

AIA's Robert Ivy Reflects  
Bryan C. Lee Jr. on Design Justice  
Sustainable Products Highlights

Doreen Adengo  
River Architects

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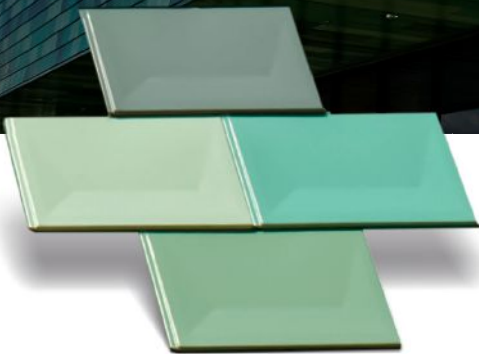
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# A Contents

Volume 110, number 06. September 2021.

On the cover: *The Kendeda Building for Innovative Sustainable Design at the Georgia Institute of Technology, Atlanta, by Lord Aeck Sargent in collaboration with The Miller Hull Partnership; photo by Gregg Willett.*

Below, left to right: *Lafayette College Rockwell Integrated Sciences Center, Easton, Pa., by Payette; Rainier Beach Clinic, Seattle, by Mahlum Architects; MIT.nano at the Massachusetts Institute of Technology, Cambridge, Mass., by HGA; photos by Robert Benson Photography, Benjamin Benschneider, and Anton Grassl/Esto, respectively.*

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# Luxury wellness design is changing. What's next?



## THE IDEA THAT A HOME'S DESIGN CAN PROFOUNDLY IMPACT ITS RESIDENTS' HEALTH AND WELL-BEING IS NOTHING NEW:

Designing for wellness has drawn increasing attention during the past decade. But that interest has understandably skyrocketed during the global COVID-19 pandemic, especially among high-end clients, who want their homes to protect and nurture their families' physical and mental health.

How will luxury residential design morph to create even healthier environments as a result of the pandemic? What existing trends will evolve to contribute to healthy homes?

Watch the on-demand webinar "Redefining the High-End Healthy Home," produced by Hanley Wood University and sponsored by Gaggenau. In this roundtable, recorded during a live virtual event in May 2021, facilitator Jennifer Castenson leads a discussion of the emerging and evolving trends in healthy home design. She's joined by a panel of residential architects.



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Danielle Tillman,  
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Noah Walker  
Principal, Walker Workshop



Takashi Yanai  
Partner, EYRC

This webinar is approved for AIA and IDCEC continuing education credit. In addition, course registrants will gain access to a white paper on the same topic.

### ON-DEMAND WEBINAR:

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How luxury single- and multi-family residential design is responding to a post-pandemic need to maintain and improve the health of inhabitants.

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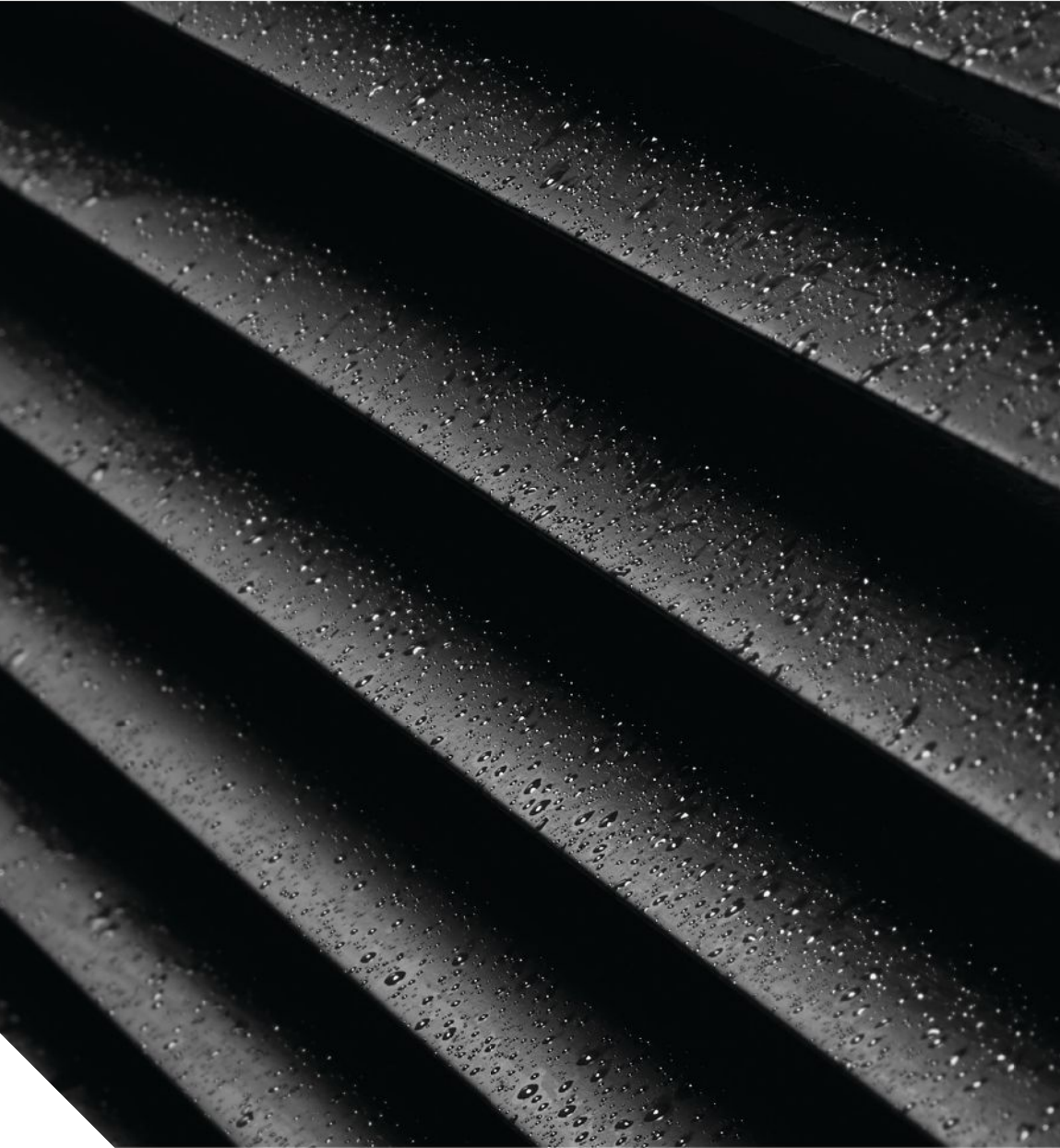
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# Typology:

## Seminary Hill Orchard and Cidery Callicoon, N.Y. River Architects

TEXT BY MADELEINE D'ANGELO

In 2012, Douglas Doetsch and Susan Manning returned to their families' agrarian roots and opened an organic apple orchard in Callicoon, N.Y. After developing their crops, the couple contacted the Hudson Valley, N.Y.-based River Architects in 2014, outlining plans for a cidery on their land at the foothills of the Catskills. But as the group toured the 62-acre property, a sloping, open parcel overlooking rolling hills and the Delaware River captured their attention. The project vision became a new, bank barn-inspired cidery that could help sustain the Hudson Valley as a tourist destination and place of employment. Completed in June, the two-story, 9,300-square-foot Seminary Hill Orchard and Cidery merges sustainable agriculture with environmentally conscious architecture.

River Architects, led by founder Juhee Lee-Hartford, AIA, has a wealth of experience with residential Passive House design, but for the rest of the project team, including Poughkeepsie, N.Y.-based builder Baxter, the cidery was an introduction to the rigorous energy standard. "[The cidery is] definitely not an easy [typology] to start with because it's not repeated units of apartments that just go up in a block," Lee-Hartford says.

The team wanted to avoid a scenario in which "electricians, plumbers, or mechanical installers come through and cut holes in something that somebody else took a lot of great



**1.** The podium of the bank barn-inspired cidery is clad in locally sourced bluestone. **2.** On the side entry, light filters through larch slats and a protective polycarbonate layer.

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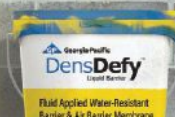
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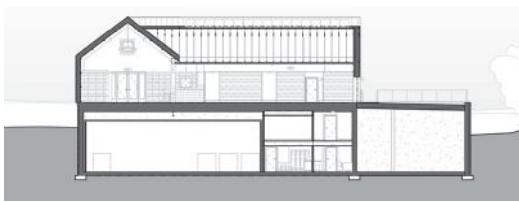


**Typology:**  
**River Architects**

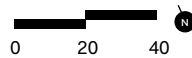
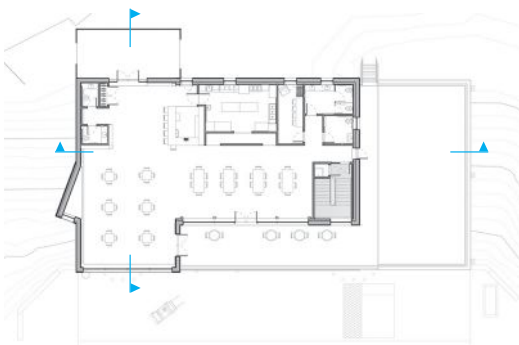
Cross Section



Longitudinal Section



Upper-Level Floor Plan

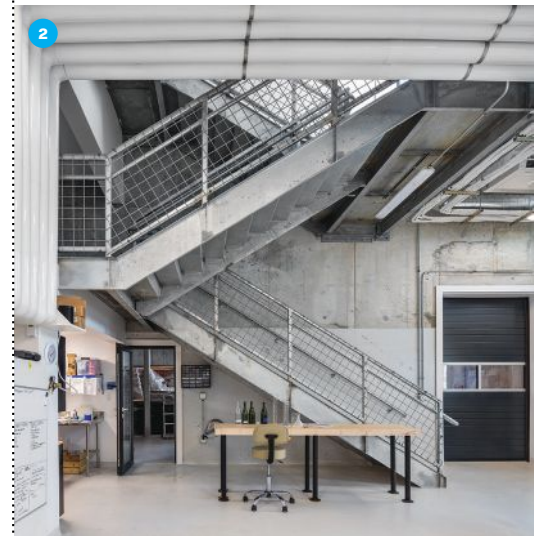


care in making airtight," says River Architects technical partner James Hartford, AIA, who also founded the Hudson Valley chapter of the Passive House Alliance U.S. When construction began in 2019, the firm organized a Passive House kickoff workshop to ensure a "clear understanding of the goals and the methodology," he says. The designers walked the entire team through the project details, highlighting the unique features of the durable, timber-framed structure.

With its gabled roof and larch siding—a naturally rot-resistant wood reclaimed from the original Tappan Zee Bridge—Seminary Hill embraces classic agrarian forms while its standing-seam metal roof and photovoltaic array hint at the structure's passive nature. An open-air entry clad in larch slats over polycarbonate nods to the breathability of hay barns, offering a sheltered transition between the interior and exterior—and an inviting glow when illuminated at night.

River Architects kept Seminary Hill's lower-level fermentation, production, and storage rooms airtight with an envelope of cast-in-place concrete mixed with Poraver expanded glass. The lightweight aggregate not only improves concrete's thermal performance but also reduces the quantity of concrete needed and, subsequently, the project's cost and carbon footprint. The podium envelope also uses vapor-resistant insulation to maintain a 10- to 15-degree F temperature variant between the cool and humid production spaces and the commercial and event spaces above. Overhead doors and on-grade access directly connect production rooms to the orchards, which include an on-site gray-water treatment system.

For the upper level, the architects used structural insulated panels while maintaining extensive access to daylight and exposed timber beams. A blue-tiled tasting bar between the entrance and a commercial kitchen invites visitors to linger. The design



**1.** The upper level includes an open-plan events space with white oak flooring and whimsical lighting fixtures from Olde Brick Lighting that emulate apples dangling from a tree branch. **2.** A Sikafloor cement and aggregate screed provides a durable floor for the cidery's lower-level production and fermentation rooms.

team also installed a south-facing pop-out window bay on the structure's western wall to deflect any blistering sunlight that might overheat the space. "Instead of having a big, long blank wall, we were able to break in and create deep penetrating light and views," Hartford says.

For now, Seminary Hill is the world's only Passive House-certified cidery, but River Architects hopes it will have company soon. The firm is training each team member to become a certified Passive House consultant, Lee-Hartford says, with the hope of growing a community commitment to "intelligent and sustainable architecture."





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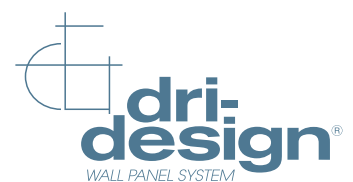
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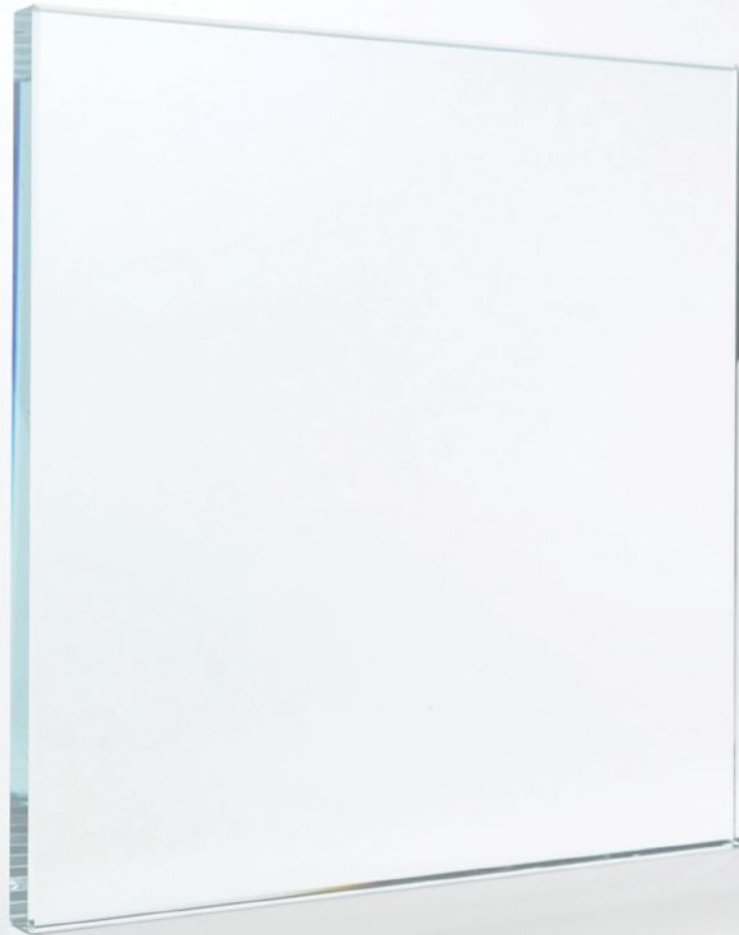
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# Opinion: Driven by Disease

TEXT BY SHIRLEY BLUMBERG, AIA



Throughout history, disease has had a profound impact on urban life and design. What has the COVID-19 pandemic taught us about creating a better future?

Urban population density fuels the spread of illness, particularly in areas with poor living conditions. But monumental public health crises have also advanced the design of cities, indelibly defining them for the future. In the 19th century, London and Paris built robust and unprecedented sewer and sanitation systems to counter the threat of cholera. Additionally, Napoléon III appointed Georges-Eugène “Baron” Haussmann to reimagine Paris with a vast public works program of generous avenues, parks, and squares that introduced light and air to the city center.

