons (presentation and project area)
5. Media bar
6. Wet and messy area
7. Small group
8. Breakout
9. Outdoor project area

How do you design for user experience to reflect that vision of education?

In the case of schools, the clients are usually bureaucracies or administrators, so the ultimate end users—teachers and students—too often have not had the architect's full attention. The result is that students are held prisoner in uncomfortable, small rooms for hours on end and under the watchful eye of adult wardens—what teachers unfortunately have become in the traditional model. The pandemic experience for most children has not been much better because they are now being fed, by computer, the same one-size-fits-all user experience. But some schools have seen stay-at-home mandates as an opportunity to make the remote learning experience more personally fulfilling, interesting, and rewarding. The big question is whether schools will move toward a more child-centered, more humane model. That is the future.

When students are allowed to return to school in full numbers without masks, how would you like to see schools transform?

I'm hoping that whatever we do with the physical place called school matches our expectations of what we want our students to become. We need to cultivate thinking individuals through an interdisciplinary approach to education. When you have science, math, and social studies happening in different classrooms, disconnected from each other, you're not allowing students to think holistically about the world and its interconnected problems. A different education system requires a different curriculum and, by extension, a different learning environment.

The pandemic has highlighted and exacerbated racial and social disparities. How can post-vaccine education design promote greater equity and opportunity?

School design has always penalized marginalized and underserved populations who, in many cases, happen to be racial minorities. Children come to school with very different needs. I agree with the personalized, student-centered model advocated by Yvette Jackson in her book *The Pedagogy of Confidence* (Teachers College Press, 2011). We can break down the classroom walls to create a variety of small, medium, and large spaces that are differentiated, furnished, and equipped to facilitate a wide variety of learning modalities tailored to the needs of each individual learner. That's the only way we're going to be able to start dealing with those inequities.

Can you convert a traditional school building relatively inexpensively into a more dynamic learning community?

Given that we have about $2 trillion or more invested in our physical school buildings, we can't throw them away. The good news is that most of the traditional "cells and bells" school buildings—basically classrooms with corridors—are column-and-beam structures. So the vast majority of the infill walls are nonstructural. By taking down some of those interior walls, you can rethink the architectural layout without huge expenditures. Over the course of a summer, we can quite easily convert a traditional school into a learning-community school that meets the learning needs of today's children. The main barrier is not financial; it's having wider agreement that this kind of change is a good thing.

Are you anticipating a school construction boom post-pandemic?

Demand has been suppressed by the pandemic and that might result in a mini boom in the school-building business later. While that may be good for architects and contractors, I don't know how good it is for kids. It's time to think about education as a responsibility that is shared by the whole community, including businesses, cultural organizations, professional entities, higher education, and industrial institutions.

We have many facilities that lie vacant during the school day, like the YMCA, public parks, and museums. If education is not bound by the physical place that we call school, then it can become a much richer experience. By using wider community resources as extensions of school, we can construct fewer new facilities. The business opportunity for the school-building industry is the renovation of existing school buildings to make them more compatible with today's needs.

WHAT'S NEXT

POST-VACCINE HEALTH CARE ARCHITECTURE

MAKE EQUITY A PRIORITY TO HELP SAVE LIVES

COVID-19 Deaths per 100,000 People by Race or Ethnicity

Black or African American	144
American Indian or Alaska Native	134
Hispanic or Latino	116
White	94
Native Hawaiian and Pacific Islander	93
Other	79
Asian	70
Two or more races	13

Roderic Walton, AIA Associate Principal Moody Nolan Chicago

I understand you focus on improving equity in health care design.

Moody Nolan designs a considerable number of projects for health care institutions and universities. Most of our Chicago-based health care projects are for communities of color in underserved parts of the city, on the South Side. Our core focus has been on overcoming disparity in health care.

How has the pandemic informed your vision for health care architecture and planning, now and post-vaccine?

The pandemic has exposed significant disparities in health care and health outcomes, which are often driven by social determinants of health. We often use data to analyze a person's social determinants and predict what level of health care service they will receive and what their outcome will be. Data from sources such as the COVID Tracking Project show that Black Americans are dying from COVID at 1.5 times the rate of white Americans. When a person has two "comorbidities," or coexisting conditions such as obesity and heart disease, they are more vulnerable to COVID. Vaccines will help curb the pandemic, but they're not going to resolve the underlying socioeconomic factors that are driving those disparities.