Before the mid-20th century breakthrough development of antibiotics, treatment for tuberculosis was largely environmental: fresh air, sunlight, rest, and nourishing food. In New York, when we believed the lack of fresh air caused malaria and cholera, Frederick Law Olmsted designed Central Park to be “the lungs of the city.”

Perhaps Alvar Aalto set the standard with his approach for Paimio Sanatorium, completed in Finland in

1933: He believed we should design for the person in the weakest position.

The COVID-19 pandemic not only joins the list of long-standing global problems—including inequity, populism, social unrest, mass migration, and climate change—but it also underscores them. For example, the necessity of social distancing has made clear design shortcomings in our public realm: narrow sidewalks, too much land surrendered to cars, and insufficient public spaces and parks for people to gather safely. In response, some cities are converting streets to pedestrian walkways and building more extensive cycling networks.

The pandemic has also revealed how inextricably bound we are to the global community—and how fundamentally reliant we are on each other. The international collaboration and the extraordinary speed at which scientists developed highly effective vaccines give us hope that the disruption from life as we knew it will inspire us to imagine our world anew.

Driven by disease, architects and city planners worldwide are called upon to respond to urgent societal challenges. Under pressure from this existential threat to humanity, tectonic shifts are underway in our design culture. Like scientists, who took on the seemingly insurmountable challenge of developing successful vaccines for the coronavirus in an impossibly tight time frame, architects and engineers can achieve lasting

change. But it does require political will and innovative entrepreneurs.

Imagine if architects came together to solve the global housing crisis. The pandemic has exposed the appalling conditions in long-term elderly care, the lack of housing for those experiencing homelessness, and overcrowded living conditions in underserved neighborhoods.

Imagine if city governments realized how public green spaces are essential for people's health and well-being—as COVID-19 demonstrates daily—and took action on the current inadequacy of the size and quality of our urban public realm.

As the New Orleans–based design justice activist Bryan Lee Jr. has written, “For nearly every injustice in the world, there is an architecture that has been planned and designed to perpetuate it.” The built environment is not equitable. Injustices and exclusion are embedded in our cities, and architects have been complicit. Who gets access to affordable housing, and who does not? Who can occupy public space without fearing for their lives, and who cannot? Who can seamlessly work from home, and who cannot?

Our cities have many scars. Can public space be a place of healing? Can we create trust within communities through how and what we design and build?

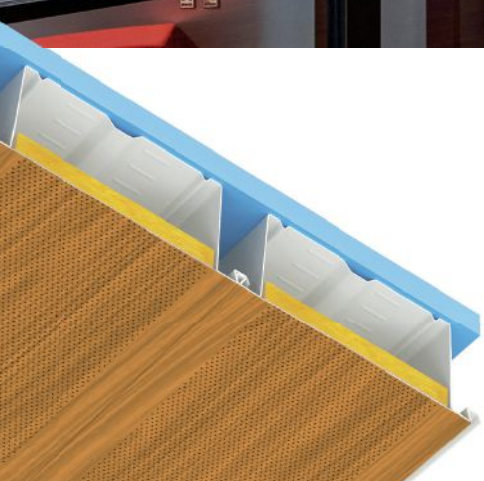
Imagine if design was driven by *generosity*, if architecture offered people freedom and choice as to how to inhabit the space in which they live.



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**Opinion:  
Driven by Disease**

Encouraging examples are underway. In 2020, Paris Mayor Anne Hidalgo launched the “15-minute city” plan, where every resident will have their most frequently used amenities available within a 15-minute walk of their home. Additionally, the city recently completed Clichy-Batignolles, an eco-district situated on a former rail yard that combines passive-house buildings with a robust green infrastructure of public space and serves as a laboratory for building future carbon-neutral cities.

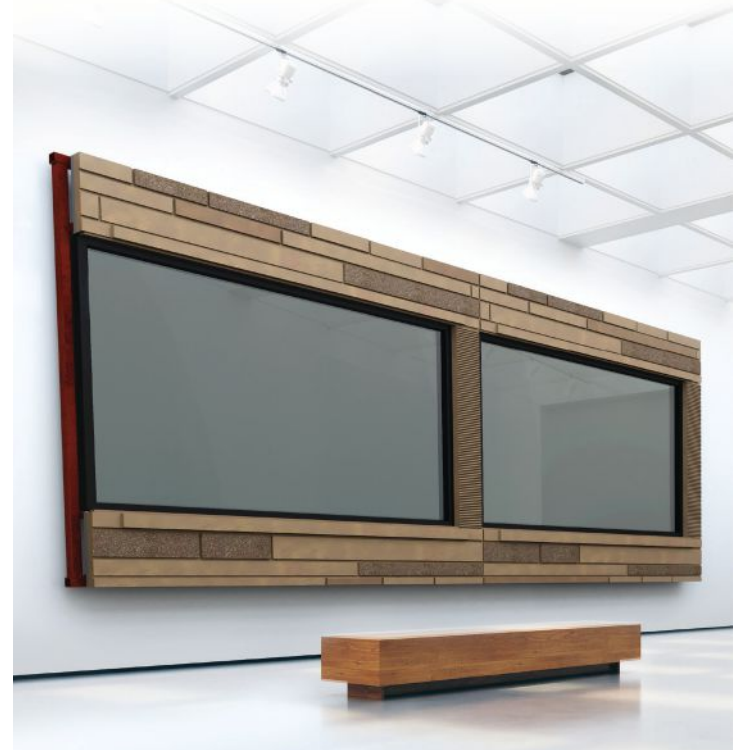
Pritzker Prize winners Anne Lacaton and Jean-Philippe Vassal are renowned for their imaginative reuse of buildings, intervening with the most economical of means to create gracious housing and cultural buildings. “Economy is not a lack of ambition, but a tool of freedom,” they believe.

Architects are first and foremost citizens. Our greater responsibility is to our fellow citizens. We live in a time when our synthetic skills of design-thinking and problem-solving have never been so relevant. Our collective work has social, environmental, and economic impact—and if we really understand this, we can help mitigate inequities and climate change *and* deploy our resources more wisely around the world.

*Shirley Blumberg, AIA, is a founding partner of KPMB Architects, in Toronto, and a member of the Order of Canada for her contributions to architecture and community.*

> To read more opinions, visit [bit.ly/AROpinion](http://bit.ly/AROpinion). Interested in writing? Submit your pitch to [architectmagazine@zondahome.com](mailto:architectmagazine@zondahome.com).

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# 2021 Sustainable Product Call Highlights

TEXT BY ARCHITECT STAFF

To shrink the building sector's carbon footprint, manufacturers are offering more innovative, environmentally friendly options. Selected from 75 entries to ARCHITECT's Sustainable Product Call, these 15 products show how design excellence permeates every aspect of a successful building.



## Grain + Bias, Milliken

Based on the imperfections visible on the reverse side of embroidery, this collection of modular, nylon carpet tiles has a 20% to 30% reduction in face weight compared with other Milliken carpets. These durable 19.7"-square tiles are available in three visually textured patterns—handspun, needlework, and burnout—and in 16 colorways. [floors.milliken.com](https://floors.milliken.com)



## Sunlit Days, Silestone by Cosentino

This carbon-neutral quartz surfacing collection is made with 99% reclaimed water, 100% renewable energy, and a minimum of 20% recycled raw materials in its composition, while reducing the presence of crystalline silica. Available in five hues, the collection suits high-traffic applications, such as countertops and wall cladding. [cosentino.com](https://cosentino.com)



## Coil Collection Naturals, LightArt

Inspired by the look of ceramic pottery, the shades in this 11-piece collection of pendant lights are 3D printed with 65% recycled resin from the waste of LightArt's parent company, 3form. Each fixture is assembled with a single LED module, a PVC-free cord, and powder-coated hardware. Available in a range of sizes, five colors, 2700K to 4000K color temperatures, and a color rendering index exceeding 80 or 90. [lightart.com](https://lightart.com)





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## 2021 Sustainable Product Call Highlights



### Britannica Block, Cambria

Composed of 99% recycled content, Britannica is laid in parallel lines, similar to butcher block, but with unique veining, patterns, and tonality set against a milky white background. Available in matte and high-gloss finishes, with different edge profiles, and in 1cm and 3cm thicknesses. Greenguard and Greenguard Gold certified. [cambriausa.com](http://cambriausa.com)

### Lambo Rainscreen System, Lamboo Technologies

Made entirely of engineered bamboo, this exterior and interior rainscreen system is approved for hurricane-rated zones. The system comes with a nominal 3", 5", or 7" facing, up to 16' in length, and in six colors, including butternut and pewter. Offered with curtain wall and storefront options. [lamboo.us](http://lamboo.us)

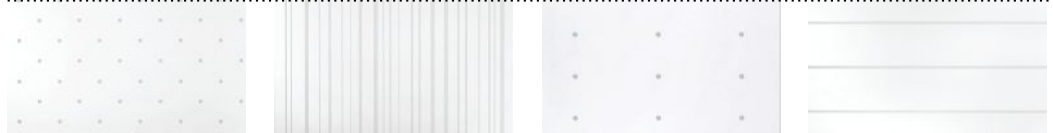
### Wave Collection, Polywood

Each of the four Adirondack chair designs in this collection repurposes more than 1,000 single-use plastic containers into outdoor seating. When arranged together, their contoured headrests form a cresting wave. The approximately 30"-by-35"-by-33" chairs feature continuous color and an ultraviolet-protectant. A new vintage finish evokes the character of matte-painted wood. [polywood.com](http://polywood.com)



### Data Tide Carpet Collection, Mohawk Group

The patterns of this carbon-neutral collection explore the relationship between nature and data. Available in eight colorways inspired by estuaries, the 12"-by-36" planks feature light-to-dark gradations to mimic transitioning waters. [mohawkgroup.com](http://mohawkgroup.com)



### Guardian Bird1st Etch Glass, Guardian Glass

To reduce the approximately 1 billion fatal collisions of birds with buildings each year, this translucent product offers four acid-etched patterns that adhere to the 2x4 rule alerting birds to the imminent obstacle. Available with a low-E coating option on surface 2 for insulated glass units. [guardianglass.com](http://guardianglass.com)



### Rampart Resolve, Wolf Gordon

Made of 30% recycled content and an olefin composite material, this wallcovering collection has been engineered to meet the demands of high-traffic areas. The PVC-free collection comes in two patterns: Inyo, a woodgrain available in a range of neutrals; and Luxor (shown), a raw linen pattern. [wolfgordon.com](http://wolfgordon.com)

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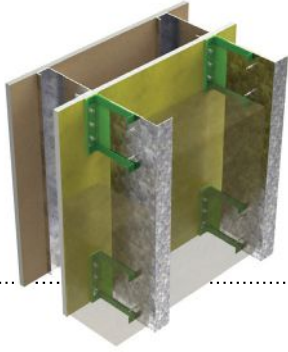
square three architecture | Bernard Andre Photography



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## 2021 Sustainable Product Call Highlights



### GreenGirt Delta Adjustable System, Advanced Architectural Products

This adjustable wall system enables the installation of continuous insulation on building envelopes and plane deviations and eliminates thermal bridging from metal framing and through-wall fasteners. [greengirt.com](https://www.greengirt.com)



### Freeform, Turf Design

The sculptural curves of this acoustical ceiling baffle can be customized, absorbing sound as needed in a space. Made from 60% pre-consumer PET felt, the 2"-thick baffles can achieve noise reduction coefficients from 0.55 to 0.95, depending on spacing. [turf.design](https://www.turf.design)



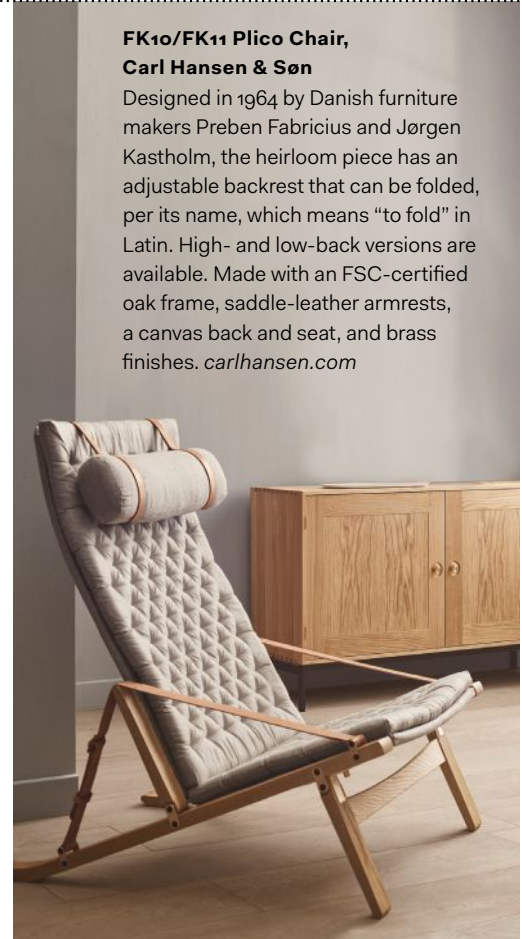
### The Universe System, Juniper

The low-voltage power distribution system can form a continuous 150-linear-foot run, hosting up to 16 LEDs on a single power supply. The 0.25" rail profile can be configured with connector nodes and pivot components to illuminate a space using miniature LED spots that click into place via magnets. [juniper-design.com](https://www.juniper-design.com)



### Wildwood Cladding, Fiberon

Composed of 94% pre- and post-consumer recycled wood and plastic, Wildwood offers a low-maintenance alternative to wood, according to Fiberon. Available in a variety of board sizes for horizontal and vertical orientations. [fiberoncladding.com](https://www.fiberoncladding.com)



### FK10/FK11 Plico Chair, Carl Hansen & Søn

Designed in 1964 by Danish furniture makers Preben Fabricius and Jørgen Kastholm, the heirloom piece has an adjustable backrest that can be folded, per its name, which means "to fold" in Latin. High- and low-back versions are available. Made with an FSC-certified oak frame, saddle-leather armrests, a canvas back and seat, and brass finishes. [carlhansen.com](https://www.carlhansen.com)



### SquareDrain, QuickDrain USA

For new and retrofit applications, this elevated stainless-steel point drain system is available in a range of styles and finishes. Each site-sizeable SquareDrain point pan repurposes up to 600 post-consumer recycled plastic bottles. [quickdrain.com](https://www.quickdrain.com)

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# CarbonPositive: Architecture's Critical Role at COP26

INTERVIEW BY KIRA GOULD, ALLIED AIA

For nearly two decades, Architecture 2030 has shaped national and international attention on the building sector. At COP21 in 2015, the nonprofit organization led the effort to highlight the critical role of the built environment in climate change. In November, Architecture 2030 will again press the issue, this time at COP26, with its president, Vincent Martinez, HON. AIA leading the delegation. Recently, Martinez—a 15-year colleague of Edward Mazria, FAIA—and I talked about the significance of COP26 and Architecture 2030's message to the assembled governments and nongovernmental organizations.

### Why is COP26 significant?

Government and business leaders from around the world will be converging at the United Nations Climate Change Conference of the Parties in Glasgow, Scotland, from Oct. 31 to Nov. 12. The COP has happened nearly every year since countries signed the U.N. Framework Convention on Climate Change in 1994; this will be the 26th meeting. This year's COP is of particular significance because it is the fifth meeting since the Paris Agreement (signed at COP21) and nations will be establishing new 2030 emissions reduction targets.

### Architecture 2030 underscored the built environment's role in climate change at COP21. How has your message evolved for COP26?

COP26 will hold a City, Regions and Built Environment Day under the COP Presidency Program and organized by our partners, including GlobalABC and World Green Building Council. Unfortunately, that event is scheduled to be the second-to-last day in the COP26 agenda and may be ineffective at swaying outcomes of the COP toward more aggressive action. As a

result, Architecture 2030 will be pushing the critical role of the built environment on the ground pre-COP and during every day of the conference. We intend to ensure that all assembled governments and NGOs understand that buildings play a massive role in cutting emissions—and that the time for bold moves is now, while we still have a chance to stay within the 1.5°C carbon budget.

### Can architects truly influence the COP outcomes?

The built environment is the largest source of the world's carbon emissions, contributing approximately 40%. When accounting for the embodied carbon of building interiors, systems, and associated infrastructure, that percentage is substantially higher. The building sector is transforming and taking action to mitigate and adapt to climate change, with a relatively small number of organizations, firms, and sub-national governments responsible for the majority of planning, design, construction, and development globally. By showing what is possible, we will embolden governments to do the same.



> To read the full Q+A with Vincent Martinez, visit [bit.ly/ARcpCOP26](https://bit.ly/ARcpCOP26).

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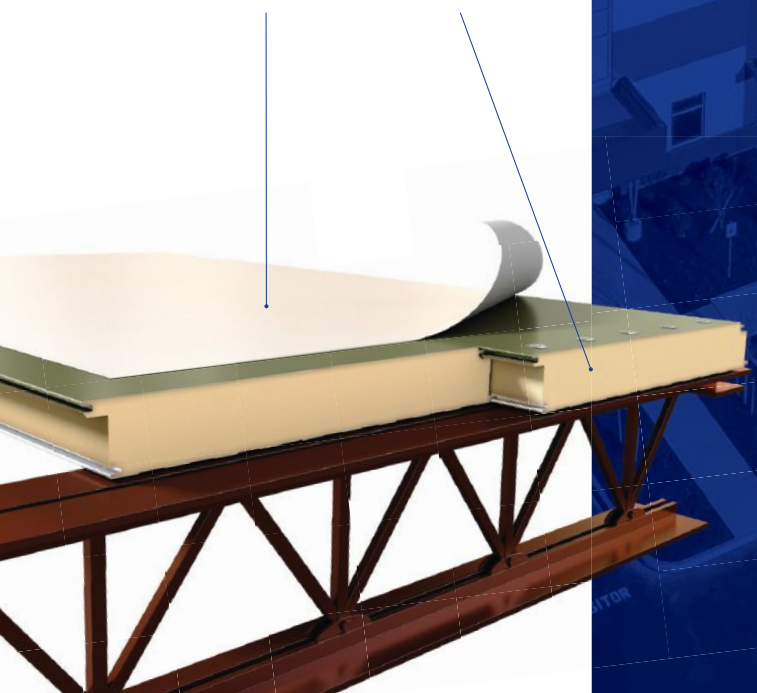
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# Next Progressives: Adengo Architecture

EDITED BY PAUL MAKOVSKY

**Location:** Kampala, Uganda  
**Year founded:** 2016



**Firm leadership:**  
Doreen Adengo, principal

**Firm size:**  
Six people: three architects, two graduate architects, and one accountant

**Education:**  
M.Arch. from Yale University; B.S. from The Catholic University of America

**Experience:**  
Adjaye Associates, Robert A.M. Stern Architects, Ellerbe Becket, and Gruzen Samton Architects

**Firm mission:**  
Our mission is focused on communicating the value of design in African cities. In a context where non-designers often build their own homes and other structures, we believe it's critical to make the case that architects and urban planners

can improve people's everyday lives, helping cities develop sustainably.

**First commission:**  
The Bujjuko School in Bujjuko, Uganda. The school is based on a series of one-story buildings, which have been placed with care on the site's sloping topography. A series of terraces formed by the land's grading offer outdoor space between the buildings for children and community members to gather, play, and garden. Because the school is located in a part of the country that experiences two rainy and dry seasons per year—with temperatures ranging from 68 F to 84 F and an average annual rainfall of 40 inches—we used passive design techniques to ensure comfortable interior environments and provided a rain-harvesting system to store water underground for use in the dry seasons.

**Defining project and why:**  
African Mobilities 3X3 project. This was a multidisciplinary collaboration in which our studio explored how Congolese traders and tailors transform the social, economic, and built environment in Kampala, while forging connections to places much farther afield. Working at multiple scales, we considered the impact of the Kitege trade at the global, regional, city, and neighborhood levels, with a focus on the 3x3-meter shop units that connect Congolese refugees to the global fashion industry.

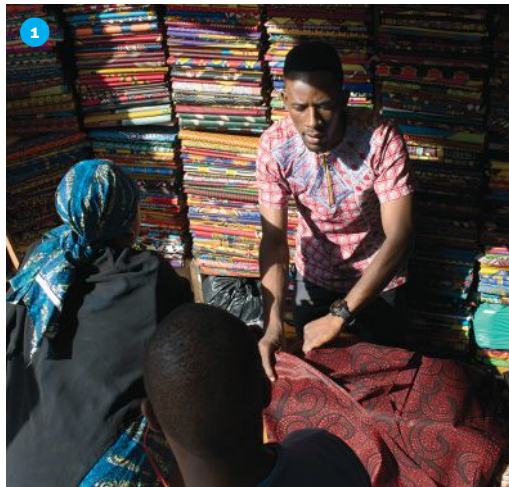
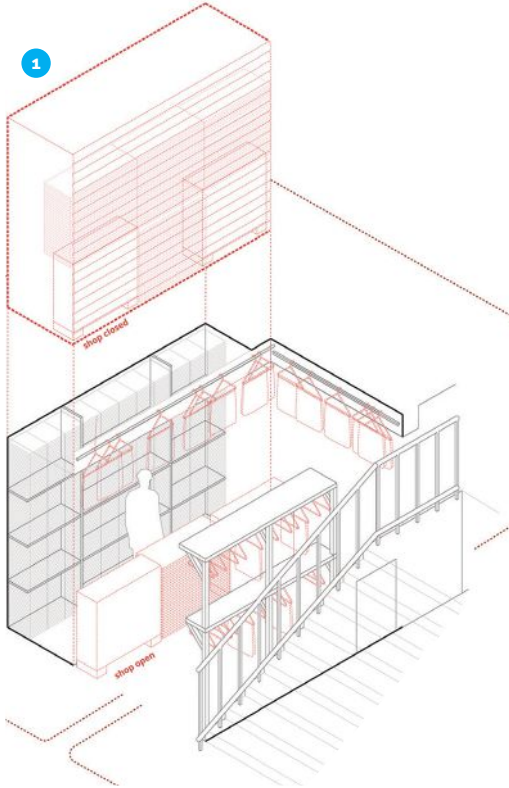
**Another important project and why:**  
Uganda National Museum, Conservation Management Plan, Keeping It Modern initiative with the Getty Foundation. This will be the first conservation management plan for a Modernist building in Uganda. It is my hope that this is only the beginning of a national movement to preserve our many Modernist gems.

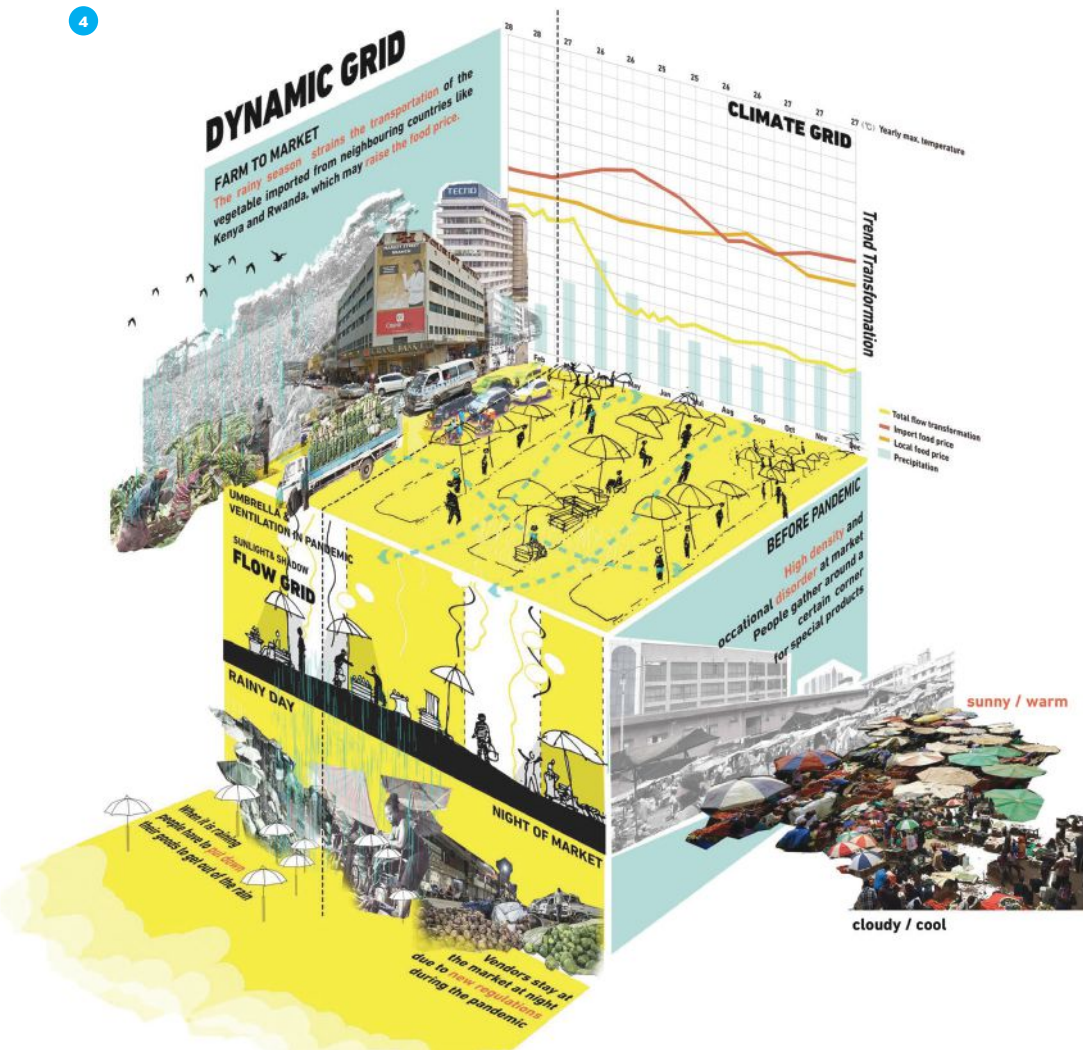
**Which architects or firms have influenced your practice and how?**

I was inspired by Adjaye Associates and Robert A.M. Stern Architects. I met David Adjaye, HON. FAIA, while I was a graduate student at Yale and interned at his office in 2004. It was important to have met someone whom I could identify with at that time, and I learned a lot about the studio environment. RAMSA was professional, and the office had a great library. Beyond the good training, there was an interest in research, which drives my practice today. My mentors include Adjaye, Issa Diabaté, and Louise Braverman, FAIA, who all run successful practices, and I continue to learn from them.

**Biggest career leap:**  
Around the time I started my practice in Uganda, I was featured on BBC's *First Person* series in 2014. At the time, the BBC was not really airing positive news coming out of Africa, so when it aired in the U.S. and the U.K. and on BBC World Service's *Focus on Africa*, I quickly became known in Kampala.

**Next Progressives:  
Adengo Architecture**





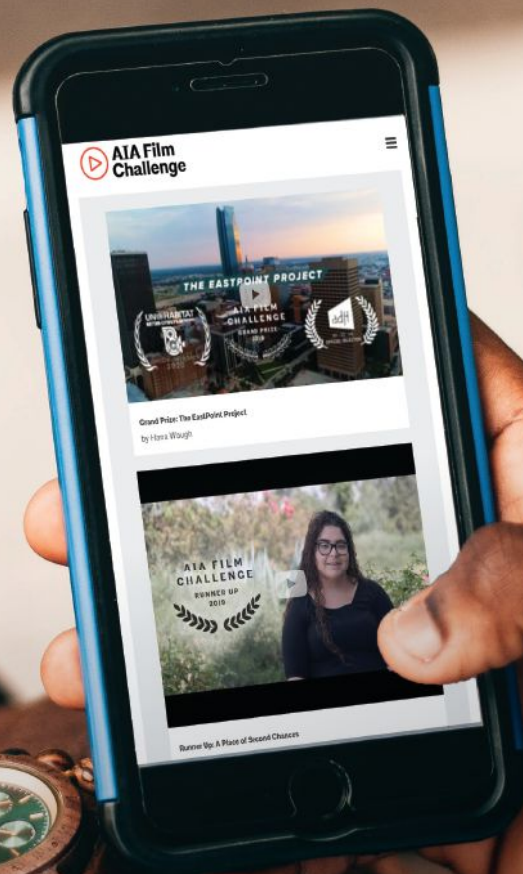
1. “African Mobilities 3X3” project. The global Kitenge trade provides a window into the connections and contributions that African migrants are making in the world. Combining photography, film, cartography, and architecture, this project explored the ways in which Congolese traders and tailors transform the social, economic, and built environment in Kampala, Uganda. 2. “African Modernism: Kampala Workshop.” As part of the “African Modernism” project led by German architect Manuel Herz, this workshop, co-curated by Doreen Adengo, explored the relationship between architecture and photography, and tasked the participants with finding “the story of the building” as told by the current user. The workshop documented Modernist buildings in Kampala such as the National Theatre, the Uganda Coffee Marketing Board Complex, and university student housing to increase awareness of these buildings so that they can be protected. 3. Uganda Museum, Conservation Management Plan, “Keeping It Modern” initiative. The Uganda National Museum, designed by Ernst May in 1954, is one of the first purpose-built museums in Africa and one of the first Modernist buildings in Kampala. Adengo Architecture is working with the Getty Foundation and other partners to come up with a conservation management plan for this important museum, which has been threatened with demolition on numerous occasions. 4. The Global Urbanism Studio 2020 workshop focused on markets and analyzed how changes have been made to adapt to the new government guidelines for COVID-19. The studio speculated on possible futures in light of the current crisis juxtaposed with the challenges faced as a result of climate change, and also explored innovative ways of representation, combining film, photography, mapping, interviews, and architectural drawing. 5. The Bujjuko School, Bujjuko, Uganda. In this largely agricultural region, community members spend most of their time outdoors, retreating inside during the evenings. Adengo Architecture’s design echoed this pattern by providing a seamless relationship between the school’s interior and exterior.



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*Photo by WoodWatch on Unsplash*



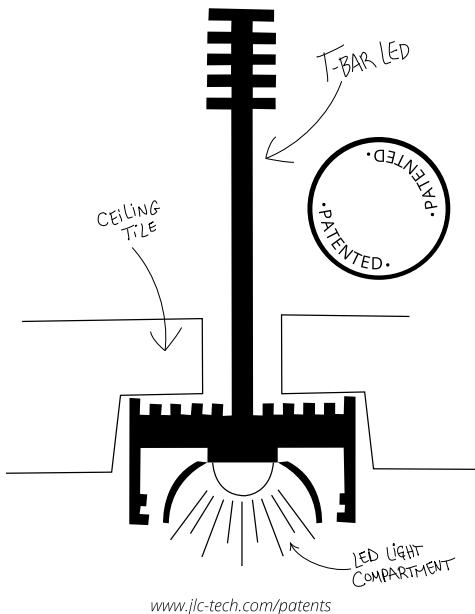


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Presented By:



# Rethinking Acoustics



*Credit: Adrien Williams*

By Viken Koukounian, Ph.D., P.Eng., and Niklas Moeller

**Acoustics is a vital part** of our everyday experience of the built environment; however, the role background sound plays in making these environments more comfortable for occupants is often overlooked. As a result, the misconception persists that acoustical dissatisfaction and lack of speech privacy can be resolved merely by limiting noise levels or blocking transmission.