East elevation, Friend Family Health Center in Chicago, designed by Moody Nolan

What reforms could help level those disparities?

One thing architects can do is prioritize preventative health care and health care education. We can work with our clients and partners to build those solutions into our programming process in order to advocate for patients who need those services. One way to think of it is that the community is the health care system. If you have housing that's not equitable, or if you live in a food desert, or if you don't have access to preventive care, your community health system is broken. So, we have to invest in all of those services.

How do your projects include broader notions of community health?

For a community-based health care center in the heart of Chicago's South Side, we are building on a population health model and integrating a healthy food-service offering into the facility and expanding the patient experience beyond their doctor's appointment or visit. Nearby is the Mile Square Health Center, an extension of the University of Illinois Hospital system. Early in the design process, I realized that the facility had to be near public transportation. We also discussed outreach strategies to make sure that the infrastructure was in place to assist with the scheduling of appointments and follow-up appointments.

Most importantly, our design meetings were focused not just on the center itself, but on empowering the entire neighborhood. Community-based health care starts with having a lot of empathy and compassion rooted in an understanding of history.

That's inspiring. How does health care architecture intersect with the history of racism?

Housing segregation is one of the primary factors that drives social determinants of health. Because many communities of color in Chicago are geographically isolated due to redlining, we don't have good access to care. We're not getting regular exams—people encounter the health care system only when they feel sick. Often that's too late. We're missing that whole preventative-health-care apparatus.

We can look at the history of housing segregation, redlining, disinvestment, and zoning restrictions and try to program spaces to mitigate some of those disparities. That's an important step toward increasing the level of sensitivity toward marginalized patients and the type of care that they expect and deserve.

Does your work or your impact extend beyond the walls of the facilities you design?

As health care architects, we're in a unique position to advocate for change. We often partner with clients who are decision-makers for their institutions. If we can make a case based on research and data, clients are often responsive to our view of community health. Beyond that, many health care architects are involved with committees and organizations that can inform policy decisions and address racial disparities.

Hospitals had to quickly reconfigure to handle surging COVID-19 cases. How will you help them prepare for future challenges?

Adaptability and flexibility are paramount in health care design. Space is finite and often the services may need to perform more than one function. For example, we've seen hospitals install medical gas systems and data ports into columns in their lobbies so they can repurpose that space if they have a surge. Airflow systems can be reversed from negative to positive pressure to isolate different areas. When Moody Nolan designed the Adult Level 1 Emergency Department for University of Chicago Medicine, we looked at a solution to allow the ambulance bay to serve a second purpose as a decontamination facility.

What's the next big idea in health care architecture and planning?

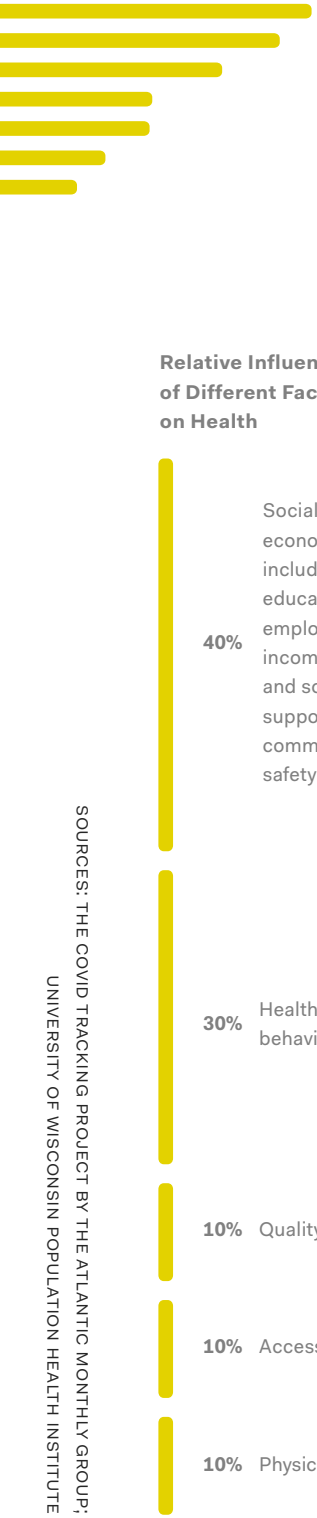
Health care equity should receive the same emphasis as safety. Collectively we need to commit to strategies that acknowledge disparities rooted in history, and our process should strive to overcome those disparities. Just as safety is a fundamental part of the health care architect's toolkit, and just as health care systems maintain protocols to evaluate and ensure the safety of their environment, we should create robust tools to promote and measure equity over the life cycle of a project or a building. We can work with our clients and partners to make equity a priority. And together we can transform the industry.