Given today's focus on health and wellness, it seems prudent to revisit our acoustical lexicon with the intention of developing deeper awareness of the differences between background sound and noise, as well as their implications for our experience within facilities.

Refining our understanding of “noise” and “sound,” as well as terms such as “silence” and

“quiet,” allows for a more nuanced discussion of occupants' needs and expectations, and fosters opportunities to improve building design practices. Indeed, it is only by controlling background sound—in contrast to limiting background noise—that one can realize certain benefits, such as increased speech privacy and improved specification of construction requirements, as well as the associated labor and cost savings.

## ARCHITECTURAL ACOUSTICS

The study of acoustics dates back thousands of years. Given its roots are deeply entangled with those of mathematics and physics, it is unsurprising the typical approach to acoustic investigation is quantitative. Consideration of “soft”

## LEARNING OBJECTIVES

1. Establish a common language when discussing acoustical issues
2. Explain the role minimum background sounds plays in human perception of acoustics
3. Capitalize on the ways in which sound masking can be used as an architectural design tool
4. Address concerns regarding sound masking and the Lombard effect

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parameters (i.e., subjective and descriptive) is relatively scarce until the last century.

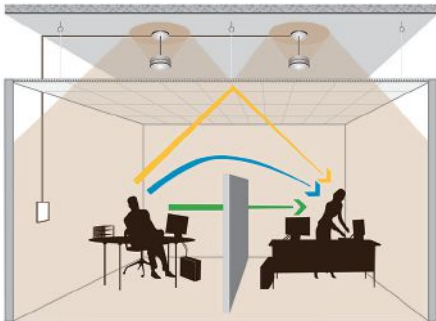
Interest in evaluating human response to acoustics gained momentum in the 1900s with the rise of architectural acoustics—also known as building or room acoustics. Most notably, contributions from Bell Telephone Laboratories, Bolt Beranek & Newman Inc., and others formed the foundation for psychoacoustics, a branch of psychology focusing on the perception of sound and its physiological effects. Research examined occupants' assessment of intruding noise (e.g., annoyance, distraction, inadequate acoustical privacy) in their environment.

Motivated by the need to develop an objective approach to effective architectural acoustical design, William Cavanaugh et al.



published *Speech Privacy in Buildings* (1962), asserting neither acoustical privacy nor acoustical satisfaction could be guaranteed by any single design parameter. This work was instrumental in what came to be understood as the ABCs of architectural acoustical design:

- A is for “absorb,” which involves providing sufficient, but not excessive, absorptive materials in order to reduce the amount of sound energy within the space.
- B is for “block,” which involves providing sufficient isolation within the space.
- C is for “cover” (or one might say “control”), which involves management of the spectral distribution and overall level of background sound within the space, with the intention of masking speech and noise—rather than, for example, adding biophilic sounds, with the intention of increasing occupant connectivity with the natural environment.



The ABCs of architectural acoustical design involve using a variety of methods and materials to absorb, block, and cover noise, with the intention of creating an environment that is more comfortable for occupants and supportive of their tasks. Credit: KR Moeller Associates Ltd.

Although the authors of *Speech Privacy in Buildings* appreciated the importance of background sound, they tended to use the words “noise” and “sound” interchangeably—a practice deeply rooted in historical habits, which continues today.

### The signal-to-noise ratio

Initially, acousticians such as those at Bell Telephone Laboratories were primarily interested in evaluating the conditions needed to clearly hear sounds. They determined the critical factor was the level of the desired sound—called the “signal”—relative to the background sound present in the listener’s location. In most cases, the background sound

used during testing was broadband and did not contain information (i.e., noticeable patterns, such as running speech, nature sounds, traffic noise); however, it was termed “noise” because it could potentially interfere with the intelligibility of the desired sound. The ratio of the desired sound to background sound was termed the “signal-to-noise ratio.”

In the above case, the “signal” is the sound one wants to hear because it conveys useful information, while the “noise” is an unwanted input challenging one’s ability to clearly hear the desired sound. As acousticians developed an understanding of background sound as a fundamental component of speech privacy,

the methodology—and the terminology—remained the same. Hence, the word “noise” continued to be used to describe the background—or, in this case, the masking—sound, despite the fact it was now being viewed in a positive light.

Understandably, the term “noise” can cause confusion when the “signal” is the unwanted sound and the “noise” is actually the desired background sound. Meanwhile, the general public tends to use “noise” as a non-technical descriptive word, typically when relating negative acoustical experiences—ones that are uncomfortable, annoying, disturbing, or even painful.

## GLOSSARY

**ABC Rule**—Refers to the strategies required to achieve effective acoustics within the workplace. ‘A’ is for ‘absorption,’ ‘B’ is for ‘blocking’ and ‘C’ stands for ‘control,’ which involves establishing an appropriate minimum background sound level and spectrum using a sound masking system.

**Articulation Index**—A measure of the intelligibility of speech, the articulation index (AI) is rated from 0.00 (no intelligibility) to 1.00 (perfect intelligibility). The range is divided into four qualitative privacy categories, including Confidential (0.00 to 0.05), Normal (0.05 to 0.20), Marginal (0.20 to 0.30), and None (0.30 to 1.00).

**A-Weighted Sound Level**—The standard measure of the sound pressure level that approximates the sensitivity of the human ear at moderate sound levels. A-weighted sound level (dBA) de-emphasizes high and low frequencies because the ear poorly perceives these.

**dBA**—The standard measure of the sound pressure level that approximates the sensitivity of the human ear at moderate sound levels. A-weighted sound level (dBA) de-emphasizes high and low frequencies because the ear poorly perceives these.

**Masking Spectrum**—A masking spectrum—also called a ‘curve’—is engineered to balance effective acoustical control and comfort, and forms the basis for the synthesis of masking sound. When a masking system’s measured output is professionally-tuned to meet this spectrum from 100 to 10,000 Hz, occupants’ perception of the final product may be described as ‘quiet’ and ‘comfortable.’

**Pink Noise**—Pink noise is similar to white noise, but rather than being constant in volume, it decreases at a steady rate as frequency increases (3 dB per

octave); however, because these decreases are offset by the increases created by the doubling of frequencies in each octave, pink noise is constant in volume per octave. Pink noise is less hissy than white noise, but due to the relatively louder low frequency volumes tends to have a rumbling characteristic similar to that of a waterfall.

**Psychoacoustics**—The study of the psychological and physiological effects of sound and its perception.

**Signal-to-Noise Ratio**—The ratio of the desired or undesired sound to background sound levels.

**Sound Masking System**—An acoustical technology consisting of a series of loudspeakers installed in a grid-like pattern in the ceiling that distribute a background sound most often compared to that of softly blowing air. By raising the background sound level within a space, masking obscures conversations and noises that are lower in volume and reduces the disruptive impact of those that are higher by minimizing the degree of change perceived by listeners, improving privacy and productivity.

**Sound Transmission Class**—A sound transmission class (STC) rating indicates how well a building partition (e.g., walls, ceilings, floors, doors, windows) attenuates airborne sound. The higher the rating, the better the sound isolation; however, lab-tested results often differ from those performed in the field.

**White Noise**—A term often used interchangeably—but mistakenly—with ‘sound masking.’ This type of sound has a wide frequency range (typically from 20 to 20,000 Hz) generally randomly produced, with equal volume across the entire range. Occupants perceive it as ‘static’ with an uncomfortable, hissing quality.

To highlight the difference in the way in which “noise” is used, consider an individual working in an office, who complains about “noise” to a colleague. There are several sources of sound within the space (exterior traffic, a fan, and a radio playing music), but the source bothering the individual is a heated debate taking place in the meeting room adjacent to their workspace. In this scenario, the terms are defined in this way:

- **Sound:** There are four sound sources identified in the workplace.
- **Signal:** The noise capturing the individual’s attention (i.e., the debate) and, hence, the cause of their complaint.
- **Noise:** The individual uses the word “noise” to describe the debate. However, if the term is used in a technical assessment of this environment, the “noise” is actually the combination of all other sound sources (i.e., the traffic, fan, and radio), excluding the signal (i.e., the debate).

Technical use of the word “noise” requires a “signal.” In this case, noise accounts for the combination of sounds (i.e., it considers everything that is not the signal), while the signal only considers the source of the sound that is of interest.

## THE HUMAN FACTOR

What turns a “sound” into a “noise” in the common vernacular? Humans demonstrate remarkable tolerance to sound and are only susceptible to its disruptions when they become aware of it—typically when the level of sound is too high, its qualities are



An individual’s assessment of sound depends on a variety of factors, such as their expectations for the environment, the task in which they are engaged, the sound’s level and frequency content, as well as the level and spectral distribution of background sound present within the space. Photo © iStockPhoto/Emir Memedovski

unbalanced (e.g., it is too “hissy” or “rumbly”), or it presents with temporal instability of its dynamic range (i.e., the change and/or rate of change in sound level over time).

## Context

A person’s assessment of sound generally depends on personal preferences and expectations for the occupied environment, as well as the activity in which they are engaged. For instance, consider a conversation at “normal level” in two environments: a library and a busy restaurant. In the former, nearby occupants engrossed in a task requiring concentration are likely to find the conversation too loud, annoying, and disruptive. In the latter, the level of conversation may not be sufficiently loud to allow for clear communication. Expectations are based on an understanding of the purpose of the space and the task at hand.

## Content

One’s description of sound tends to focus on two main properties: its level (often referred to as volume) and its spectral distribution. A “hissy” or “screechy” sound is one that has a lot of high-frequency information (e.g., a young child screaming). A “bassy” or “rumbly” sound is one with a lot of low-frequency information (e.g., a lion roaring). A space without a balanced sound spectrum can sound worse than one with a higher sound level but with a balanced spectrum.

## Cover

The human experience is also determined by the space’s background sound level, which is considered to be the collection of all (ambient) sounds within it. Often, a room is too “silent” (i.e., its ambient level is too low) and a source of sound becomes uncomfortable (e.g., a clock ticking, cars driving by, people talking, lights humming). In these cases, the “signal” is disturbing because its level is higher than the background sound. The disruptive impact of these annoying noises can be lessened by reducing the signal-to-noise ratio, which is achieved by raising the background sound level. In some cases, it is possible to raise the background sound level sufficiently to completely cover up these unwanted sounds.

## THE NEED FOR CONTROL

Given both the scientific and human factors, one can readily see there are advantages to controlling background

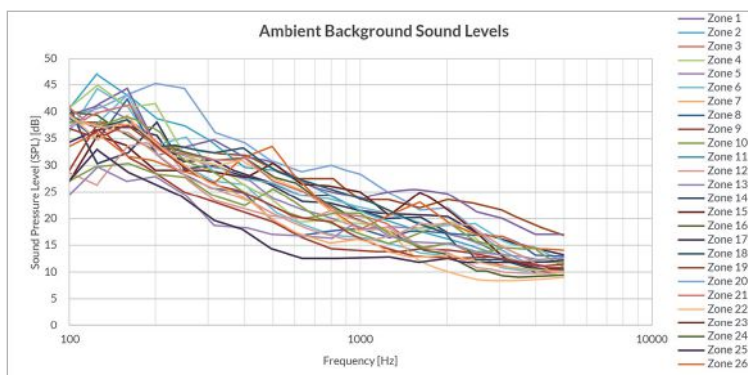


Figure 1: Many people assume that the acoustic conditions are uniform throughout a facility, but without the use of a properly designed and commissioned sound-masking system, it is never the case. In this example of an unmasked space—one floor, primarily consisting of open plan—the “natural” background levels of the unoccupied space vary considerably between the 26 zones in which ambient measurements were taken. Credit: KR Moeller Associates Ltd.

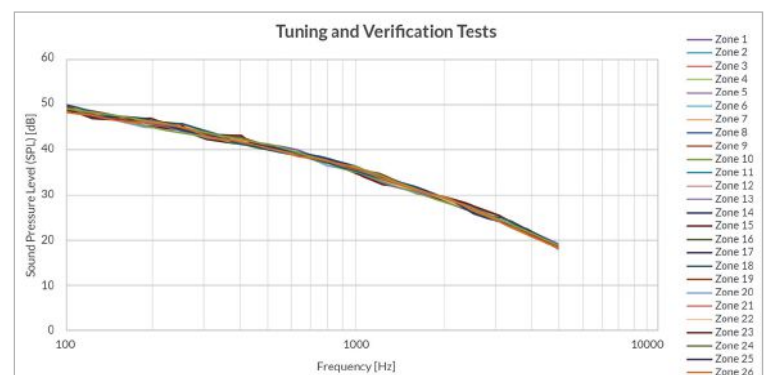


Figure 2: These inconsistencies can be addressed using a sound-masking system—the only acoustical treatment that can accurately control the background sound level within a facility. Here, you can see the difference when masking sound is applied and tuned so that it consistently meets the NRC curve within each zone to ensure uniformity of acoustic conditions throughout the space. The acoustically consistent environment is more comfortable—or “quiet”—for occupants. Credit: KR Moeller Associates Ltd.

sound, rather than accepting large variations in its level and spectra.

The consequences of neglecting this principal parameter of architectural acoustical design is an environment that is perceived to be “noisy,” as presented in Figure 1. The alternative—to add sound to reduce the perception of a noisy environment—might seem counterintuitive, but consider Figure 2. By precisely controlling the spectrum and level of sound (in this case, to a target overall sound pressure level of 47 dBA), one can make the space sound more comfortable.

The difference between one’s experience in a space with a very low ambient level and one with a higher ambient level suggests that just as there is a need to differentiate between “sound” and “noise,” there is value in distinguishing between a “silent” space and a “quiet” one. Whereas “silent” infers the absence of sound, a “quiet” space can be characterized by a constant ambient sound that is comfortable and not readily noticeable by its occupants. Spaces such as these are perceived to be less “noisy” and more comfortable—or “quiet.”



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## SPONSOR INFORMATION



Industry leader KR Moeller Associates Ltd. has designed and manufactured sound masking systems for over 40 years, including the award-winning LogiSon Acoustic Network and MODIO Guestroom Acoustic Control. Worldwide distributors provide turnkey services and expert support. To learn more, visit [www.logison.com](http://www.logison.com) and [www.modio.audio](http://www.modio.audio).

## QUIZ

- The ABCs of architectural acoustical design involves:
  - Using absorptive materials
  - Providing sufficient isolation within the space
  - Managing the spectral distribution and overall level of background sound
  - All of the above
- The “noise” in “signal-to-noise ratio” refers to:
  - The level of background sound in the listener’s location
  - Background sound levels above 40 dBA
  - The point at which speech privacy is compromised
  - An uncomfortable sound
- When a layperson uses the word “noise,” they are typically referring to:
  - An unwanted sound
  - An acoustical experience causing physical discomfort
  - A sound that is interfering with the task on which they are trying to focus
  - All of the above
- A person’s assessment of sound generally depends on:
  - Their expectations for the space and the activity in which they are engaged at the time
  - The level and spectral distribution of the sound
  - The background sound present within the listening area
  - All of the above
- When used to help assess the acoustical privacy of spaces, “AI” means:
  - Auditory insufficiency
  - Articulation index
  - Audio index
  - Acoustic indicator
- In order to increase speech privacy while simultaneously reducing construction requirements, one needs to:
  - Add more absorptive materials
  - Establish maximum noise limits
  - Control minimum background sound
  - Build full-height walls
- Delivery of effective masking sound depends on:
  - How much the layout, furnishings, and finishings used in the space affect the sound
  - Complying with ASTM guidelines
  - Accurately tuning the sound produced within the space so that it consistently achieves the specified spectrum and level
  - Whether the loudspeakers are installed facing up or down
- The Lombard effect refers to:
  - An occupant’s assessment of intruding noise
  - Subconsciously raising one’s voice level to be more clearly heard within a noisy environment
  - A “bassy” or “rumbly” sound that contains a lot of low-frequency information
  - Precisely controlling the spectrum and level of sound
- “Acoustical privacy” is:
  - Simply another term for “speech privacy”
  - Relevant to occupants in closed rooms and in open plans
  - Measured using sound transmission class (STC)
  - Only important to particular facilities, such as hospitals
- The effectiveness of the masking sound is directly related to the sound-masking system’s ability to:
  - Closely match the specified curve throughout the space
  - Be installed in the plenum
  - Use downward-facing loudspeakers
  - Provide a sound that occupants will compare to softly blowing air

# Western Red Cedar—Often Imitated, Never Duplicated

Presented By:



## DESIGN VERSATILITY OF WESTERN RED CEDAR

Western Red Cedar (WRC) is one of nature's most outstanding building materials. Renowned for its performance and exceptional beauty, it brings warmth, character, and longevity to homes and non-residential projects worldwide. In addition, Western Red Cedar's natural durability and physical properties make it ideal for exterior applications such as siding, trim, decking, and interior applications such as paneling, windows, doors, ceiling treatments, and feature walls.<sup>2</sup> It is compatible with numerous architectural styles, from modern to traditional, and is endlessly versatile. This course will explore the design versatility of

Western Red Cedar, exterior and interior applications, and the value that Western Red Cedar brings to a project. Many materials such as vinyl and composites try to replicate the look of Cedar, but it is difficult to achieve the wood grain, color, and feel of real Cedar. We will compare Western Red Cedar to these alternative building materials and demonstrate how it is often imitated but never duplicated in numerous project applications.



### Finishes<sup>3</sup>

Western Red Cedar can be finished in various ways, providing a unique look for each project. Several different complementary finishes can even be used on a single project. An exterior wood finish for Western Red

## LEARNING OBJECTIVES

1. Explore the design versatility of Western Red Cedar, including finishes, profiles, and applications.
2. Discover the value Western Red Cedar can bring to a project, from return on investment via curb appeal to expansive outdoor living spaces.
3. Compare Western Red Cedar to alternative siding and decking materials and understand why the color and grain of Cedar are often imitated but never duplicated.
4. Examine a case study where Western Red Cedar was used for its versatility, value, and longevity.

## CONTINUING EDUCATION

This course is approved for AIA   & GBCI Learning Unit Credits.

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Solid-colored stains are opaque finishes with fewer volume solids than paint; they are available in a broad spectrum of hues that obscure the wood's true color but allow some of the Cedar's natural characteristics and texture to remain.

Cedar depends upon the desired appearance and the degree of protection required.

Exterior finishes perform best when the coating is applied to all surfaces (face, back, edges and ends).<sup>4</sup>

Cedar naturally gains a silver-gray patina over time, which is desirable for some clients and has the bonus of minimizing maintenance. Another popular trend is bleaching, which produces this weathered look faster than waiting for nature to take its course and results in a truly uniform gray appearance.

Alternatively, protective coatings can be applied that preserve the wood's natural color and appearance while ensuring maximum performance. Transparent and semi-transparent stains and penetrating oil-based stains can be applied to provide wood protection. Transparent stains do not alter the appearance of the Cedar. They only slightly modify the color (tone) of the wood but provide added protection from mildew and decay.<sup>5</sup>

Solvent-borne, oil-based, semi-transparent stains penetrate the wood surface and do not form a surface film like paints. These finishes are the best choice for Western Red Cedar, which is fully exposed to the weather when a natural look is desired. Although these stains can be used on smooth and textured Western Red Cedar, they will perform much better and last longer when applied to a textured surface. In addition, these stains contain pigments that provide color—including cedar tones—and significantly increase the durability of the

finish by protecting the cedar surface from the damaging effects of the sun's ultraviolet rays. Service life on siding applications with semi-transparent stains may vary from three to six years depending on the cedar surface texture, quantity of stain applied, and the intensity of the sunlight on the wood surface.<sup>6</sup>

While many homeowners prefer to showcase Western Red Cedar's beautiful texture and color with a natural finish, some prefer to use an opaque coating such as paint or solid-colored stains. Paint provides the most protection against weathering and wetting by water while providing color and concealment of some of the wood's characteristics. Although paint can reduce wood's absorption of water, paint itself is not a preservative.<sup>7</sup> A stain-blocking primer must be used.

Solid-colored stains are opaque finishes with fewer volume solids than paint. Like paints, solid-color stains protect Western Red Cedar against ultraviolet light degradation and moisture. They are available in a broad spectrum of hues that obscure the wood's true color but allow some of the Cedar's natural characteristics and texture to remain. These finishes are non-penetrating and, like paints, form a film.

Western Red Cedar has naturally occurring extractives, but without a proper base coat, those same extractives may discolor opaque finishes such as latex paints and solid-color stains, so a stain-blocking primer must be used.<sup>8</sup>

Some building owners may desire a distressed, rustic, reclaimed, vintage, antiqued or aged look. This look can be achieved by roughing up the wood with a hammer, crowbar, or nails or dragging a coarse wire brush or steel wool in the direction of the grain to leave striations. Authentic reclaimed and distressed Western Red Cedar is available for purchase in some markets.

**Important Note:** Each of these finishes can be factory applied for optimal results, but if siding will be finished on-site, follow best practices and specify that product is applied to all six sides of each board. All cedar products used in exterior applications require a degree of maintenance to keep them looking their best. Even if the choice is made not to apply a finish to Western Red Cedar, contaminants such as dirt and mildew should be regularly removed to maintain its beautiful, natural appearance.<sup>9</sup>

### Profiles

Western Red Cedar bevel siding is the most widely used cedar siding type. It is produced by resawing lumber at an angle to produce two pieces thicker on one edge than the other. The manufacturing process results in pieces with one face saw textured. The other face is smooth or saw textured depending on the grade and customer preference. Bevel siding is installed horizontally and gives an attractive shadow line that varies with the thickness of the siding selected.<sup>10</sup> Clear Rustic

## GLOSSARY

**Patina**—A surface appearance of something grown beautiful, especially with age or use<sup>1</sup>

**Transparent Stains**—Stains that do not alter the appearance of the Cedar; they only slightly modify the color (tone) of the wood but provide added protection from mildew and decay

**Semi-Transparent Stains**—Solvent-borne, oil-based stains that penetrate the wood surface and do not form a surface film like paints

**Solid-Colored Stains**—Non-penetrating opaque finishes with fewer volume solids than paint; they obscure the wood's true color but allow some of the Cedar's natural characteristics and texture to remain

**Bevel Siding**—The most widely-used cedar siding type that is produced by re-sawing lumber at an angle to produce two pieces thicker on one edge than the other; one face is saw textured while the other face is smooth or saw textured depending on the grade and customer preference

**Bleaching**—Weathering products designed to provide the weathered look of

cedar sooner and more evenly than natural exposure to sunlight; they are lightly tinted with either gray or brown pigments, which mute the natural coloration and accelerate the weathering process

**Board and Batten**—A vertical design created using wide clear or knotty cedar boards spaced apart with narrower boards (battens) covering gaps between the boards

**Pressure Treating**—A process that forces wood preservatives or fire-retardants into the wood; the preservatives protect the wood from attack by wood-ingesting insects like termites and wood rot caused by fungal decay

**Acetylation**—A process that subjects a non-durable softwood to a vinegar-like solution, which turns it into a hardwood by preventing the cells in the wood from being able to absorb water

**Tongue & Groove**—Western Red Cedar siding furnished kiln-dried, manufactured in clear grades, and available with one rough or smooth face; in standard patterns, these are usually reversible



The different joints and surface textures in tongue and groove siding combine to provide a range of shadow line effects that enhance the product's versatility; the image on the left shows a flush joint tongue and groove, while the image on the right is a fineline tongue and groove.



or Tex grade bevel siding is recommended for use as sidewall covering where the distinctive charm of a rustic saw textured appearance is desired. This grade allows limited characteristics that do not detract from serviceability.<sup>11</sup>

Western Red Cedar tongue and groove is widely used for its good looks and versatility. It can be installed horizontally or vertically with each method giving a distinctly different look. The joints between adjoining pieces are usually V-shaped, but flush joint, fine line, and radius edge details are also available. In addition, the different joints and surface textures in tongue and groove siding combine to provide a range of shadow line effects that enhance the product's versatility.<sup>12</sup>

Lap sidings, such as channel siding, can also be installed vertically or horizontally. For example, in channel siding, the profile of each board partially overlaps that of the next board, creating a channel that gives shadow line effects, provides excellent weather protection, and allows for dimensional movement.<sup>13</sup>

Board and batten is a vertical design created using wide clear or knotty cedar boards spaced apart with narrower boards (battens) covering the gaps between the boards. There are no set board or batten widths—various combinations are used to create different looks suitable for large- or small-scale applications. Board on board is a slightly different version of board and batten.

Panels of cedar shingles can be used as an accent, such as in gables, or they can be installed as the primary siding. These 8-foot, single-course panels make it easier than ever

to install real cedar shingle siding. Several styles are available, including staggered butt and fancy cuts such as diamond-point and fish scale.

#### Textures

Western Red Cedar products are available with a smooth (planed) or a textured surface. As a rule, textured surfaces provide the best mechanical adhesion finishes to the wood; for smooth-surfaced Western Red Cedar, a two-

coat paint system is preferred.<sup>14</sup> Western Red Cedar boards may be specified in one of three surface finishes: rough, surfaced one side and two edges (S1S2E), or surfaced four sides (S4S). Other texture options include resawn and rougher headed.

#### Grades

##### Clear

Clear grades provide a premium quality appearance and are ideal for prestigious, upmarket applications. They are usually graded for smooth face exposure but are manufactured in both S4S and S1S2E form. The clear grades are visually clean and free from defects. There are only a few, if any, characteristics, including an occasional knot or minor imperfections. Clear grades, from highest to lowest grade, include Clear V.G. Heart, Clear Heart, A Clear, B Clear, C Clear and D Clear.

##### Knotty

Knotty siding has warmth and casual charm and is ideal for homes, cottages, clubhouses, and applications where a rustic appearance is desired. Knotty grades allow more inclusions,



Knotty grades allow more inclusions, meaning there will be knots and other characteristics; they are an excellent and durable choice with a more casual, rustic appearance than clear Cedar grades.

meaning there will be knots and other characteristics. Appearance-wise, knotty grades of Cedar are an excellent and durable choice—they just have a more casual, rustic appearance than clear Cedar grades. All knotty products are well-suited for factory priming or finishing. Knotty grades include Select Knotty, which has knots and other natural features that are sound and tight, and Architect Knotty, which contains no open characteristics or through defects and is intended to be entirely usable with the resawn face exposed.<sup>15</sup>

### EXTERIOR APPLICATIONS

Western Red Cedar is ideal for exterior applications due to its insect resistance, moisture resistance, and overall durability. It can be used for siding, trim, decking, and landscape features such as pergolas and pavilions. As discussed, siding options include bevel, tongue and groove, lap siding, board and batten and board on board.

Real Cedar trim on the exterior of residential, commercial, or industrial buildings perfectly complements any architectural style and is compatible with all contemporary cladding materials. The ideal wood for exterior trim is Western Red Cedar. Its dimensional stability, longevity, ability to accept a wide range of finishes, resistance to decay, and natural good looks make it the only sensible choice for corner boards, fascia, skirting, and window and door trim.



This article continues on  
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### SPONSOR INFORMATION



The Western Red Cedar Lumber Association represents quality “Real Cedar” producers, distributors and retailers throughout North America. Founded in 1954 and known as “the voice of the cedar industry,” WRCLA offers extensive resources to assist with selection, specification and quality standards. For more information, visit [RealCedar.com](http://RealCedar.com).

### QUIZ

- Which surface treatment produces a weathered look faster than natural aging and results in a truly uniform gray appearance?
  - Transparent stain
  - Semi-transparent stain
  - Bleaching
  - Penetrating oil-based stain
- Which of the following finishes only slightly modify the color (tone) of the wood but provide added protection from mildew and decay?
  - Transparent stain
  - Semi-transparent stain
  - Penetrating oil-based stain
  - Solid-colored stain
- \_\_\_\_\_ is the most widely used cedar siding type; it is produced by resawing lumber at an angle to produce two pieces thicker on one edge than the other.
  - Bevel
  - Tongue and groove
  - Lap
  - Board and batten
- \_\_\_\_% of Americans agree their outdoor living space is more valuable than ever before, with 78% making exterior upgrades during COVID-19.
  - 80
  - 85
  - 90
  - 95
- While Western Red Cedar is naturally decay and insect resistant, other wood species must be treated to achieve similar durability; which of the following is a process that forces wood preservatives or fire-retardants into the wood to extend and preserve timber life?
  - Cedar-tone
  - Acetylation
  - Pressure treating
  - Penetrating oil-based stain
- According to the course, which of the following is a disadvantage of pressure-treated wood?
  - Galvanized or stainless steel fasteners must be used
  - Wood is prone to shrinkage and warping
  - Wood cannot be painted or stained until completely dry
  - All of the above
- Species such as Southern Yellow Pine can be treated via \_\_\_\_\_, a color infusion process available for pressure-treated wood that makes it look like Cedar and does not fade like a stain.
  - Cedar-tone
  - Acetylation
  - Distressing
  - Penetrating oil-based stain
- \_\_\_\_\_ is a process that subjects a non-durable softwood to a vinegar-like solution, which turns it into a hardwood by preventing the cells in the wood from being able to absorb water.
  - Pressure treating
  - Cedar-tone
  - Acetylation
  - Distressing
  - Penetrating oil-based stain
- Cedar is naturally resistant to rot, decay, and insects with an expected service life of \_\_\_\_\_ or more years, making it ideal for outdoor applications.
  - 10
  - 15
  - 20
  - 25
- At The Lakehouse in Toronto, Reeves initially hoped to specify a metal roof but faced opposition from the project team because they felt \_\_\_\_\_ would work better with the style of the home, which ultimately proved to be the ideal solution.
  - Modified bitumen
  - Asphalt shingles
  - Cedar shingles
  - None of the above