Are you shifting any business models or operations in preparation for a potential post-vaccine building boom in the health care sector?

We're trying to figure this out. For now, we're trying to learn and share as much information as we can about what the permanent implications of COVID-19 are going to be, both in terms of future design standards and from a policy perspective.

Our clients turn to us as trusted advisers. They expect us to be able to share information that will help them make the best business case for their future and position their providers, staff, and patients to respond to the next pandemic. In order to do that, we have to be armed with as much information as we can to continue to study, learn, and be prepared to adapt.

Relative Influence of Different Factors on Health



SOURCES: THE COVID TRACKING PROJECT BY THE ATLANTIC MONTHLY GROUP; UNIVERSITY OF WISCONSIN POPULATION HEALTH INSTITUTE

WHAT'S NEXT

POST-VACCINE CULTURAL ARCHITECTURE

GIVE THE ARTS ROOM TO BREATHE

Marion Weiss, FAIA and Michael Manfredi, FAIA Principals Weiss/Manfredi New York, N.Y.

How has the pandemic affected your outlook on cultural and public space projects?

More than ever, it's important for cultural and outdoor spaces to welcome serendipitous gathering and performance, but also to provide a sense of calm and retreat. It's important to give the arts room to breathe.

"Room to breathe" is a notable choice of words. Are you referring to the importance of fresh air, or a general sense of opening up?

Weiss: Both. Too often, cultural institutions have been viewed as gated communities. Now is truly a moment to open up and invite all communities in. The transparency of arts institutions and the ventilation of the arts with open space are both essential. Connecting the worlds of the outdoors and the indoors, and art with ecology and urban life, benefits all when they have reciprocity rather than clear divisions. When we designed the Hunter's Point South Waterfront Park in New York, we saw it as a connector of this new affordable housing community with the fluctuating tides of the East River. Even flooding was seen as a gift to the identity of the place.

The idea of giving art room to breathe quite literally happened at Olympic Sculpture Park. The Seattle Art Museum decided to keep the park open during COVID-19, and the park became a sanctuary for folks who couldn't afford to flee the city.

Another example is the La Brea Tar Pits master plan, which we started just before the pandemic. The tar pits, park, and museum are about the Pleistocene, which holds great lessons in terms of climate warming and the cycles of environmental disaster. And because the site includes open space, we're starting to think how the museum will operate in a post-COVID environment where fresh air is crucial.

How do you advocate for fabulous cultural and public spaces when institutions and governments are cutting costs?

Weiss: When budgets are tight, people might think that they can't focus on design. In fact, that's the very moment to talk to architects who focus on design and think strategically about how to create gathering places that are incredibly robust. We don't think there's a discrepancy between high ambitions and modest budgets. It's modest dreams that constrain you.

Manfredi: In this moment of global, psychological, and physical stress, beauty has to be woven into the metrics of what makes open space successful. It's crucial to our well-being.

How do you get to know your users?

Manfredi: Institutions often have an idea of who their audience is, but as architects, we can only imagine who will inhabit our spaces 10, 20, or 50 years from now. So we design spaces that have lasting value and a sense of poetry to engage audiences after we're gone.

Weiss: You look at the ancient Greek amphitheaters. They're compelling and memorable places for people to gather because they leverage the topography of the hillside. They endure yet they welcome change.

Manfredi: We have always advocated the idea of designing spaces that have a loose fit to them—meaning that they're not so carefully crafted for a particular moment, and they're not so hyperarticulated that if the function or the needs shift, they become obsolete.