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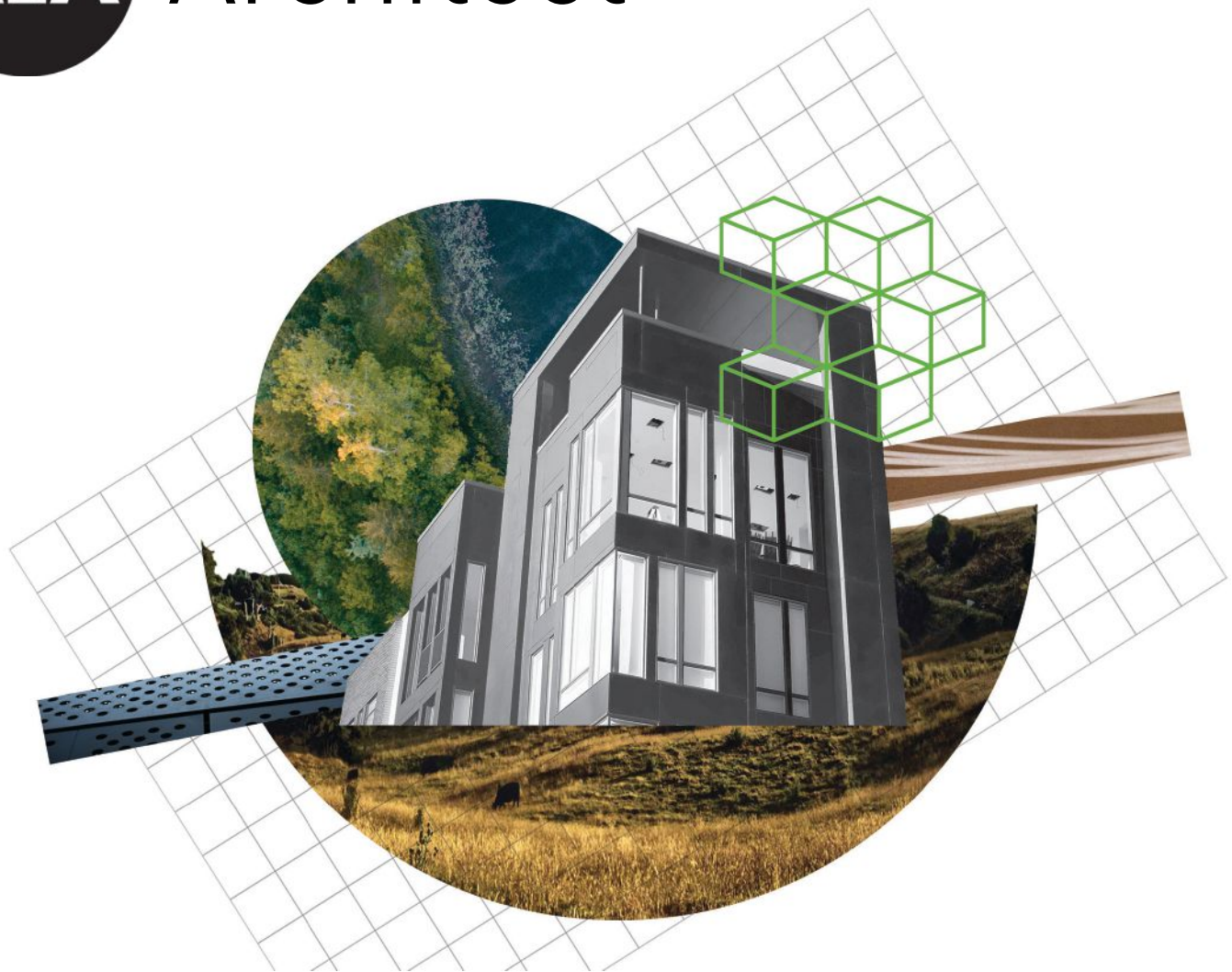
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# AIA Architect



CREDIT: RACHEL KAPISAK-JONES

# Cracking the Code

**Environmentally aligned building codes offer a pathway to protecting the planet.**

By Patrick Sisson

When the city of Seattle adopted its first building codes in the late 19th century, regulating material usage, height, and acceptable practices for city architecture, the relatively compact volume ran a neat 20 or so pages. Today’s code, which covers the minutiae and mechanics of the built

environment, may contain enough heft, more than 800 pages, to be assembled into a structure itself. The sprawling saga that is the city’s municipal zoning regulations adds another 1,400 pages.

“This means architects need to be more knowledgeable on a larger variety of

topics,” Seattle-based architect, urbanist, and writer Michael Eliason says of the complex code requirements of today. “But this specialized knowledge also drives up the cost and complexity of projects, so everyone does what’s prescriptive, instead of innovative.”

Building codes and regulations shape our cities in countless ways, distilling generations of development experience, best practices for safety, technological know-how, and, especially in the case of zoning laws, society's harmful, retrograde views on equity and equality. But as Eliason and many climate advocates argue, they're also a vital, if underappreciated, tool to drive innovation and fight climate change. Despite the size of modern building codes, there's still much work to be done to sync them with today's urgent climate goals.

Buildings currently represent roughly 39% of the country's emissions. Stricter codes can force a nascent generation of new buildings to be more energy efficient, sustainable, and healthy, and more aligned with larger environmental goals, like providing distributed renewable power or supporting electrical vehicle infrastructure. Model codes like ASHRAE 90.1, which governs commercial structure, and the International Energy Conservation Code (IECC), developed by the nonprofit International Code Council (ICC) and adopted by the majority of U.S. states and localities, need to evolve, says Daniel Bresette, executive director of the Environmental and Energy Study Institute (EESI).

"Buildings aren't just the gas stations of the future," says Bresette, referring to the growth of home vehicle charging. "We're increasingly going to be generating electricity on our roofs or taking advantage of geothermal resources. We'll be using our buildings differently 10 years from now."

Now may be an especially crucial time to advocate for and mandate a more environmentally aligned code, and not just because the increasing prevalence of extreme flooding, heat waves, building collapses, and wildfires suggests our built environment needs to be more resilient than ever.

The IECC, updated as part of a regular three-year cycle in 2021, will begin taking comments and feedback for the 2024 update this fall.

It's imperative to lock in energy savings and evolve building practices, now. Every new building currently lasts half a century, and retrofitting a building for clean energy is much more expensive than simply incorporating the technology during construction.

Cities and states subscribe to a patchwork of building regulations, with state law sometimes preempting local rules. But for the most part, U.S. codes lightly update or directly copy models created by the ICC.



FEMA research found that 10 million of the estimated 14 million U.S. buildings to be assembled between 2016 and 2040 will follow ICC codes.

The IECC update between 2018 and 2021 alone cut residential energy usage within a code-compliant building by 9%, and the sheer influence of these codes can save energy at great scale. RMI estimates that if codes mandated that 65 million newly constructed households install efficient electric heat pumps instead of gas heaters, the nation would save \$27 billion annually.

"There are things that are best done at the beginning, and the time to make a home energy efficient is when you build," Bresette says. "It's cheapest, you get the longest lasting measures, and it's the least invasive."

Jacob Corvidae, principal of the Carbon-Free Buildings Program at RMI, says there's always been fierce industry backlash toward stricter codes, due to the perception that they increase the cost of a new project (these complaints removed voluntary electrification standards from the 2021 IECC code). But if safer, healthier, and more efficient homes are the goal, sustainability, and switching to a renewable power system, should be the focus.

"There's no more extreme threat to our homes than the extreme weather caused by climate change," he says. "The truth is, what we need in a code most urgently is for buildings to all be electric."

The larger political challenges of updating building codes via standard-making bodies is well illustrated by the difficulty in protecting against the increasingly long and dangerous wildfire season. Kelly Pohl, an associate director and researcher at Headwaters Economics who has studied the structural damage caused by western wildfires, says climate-fueled disasters are already much worse than the pre-climate change standard, with multiple billion-dollar fires and weeks of poor air quality affecting the Western U.S. each year. Yet communities aren't codifying strategies to protect themselves via building codes that harden homes (replacing standard building materials with asphalt shingles and fiber-cement siding) and land-use regulations that discourage or ban construction in the most threatened areas.

A few misplaced assumptions stand in the way of these changes: There's a gut reaction that code mandates harm the personal liberty of property owners; there's a misperception about the cost of increased regulations; and hardening structures against future blazes; and finally, there's the perception that smaller local governments in rural areas don't have the capacity, budget, and manpower to properly enforce new rules.

Many communities start with voluntary measures, Pohl says, giving out checklists

# “Individual action isn’t enough to protect communities; we need collective action that can only be accomplished through regulation.”

and providing free home assessments to help property owners prepare for the worst. But the challenge of wildfire risk—and the larger climate risks we all face from inaction around cutting emissions—suggests collective action is the only true solution.

“If one home hardens and others don’t, the ones that don’t become hazards and great sources of embers and radiant heat,” says Pohl. “Individual action isn’t enough to protect communities; we need collective action that can only be accomplished through regulation.”

While regulation often gets stereotyped as manifesting itself in the form of delays, cost overruns, and hassle, it actually adds safety, stability, and certainty to building markets, Pohl says. Laying out clear rules of the road, such as materials, building strategies, and methodologies—as well as resiliency measures—gives builders, insurers, and communities more certainty around budgets and risk and makes it easier to

recover when the worst disasters happen.

Advocates for rewriting codes to reflect the latest innovations in resiliency and energy efficiency also say that adding these kinds of rules can actually push the industry forward.

“There’s a real push to say that we don’t want things to change fast, but that attitude is holding back the evolution of architecture and development,” says RMI’s Corvidae. “McKinsey did a study that showed the construction industry has had basically flat productivity for 70 years; it’s crazy that we simply haven’t gotten better at building in this country.”

Eliason, who spent years working on residential design overseas in Germany, agrees and often points out the wildly creative, diverse, and livable architecture coming out of Europe, which has much stricter energy mandates and building regulations than the United States does.

“The building process in the U.S.

doesn’t push innovation at all,” he says. “The whole ecosystem of how we do things in the U.S. is backwards.”

Copenhagen, now considered an exemplar of bicycle-friendly infrastructure, was once a ’60s city filled with car traffic and gridlock. In fact, many European cities and countries have rapidly upgraded their building codes and building stock in the last decade or so to reflect better building practices. Brussels, among the worst in the European Union in terms of building energy performance in 2010, used a carrot-and-stick approach of regulations and incentives to become a continental leader in energy-saving passive house construction within a decade.

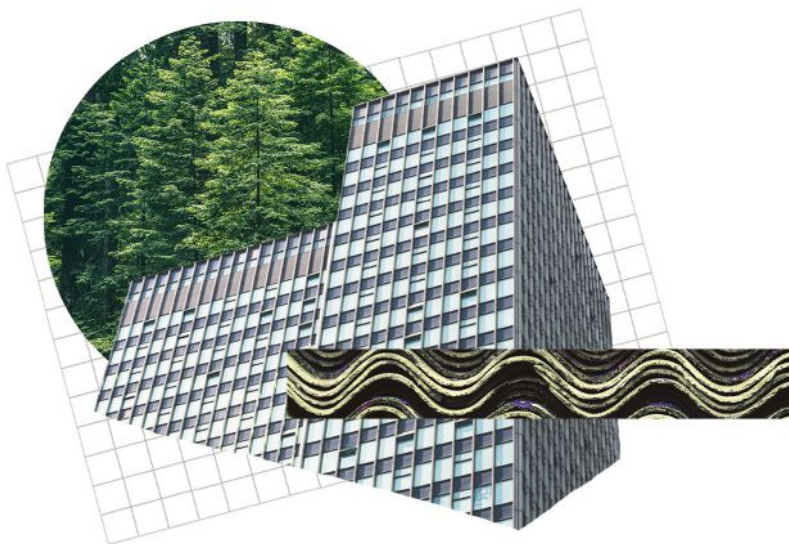
“They started encouraging this type of building, and very importantly, trained city staff and local contractors so they’d know how to build to these new standards, and now they’re building more passive house floor area than any other place on the globe except for China,” Eliason says.

Corvidae says the larger landscape for code evolution rests not only in updating international standards via the ICC but also in pushing for more progressive climate-focused codes and code amendments on the state level. RMI recently launched the Codes for Climate Initiative with the New Buildings Institute to provide a toolkit for local lawmakers to center carbon mitigation into new regulatory updates. California’s update to its own code in 2022 might mandate electrification statewide for all new buildings.

At a crucial moment when infrastructure investment is a key topic in Congress, climate-fueled natural disasters are on the rise, and building codes are set to be updated, EESI’s Bresette says that one of the best ways to push things forward is to boost training for code officials and inspectors. It’s one thing to have a great code, he says, another thing to have homes built to code, and even more importantly, to have those rules enforced.

The push for mandating building electrification, which has met fierce resistance from the fossil fuel industry, shows how hard entrenched interests may fight to prevent these changes. Corvidae says that pushback makes it all the more imperative that those in the building industry who understand these issues make it a priority to advocate for sustainable, and ultimately safer, homes.

“If we value providing not just a house but a home for people, then we’re failing in that duty if we’re not preparing for a ravaging sea of extreme weather events,” he says. **AIA**



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CREDIT: BRODY KUCHAR

# The Rebirth of Memphis' 100 N. Main

Memphis is drawing up new plans for its tallest skyscraper.

By Ben Schulman

In 1963, developer Harry Bloomfield broke ground on 100 N. Main St. in Memphis, Tenn. Bloomfield was a prodigious real estate magnate who, like his contemporaries across America, was busy reshaping cityscapes with the introduction of new forms and ideas. In 1955, he led the development of Memphis' Holiday Inn Towers, utilizing slip-form concrete construction for the first time in the world. Modernism was on the march, a mark of a city's progress, and Bloomfield was Memphis' messenger.

For 100 N. Main St., one of the city's most visible locations in the heart of its downtown, Bloomfield employed architect Robert Lee Hall and his eponymous firm, Robert Lee Hall & Associates Architects, to articulate his vision. Hall was an adept interpreter of Modernist principles, able to express the emerging vernacular of the age in design and detail. Hall had designed the Mid-South Coliseum, an indoor arena that, after opening in Memphis in 1963, would soon play host to The Beatles, as well as projects such as the starkly vertical concrete-and-glass Anthony Wayne Bank Tower in Fort Wayne, Ind.

Memphis in the late 1950s and early 1960s was experiencing an economic boom as it maintained its status as an inland cotton and lumber exchange while

accommodating a growing shift toward services. 100 N. Main was originally announced in 1962 as a 22-story development. Its ambition grew—first to 32, then to 37 stories. The skyscraper would open in 1965 as the tallest building in Memphis, as it remains to this day. The building was placed on the National Register of Historic Places in 2015.

Its intricate façade of precast concrete vertical fins is accented by white chip marble, and surprisingly, operable windows that provide depth to its otherwise smooth exterior. The building is supported on concrete pilings, allowing its reinforced concrete frame and floors to rise lightly, culminating with its space-age top that once contained a restaurant that rotated around completely every 90 minutes. “The Top of the 100” is actually 100 N. Main's “38th floor.” When it opened, it offered views of the Mississippi River, the city of Memphis and beyond, as well as the Japanese rock garden on the roof of the building's 37th story.

## A Building's Death

Memphis today is more diverse than the average U.S. city: According to the most recent census data, 64% of the city is African American. Additionally, almost

21% of the population lives below the poverty line. For this reason, buildings like 100 N. Main hold the keys to the city's upward trajectory in the next decade and beyond. A redevelopment project has the potential to serve a broad spectrum of the city, especially if it encourages MWBE participation and offers additional subsidies for those looking to start a business, as the city's Crosstown Concourse project did.

Downtown Memphis did not experience the urban growth that was anticipated in the late '50s and early '60s. The shockwaves of the assassination of Dr. Martin Luther King Jr. at the city's Lorraine Motel in 1968 spurred an exodus from downtown that decimated the area's population and property values, the reverberations of which still echo in the city's core today. Because of its proximity to city, county, and federal buildings, 100 N. Main continued to function for many years as a place for lawyers, doctors, and other professionals, even as maintenance on the property began to decline.

That decline was slow but steady. By 2012, approximately 30% of the building's space was occupied. By 2015, that number was zero.

Until recently, New York-based Townhouse Management Company (TMC) owned the structure. The company

announced various plans for the building's redevelopment, including a mixed 200-residential-unit and 550-hotel-room conversion. The hotel was to be branded as a Loew's property in anticipation of the \$200 million renovation of the close-by Renasant Convention Center. However, Loew's, citing additional development commitments in downtown Memphis, pulled out of any involvement in 100 N. Main's redevelopment in early 2019.

TMC unsuccessfully sued Loew's, attempting to get the company to honor its commitment to 100 N. Main. With no development plans or partners in place, and with the onset of the COVID pandemic, the building fell even further into disrepair. In March 2021, the Downtown Mobility Authority (DMA)—an affiliate of the Downtown Memphis Commission (DMC), tasked with spurring investment in the city's downtown—purchased the entire block on which the building sits for \$12 million.