You were selected to design the adaptive reuse of a former jail on the Trinity River in Dallas as part of the large urban project Harold Simmons Park, designed by Michael Van Valkenburgh Associates. How does social equity figure into your design approach?

Weiss: We begin by listening. We're learning a tremendous amount from our client—the Trinity Park Conservancy—and the communities, including people who had been incarcerated. The concept is to give expression to these voices and open up the walls. It's going to be a front door to the river and a front door to the community. We're inverting the paradigm of a closed fortification to create a place that is all about having room to breathe and connect.

Manfredi: Social equity and ecology aren't mutually exclusive; they're woven together. Architecture can make these paradigms legible and accessible to everyone.

What's the next big idea in cultural and public spaces?

Manfredi: Open space isn't a luxury. It is the great democratizer of our cities and it is central to the life of big cities. It's not a new idea, but it is a realization that has emerged in sharper focus through the tragic lens of the pandemic.

Do you think cultural institutions will emerge from the pandemic with a new set of design priorities?

Weiss: Cultural institutions are recognizing that their reach can improve because they are acquiring incredible skills at digital outreach. And they're creating new audiences through that.

Manfredi: Yes, and many of the cultural institutions we're working with have robust educational programs, which predate COVID. But now those educational programs, because often they're online or supplementing school systems that are under extreme distress, have become even more important and more crucial to those institutions' missions. Their artistic resources are deployed into the community.

Weiss: It's another dimension of accessibility, which is so important, especially when you're designing a public space to welcome every person or group you can imagine. At the Brooklyn Botanic Garden, we just completed the Robert W. Wilson Overlook, a 600-linear-foot-long slaloming switchback that makes a 20-foot grade change from the subway-entry side of the park into the heart of the garden. It's an improvement in accessibility but also in the quality of experience. You walk by the fragrance of herbs, the movement of grasses, and the beauty of crepe myrtle trees in a way that wasn't formerly possible. As we look at our institutions collectively pre- and post-pandemic, questions of equity and accessibility should be thought of not as accommodations but as opportunities to enrich and reflect the missions of the institutions.

At the La Brea Tar pits, why are you exposing some of the storage spaces, laboratories, and work rooms to public view?

Manfredi: The open space is an extension of the museum and has a pedagogical role. The ongoing paleontological excavations on the site are central to the museum's mission and exhibition program, so there's a built-in synergy between what happens inside and what happens outside. We wanted to break open the inside box of the museum so that those synergies would be much more apparent.

You also think about education as professors. What interests do your students bring to questions of public and cultural space?

Weiss: This generation values a couple of things differently. They're as excited about form as anyone has been, yet they're also excited about projects that have greater social relevance. They're mindful of their impact on the land, and topics of climate change are intrinsically embedded in concepts of architecture and urban life. We're seeing the formal, social, and ecological ambitions merging together in inspiring ways.

Following 2017's Hurricane Irma, Weiss/Manfredi created a central courtyard at Artis—Naples, in Naples, Fla., which has hosted live performances during the COVID-19 pandemic.

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A Dream Deferred

Behold the American Dream, a mega shopping mall in the New Jersey Meadowlands that sports a dizzying array of attractions, including an indoor ski slope and water park. Sixteen years in the making, the project endured multiple lawsuits and bankruptcies before finally opening—just in time for the pandemic. As the American Dream—both the project and the idea—now stand in limbo, ARCHITECT contributor Karrie Jacobs visited the complex to see what lessons it might hold about the future of madcap development and destination retail. Read her story at architectmagazine.com.

> *Go to bit.ly/KarrieJacobsAmericanDream.*

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To stay within budget, PAC-CLAD Flush panels were specified in Bone White and Stone White to create a subtle vertical pattern, broken up with broad bands of Charcoal Gray and blocks of Matte Black Corrugated panels to complement the other colors.

SkyVue Apartments, Pittsburgh, PA Installing Contr.: Wyatt Inc. Architect: Niles Bolton GC: Massaro Corp.
Material Distributor: Brock Associates Owner: RISE: A Real Estate Company Photo: hortonphotoinc.com

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