### Life Again

"Within a 5-minute walk of [100 N. Main], there's \$438 million of property value, 700 hotel rooms, and 1,200 residents," says Brett Roler, the DMC's vice president of planning and development. Roler helped orchestrate the DMC's plan for the next phase of 100 N. Main's life.

In June, the DMC issued an RFP for the disposition and redevelopment of not only 100 N. Main and its 579,000 square feet of space (429,000 of which is rentable) but also nine adjacent parcels totaling over two acres. The neighboring properties include four historic, late 19th-century buildings, a surface parking lot, and a pocket dog park. Taken together, the RFP offers the opportunity to remake a significant swath of downtown Memphis.

Roler recognizes the monumental

task that comes with redeveloping one of Memphis' monuments. But he's also keenly aware of Memphis' ability to turn insurmountable projects into reimagined and revitalized places. "One of the things we believe at the DMC is that adaptive reuse and historic preservation is vital to creating neighborhoods that have authenticity and character," he says. "And one doesn't need to look far to see [adaptive reuse] projects like Sears Crosstown. We already do this."

Sears Crosstown, which is now known as Crosstown Concourse, is located about three miles east of 100 N. Main. Locals often refer to the 1927-era Art Deco building as "The Chrysler Building tipped on its side." All 1,500,000 square feet of the structure used to serve as a distribution and retail hub for Sears. By 1993, Sears had entirely left the building.

In 2010, a local arts organization, Crosstown Arts, was formed to realize visions around the redevelopment of the building, as well as build a hub for Memphis' creative community. What began as a grassroots effort rooted in arts-led revitalization culminated in the successful rehabilitation of the building with its reopening in 2017. It is now an activated vertical village—with a mix of restaurants, retail, theaters, residences, offices, artist and gallery spaces, and even a community radio station—that sees upwards of 3,000 people walk through its doors every day.

"When you think about the project as a whole and what we needed to happen to realize it, it was crushingly overwhelming," says Todd Richardson, the co-director of Crosstown Arts who led the redevelopment effort and currently leads the Crosstown Redevelopment Cooperative. "The only way to approach it was hour-by-hour and to break it down to its component parts, from curating tenants to financing to design—the

20 different things that all needed to line up," he says.

Richardson, an art history professor by trade, highlights the project's goal of achieving 25% MWBE participation on construction as an example of how its approach can be utilized on massive rehab projects. "What we ended up doing was breaking the project down to nine different projects," he says, noting how the scale then became approachable. The Crosstown project ended up with 32% MWBE participation.

Roler, with the DMC, is already thinking about how the mix of uses for 100 N. Main can mirror the sort of activity now present in Crosstown. "One of the goals is to have an 18-hour vibrancy on the site—to have mixed use where people are coming and going multiple times a day," he says. "Maybe it's a place to live and also a place to work. Maybe there are retail opportunities and also hospitality. But we need to bring in different types of people to the site as often as possible to create the street-level vibrancy that the site can really help us build."

The City of Memphis is ready to help make the deal pencil out, including making a commitment—if it works with the developer's vision—to lease out 60,000 square feet of office space as an anchor tenant, as well as providing an additional \$10 million subsidy through its Accelerate Memphis program to "facilitate catalytic community projects."

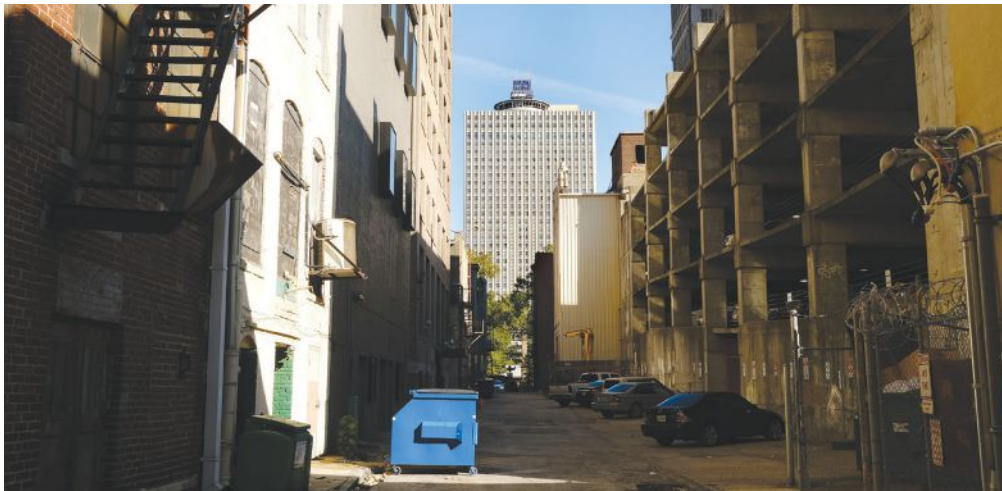
### The Future Is Now

The DMC has been creative in publicizing the RFP for 100 N. Main's redevelopment, touting a "Free Skyscraper!" in an op-ed and advertising campaign. Roler has led numerous parties on tours up the building. It's an urban explorer's dream to see the guts and, for now, faded glory of a prominent and imposing presence of architectural and urban might.

The DMC anticipates executing a developer agreement with the selected party by the end of 2021.

"Large skyscrapers get a bad rap," says Leah Fox-Greenberg, the chief executive officer of Memphis Heritage, a preservation advocacy organization. "For Memphis, this was our show of being a formidable city. It is a formidable building because it showed our strength on a pattern of growth. You just weren't a city until you had a 100 Main."

Luckily for Memphis and 100 Main's future development team, the city still has it. **AIA**





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## Robert Ivy, FAIA, On His Decade of Leadership

**Robert Ivy's tenure at the American Institute of Architects spanned a period of transformation.**

By Steve Cimino

At the end of 2021, Robert Ivy, FAIA, will say goodbye to the American Institute of Architects.

After a more than a decade of leadership, Ivy will retire as AIA's executive vice president and chief executive officer. The organization he's leaving behind is markedly different than the one he was called on to lead in February 2011: While the Great Recession and a global pandemic altered the world's economic and cultural landscape, the members of an increasingly diverse profession came of age and found their voices on social issues big and small.

The organization itself has changed: It is slimmer at the board level, as well as nimbler and more responsive to the critiques and concerns leveled by dues-paying architects. Some of these changes were timely and circumstantial, with AIA adapting to firm and member needs, but many of them were the work of Robert Ivy.

Below, Ivy—in his own words—describes his time at the helm of AIA and his thoughts on the institute he reshaped as he prepares for the next phase of his life.



*Ivy's plan was always to redesign AIA for the 21st century. The association was strong in 2011; it had been around since 1857 for a reason. But amid calls for a more equitable profession, for architecture and architects to embrace technology, and for AIA to support its members more effectively, he knew the organization had to adapt.*

*Now, in 2021, despite a very uncertain world, Ivy can confidently say that he's reinvigorated a place of connection and community for the next generation.*

When I returned to Mississippi after architectural school, the conversations we had about architecture revolved around our local [AIA] chapter. The chapter was the source of so much of our interest in, and our discussions about, architecture. And you were able to try things out. If you wanted to work on a project for the public good, you did that through the chapter. We renovated an old community building and literally got out there with jackhammers. I had never held a jackhammer until our chapter redid that fire station as a new community center for a neighborhood in Jackson, Miss.

It also put me in touch with other architects who have enriched my own knowledge and life. Among those were some who've gone on to be widely recognized. [AIA Gold Medal winner] Sam Mockbee, AIA, was an active member. I got to know him, in part, because of the chapter.

You also received something I recognized from day one: the benefit of the wisdom of the architects who had been practicing for a long time. I can remember the meetings I had with them, in their offices, where we got the lowdown on what it was like to make it through a hard time, or the professional optimism that it often takes to be an architect. I would call it both a living and learning experience.

*“Many of us ... are gratified to see that we're confronting—we hope—the last vestiges of exclusion as we push for a more inclusive and fully rounded, representative design community.”*

That formed the background tapestry of my practice life for the early part of my career. And it shaped my desire to expand opportunities, at AIA and across the profession, so that people interested in architecture could find their own togetherness and that experience of community. Among those of us who graduated from architecture school post-1960s, there was an open attitude about who we were and what our community should really consist of in an ideal way. And many of us have worked toward that goal and are gratified to see that we're confronting—we hope—the last vestiges of exclusion as we push for a more inclusive and fully rounded, representative design community.

*Though AIA is a nonpartisan organization, taking a stand on issues like climate change and racial justice goes beyond politics. Over the last half-decade, the association and its members have firmly shared their values with the design community and the world, standing for equity and human rights, for a sustainable future, and for architecture that emphasizes the resiliency of our built environment.*

*Ivy was at the forefront of that decision, understanding that silence is complicity and that architects are, by nature of their work, leaders in their communities. If there was ever a time in history to speak out and get involved, it's now.*

In 2016, we issued an advocacy letter that was widely misunderstood. It was a nonpartisan lobbying letter. But we very quickly recognized the need to make our values explicit. The board then issued a statement of values, intending for them to be clear to anyone who looked at AIA and asked, “What do we stand for?” Those values are still intact today.

At the same time, we began to address specific issues that were important to us as architects, as an association, for our time. The first one was immigration. We recognized that architects all over the country employ people from other parts of the globe, and they help make their offices prosperous and enrich the architecture that we produce. We went on to address many others, including climate and school safety; a variety of issues that really demanded clarifying in a public way.

All of that work, I am extremely proud of. But then we took it a step further. We collected those ideas and distilled them into a five-year strategic plan that highlights justice, that highlights equity, that highlights climate action. And a strategic plan leads to actions, it leads to budgets, and it leads to programs. The

good words that we all committed to have now been reflected in actual work for AIA, today and in the future. That is where the rubber meets the road. It's not just “what I think” but “what I do.”

In 2012, we were told by our advisers that people did not believe the organization to be bold and capable of taking strong positions. I can say today, as I am leaving, that we have taken strong positions. We are in a different place, in terms of our policy and our commitment, than we were before, and I am very proud of that.

*From a new, more functional web presence and the resizing of the board of directors to a massive, ongoing public awareness campaign, AIA has transformed in very visible ways over the last decade. That's because Ivy knew that talk is one thing and action is another; if he took charge but then only made tweaks around the edges, his members would notice. Architects are detailed-oriented, after all.*

*The results were major changes that potentially unnerved membership at first but led to a stronger, savvier, more responsive organization. A major remodel of AIA's headquarters is currently in the works, a final, physical testament to the work Ivy's done.*

Association work at the executive level is a balance between internal actions that the member will never, or rarely, see and then your more public positions. In pursuing the changes that began in 2012, many of them had to do with housekeeping and updating our systems to work more effectively. When it came to the association's digital transformation, I traveled around the country and talked to architects and chapters in town hall meetings. The one message I got over and over: We needed to up our game digitally. Not just with our website but with other products and services.

It took several changes to bring that about, but the decision made by the board was to completely transform our digital platform. And we have been engaged in that process ever since. Those sorts of changes to your internal infrastructure are not immediately visible to the member, but they become explicit. The website begins to look and act differently; your ability to renew your membership, receive newsletters, and sign up for events becomes more transparent and easier. They only make a difference to you, the member, when you need to execute something and realize it's a little smoother and better than it was before. That's a large part of what we do.

Then there are programs that make AIA notably more visible: the Blueprint

for Better awareness campaign, AIA's Film Challenge. And our advocacy efforts: These days, members of our large firms regularly fly into Washington to lobby members of Congress, and we have efforts underway not just at the federal but at the state and local level. We've had some real wins on favorable tax legislation, on getting language around climate change into executive orders and pending legislation. Sometimes our initiatives start behind-the-scenes and end up making a real, notable difference.

*As December draws closer, reality is setting in for Ivy: His time as the leader of AIA is almost over. But what a ride it's been; he's been able to successfully lead the organization through a remarkable period of upheaval and can*

*confidently say that it's come out stronger on the other side.*

*Ivy hopes to possibly write another book, to serve on several boards, and even to teach. And of course, he'll keep tabs on AIA, confident that it will continue to evolve with the times and serve its architects' needs.*

What you become aware of very quickly when you start a job like this is that you're not a corporate CEO who can go in and set a whole new direction. "We're going to take that hill." It doesn't work like that. This is really a stewardship of a body of values and of people who want to make positive change in the world.

It's been my view, throughout the last number of years, that the association

is really a large network of people with shared interests. It's less an institution or a bureaucracy than a connected network of people who want to be and choose to be connected to each other. Part of the trick is discerning where they as a group are, listening to them, and trying to synthesize their hopes, dreams, and ideals into words and direction for the future.

That's the job of AIA's CEO: not to make pronouncements but rather to discern people's collective vision. For themselves, for their work, for their ability to change and make change in the world. And to succeed. Someone who can get all those elements to coalesce: That's how I'd define a successful leader of this association. **AIA**

## AIA PERSPECTIVE

# Converting Talk to Action

**Architects and mayors are ideal partners to invest in the future of cities and towns.**

By Peter Exley, FAIA, 2021 AIA President

AIA has a history with American mayors. What keeps them up at night are not inevitabilities they're merely anticipating—rather, what keeps them up are real choices that have profound consequences.

Earlier this month, I was to represent AIA in the U.S. Conference of Mayors (USCM) in Austin at a meeting that was canceled due to COVID. It's been a tough year for mayors, to say the least. When we talk about cities tackling challenges "head-on," I don't think we realize that often it comes down to one person acting on the best intelligence and advice of their municipal teams. I also don't think we fully realize what accountability means until we consider the responsibility of mayors.

Over the last few years, AIA has been cultivating relationships with mayors in every part of the country. Shirley C. Franklin, the former mayor of Atlanta, currently serves on AIA's Board of Directors. Her rock-solid ethics, zeal for transparency in the public process, and long-term infrastructure investments were boons for the city. A few years ago, I worked with then-Mayor of South Bend Pete Buttigieg, who at the time had been receiving a lot of flack for upgrading the city's infrastructure, which will pay dividends for generations. If he had just focused on policing and public safety, he might have had more fans. But,

he was committed to re-creating a city that had been decimated 60 years ago with Studebaker's departure. If you talk to Mayor Nan Whaley of Dayton, Ohio, she will tell you about the importance of school safety as an investment and a virtue. When you talk to former Oklahoma City Mayor Mick Cornett, he will tell you that cities with low standards will not attract businesses with high standards—and there is no greater standard than the city's quality of life.

My message to mayors, which I intend to deliver in alternate ways, is: You need architects to build better projects if you want to remain relevant and prosperous. Equitable design shapes our citizenry. Climate action will save our cities.

My message to them is also supported by evidence. Look at South Bend, Detroit, Pittsburgh, and Atlanta for four dramatic examples of transformation half a century after we all thought their stories were set in stone. Each one of those narratives requires an architect's thinking; each one of those cities was made better and more prosperous because of architects.

The narratives of cities and towns, big or small, are always being written. In those narratives, the architect's role is unchanging: What architects do is create places where people live their lives, and where people experience the things that

make us happy and help us learn and find fulfillment. There's the physical infrastructure of roads and bridges—all of which define a community's capacity to make the most of its future. There's also the vertical infrastructure of affordable housing, museums, schools, and hospitals—all of which define the promise of a civil society, as I've said on numerous occasions.

More fundamental and, to my mind, elemental is the opportunity to make cities more equitable, which creates an organizing logic from which everything else may grow. Let's talk about bridges, but let's also talk about connectivity and access for disenfranchised neighborhoods. Let's talk about affordable housing, but let's also talk about ensuring the things that support residential life like sanitation, well-maintained parks, nearby grocers who sell fresh produce, clinical healthcare, and safe schools.

Where architects and mayors are aligned is on converting talk to action, which makes them ideal partners. **AIA**



CREDIT: RUTH YARO



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# What Makes Architecture Excellent?

2021 AIA COTE Top Ten Awards winner, Massachusetts Institute of Technology, Cambridge, Mass., designed by HGA. The project team considered more than 300 energy-saving ideas for the state-of-the-art research facility.

TEXT BY TERRI PETERS  
EDITED BY WANDA LAU

A photograph of a modern building's exterior, featuring a long, continuous wall of large glass windows. The windows are framed by light-colored, possibly white or light grey, horizontal and vertical mullions. The glass reflects the surrounding environment, which is filled with lush green trees and foliage. The lighting is bright, suggesting a sunny day, and the overall atmosphere is clean and contemporary. The text 'Prioritizing People, Place, and Purpose' is overlaid in white on the lower-left portion of the image.

Prioritizing  
People,  
Place,  
and Purpose

What makes a building great? A query for examples of “great architecture” will certainly return a list of beautiful objects and forms. But beyond a privileged few, whom have those projects served—and how much does that matter?

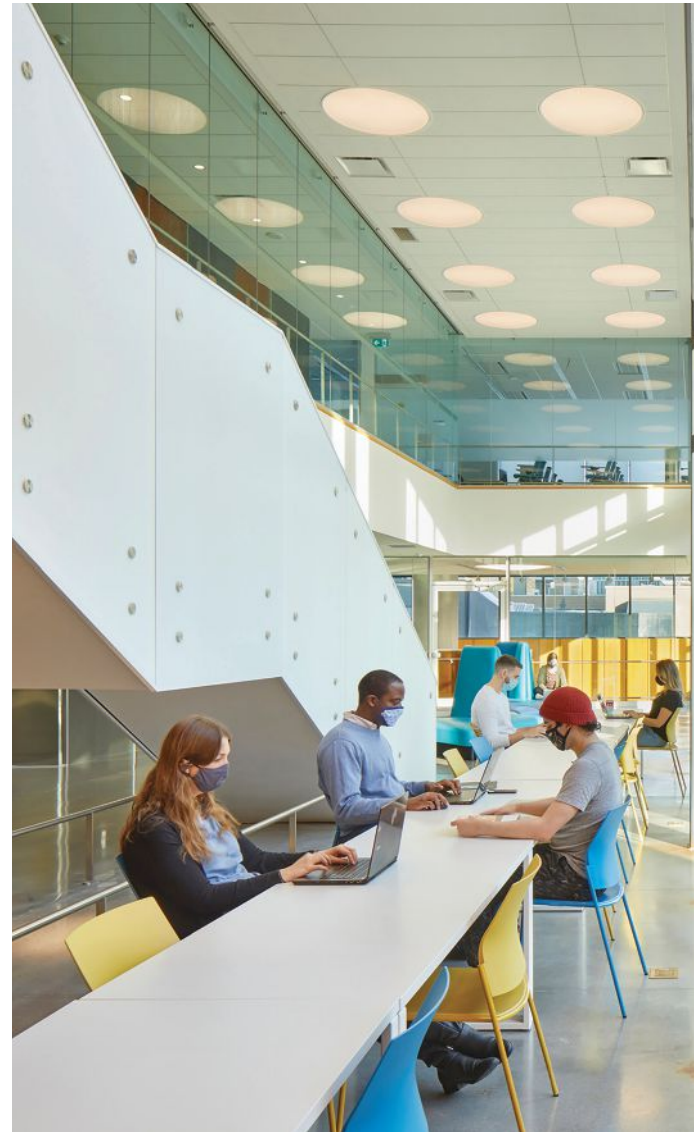
For many design professionals, architecture is more than the final product. It is a language, a process of creating spaces for people, and a representation of what we value as a culture. What is good and appropriate in one context may not work in another. Though defining design excellence can be like “asking the meaning of life,” says Marlon Blackwell, FAIA, describing it is possible: “Good architecture is resolute. [It has] resolution in the scale of the site and the building, and in the hand or detail.”

Successful design also maximizes the positive impacts of a context and makes something that works and is loved. “Scale and proportion don’t cost anything,” continues Blackwell, the principal of his eponymous firm in Fayetteville, Ark. “It is about economy of means for a maximum of meaning.”

## Embracing the Potential of Good Design

By now, many, if not most, architects would agree that environmental performance is a collective and urgent priority, particularly as the effects of climate change acutely manifest around us. This summer is yet another one of the hottest on record, and wildfires and extreme temperature swings are recurring news stories.

Beyond energy use intensities, attention to factors such as the health and experience of people in and around a building is becoming more prevalent. Increasingly, architects are acknowledging community engagement, resilience, and social justice as project performance criteria. At the same time, formal certification programs such as the Living Building Challenge, Declare, Fitwel, WELL Building Standard, and Social Economic Environmental Design have emerged. The U.S. Green Building Council has evolved



2021 AIA COTE Top Ten winner Ryerson University Daphne Cockwell Health Sciences Complex, Toronto, designed by Perkins&Will. Teaching, research, and living spaces fill the 28-story “vertical campus,” which features a ground-level pedestrian corridor, rooftop urban farm, and event venue for the public.



LEED, the first mainstream green building rating system, to meet market demand for not only energy efficiency but also bigger-picture thinking via LEED for Neighborhood Development and LEED for Cities and Communities. WELL, a complementary rating system to LEED, focuses on evaluating occupant experience, which has a clear cost value to companies in the forms of staff turnover, productivity, and job satisfaction.

Some architects (and clients) think they know good design when they see it, and that they don't need another checklist for evaluating design. But sensory experiences—like the textures of materials, quality of light, privacy and noise, connection to nature, and integration with a community—are critical to a building's success. These aspects are hard to detail and compare. "You manage what you measure" holds truth in design, but without explicit attention to the impact of architecture on health, well-being, social equity, and community fabric, these factors could get lost.

## A Framework for Excellence

Recognizing that architecture goes beyond aesthetics and site boundaries, The American Institute of Architects, in 2019, adopted its Committee on the Environment's (COTE's) Framework for Design Excellence as relevant to projects "regardless of size, typology, or aspiration," according to its website. The rubric comprises 10 principles that define "good design in the 21st century." Quantitative aspects—energy, water, economy, resources, and ecosystems—are paired with qualitative aspects vital to the building's story—integration, equitable communities, well-being, change, and discovery.

Since 1997, COTE has honored projects that best meet these values through its Top Ten Awards program, whose winner archive provides a record of building data and an annual snapshot of our profession's potential. The program is open to recently built projects across all typologies and climate zones to establish a wide spectrum of what constitutes sustainable design excellence. "It is intentional," says Mary Ann Lazarus, FAIA, a St. Louis-based sustainability consultant at Cameron MacAllister Group and a past COTE awards juror. "There is something in the winners that can inspire almost all of us as we do different kinds of work."

Entrants are encouraged to submit post-occupancy project data along with documentation of community engagement, energy savings, connection to occupant health and well-being, and support of the AIA 2030 Commitment, among other parameters. While the juries do seek projects that demonstrate conventional design qualities, like aesthetics, they also have to determine if projects adopted or exceeded best practices in sustainable design—a bar that continues to rise as technology and design priorities evolve.

"Performance needs to be integrated," says Blackwell, who juried this year's COTE awards. During his review, he searched for projects that used common-sense passive-design strategies. "Otherwise, it leads with its chin," he says. "It is more about environmentalism than environment."

"Some aspects are easier to measure and compare, like energy use or Walk Score numbers," says Michelle Amt, AIA, who chaired the 2021 jury and is also the Charlottesville, Va.-based director of sustainability for VMDO. Harder to assess is "how did the community benefit from the design? Because community means different things. For some [design aspects], the metrics aren't there yet."

## Reworking Design Strategies

Many architects are beginning to communicate the broader value and benefits of holistic design and planning to their clients. Government financial incentives—like tax credits offered to the private sector for LEED certification—help, but designers can also reframe their clients' notion of the bottom line. Developers are largely motivated by monetary returns on investment, but what if architects could better describe the economic gains from investing in people, neighborhoods, and well-being for lasting value?

Higher education institutions have embraced the long game. They expect capital investments to last 50 to 75 years minimum, Lazarus says. High-performance campus buildings become showcases for faculty and student recruitment and integral to the brand of the institution, cementing its role as a sustainability and knowledge leader. During the early stages of design, university clients are more likely to engage students in the data collection process and publish post-occupancy data. Their willingness to study and share the process and product of their designs is an important next step in increasing data transparency, establishing realistic expectations, educating other clients, and encouraging more higher performing buildings.

Perhaps the fact that six of this year's COTE Top Ten Awards went to university and college projects then comes as little surprise. However, other common building types—K-12 schools, multifamily housing, community centers, offices, and retail stores—did not manage a spot in the winner's circle. These background buildings, which constitute the majority of our stock, should also be inspiring, functional, and worth updating. Blackwell cites the dogtrot house as exemplifying inherent potential for excellence: "The typology is modest, yet beautifully conceived, shades, and brings in air and breezes."

More complex programs, such as affordable housing and adaptive reuse, can also pursue this expanded





*Left: 2021 AIA COTE Top Ten winner Civitas, Memphis, Tenn., designed by Archimania. Certified as LEED Platinum and Zero Energy and Zero Carbon certified by the International Living Future Institute, the single-family residence offers a prototype of carbon-neutral housing in hot and humid climates.*

*Opposite page: 2021 AIA COTE Top Ten winner University of Washington Life Sciences Building, Seattle, designed by Perkins&Will. Photovoltaic cells in vertical solar fins generate enough electricity to power the building's office lighting.*

notion of design excellence. “There are a lot of everyday buildings that we have to seize their potential, like abandoned strip malls and big box stores,” Lazarus says. “We can’t always demolish and rebuild, or all of that embodied carbon has gone to waste.”

## Repositioning the Narrative

Architects can change the value question of building performance to help clients not just focus on how much more they have to do, intervene, or pay, but also on building habitation, strengthening community, and improving the health of people and the planet, says Anne Schopf, FAIA, a partner at Seattle-based Mahlum Architects, whose Rainer Beach Clinic, also in Seattle, won a 2021 COTE award. And architects sometimes will

need to hand over control to more convincing parties, such as community collaborators and stakeholders.

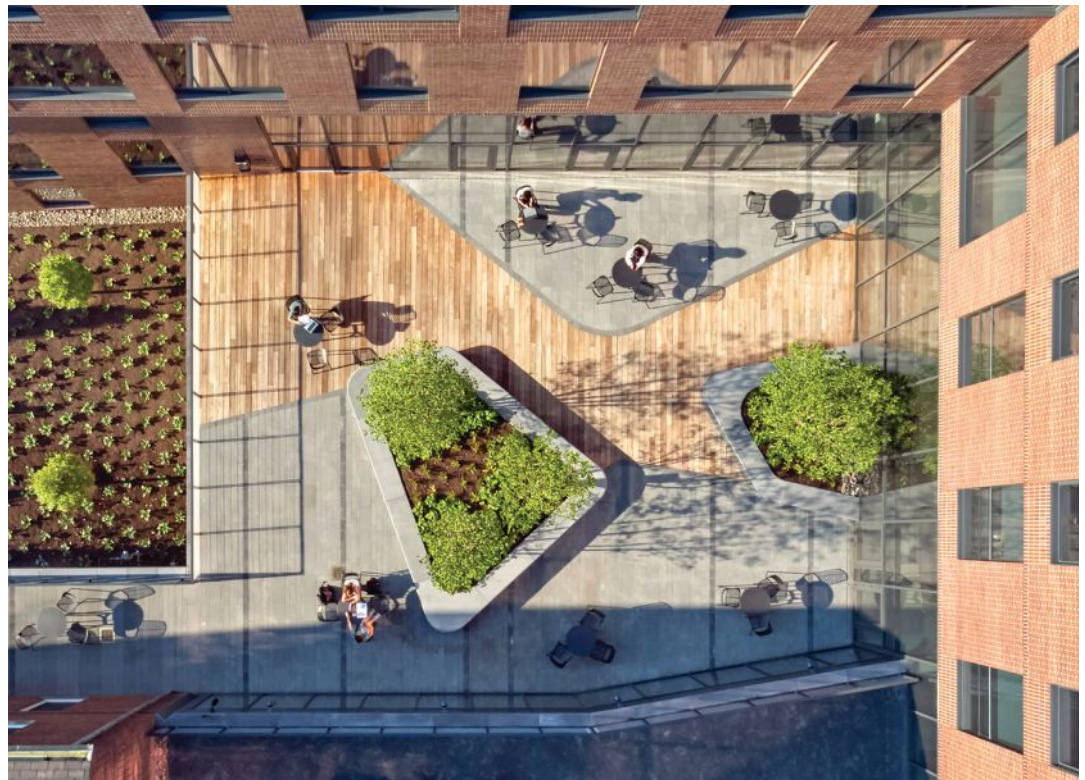
Schopf cites the example of Shelley Halstead, founder and executive director of Black Women Build-Baltimore, an organization that supports home ownership and wealth-building in Black communities by training Black women in carpentry, electrical work, and plumbing as they restore vacant and dilapidated houses in West Baltimore. During her keynote presentation at this year’s AIA Conference on Architecture, “Halstead talked about her projects that radically re-inhabit neighbourhoods, creating real dignity and quality spaces for people who are ... urban pioneers, making new homes in vacant houses,” Schopf says. Halstead, a master carpenter who briefly





*Above:* 2021 AIA COTE Top Ten winner Arizona State University Hayden Library Reinvention, Tempe, Ariz., designed by Ayers Saint Gross. The project preserved 95% of the existing opaque envelope and structural system and added all-gender restrooms, wellness and lactation rooms, an interfaith reflection room, and an ablution room.

*Right:* 2021 AIA COTE Top Ten winner Lafayette College Rockwell Integrated Sciences Center, Easton, Pa., designed by Payette Architects. Landscape spaces, green roofs, and an outdoor classroom draw students to the former hardscape site.



practiced law before returning to the craft, convinces her investors and apprentices to find value in building neighborhoods and upskilling people when the benefits are not immediate or guaranteed. Can architects be as clairvoyant and compelling?

The pursuit of design excellence comes with significant responsibility. Erica Cochran Hameen, ASSOC. AIA, a 2021 COTE juror and assistant professor at the Carnegie Mellon University School of Architecture, tells her students that architects should design for longevity: “Houses, hospitals, schools, places of worship—these are buildings not just made for one client or one person, but for whole communities and for generations.”

## Redefining Value

So how should architects describe or calculate what clients invariably request: project payback? “Some things don’t really ‘pay back’ like others,” Amt says. “For example, research into material chemistry may be important at a certain stage of a project, but if there’s no budget and no time, sometimes people just fall back on what they know.”

When something does add value, the manner and approach with which designers convey that value can determine next steps. Cochran Hameen believes the profession is shifting the conversation from hard numbers to explaining project impact such that all team members and user groups know what is at stake. “We can’t always talk about kilowatt-hours or metric tons of carbon with clients,” she says. “We have to make clear what kinds of outcomes our decisions can have—for example, this design option or process will [result in] similar carbon savings or impact as planting 100 trees.”

Being strategic about which design aspects to highlight is also key, Cochran Hameen says: “[For school projects,] explaining published studies ... where certain environmental qualities are shown to improve test scores or, for offices, how good indoor air quality can improve employee satisfaction or reduce worker sick days [may resonate more with clients].” Metrics and data matter, but architects must also interpret and give context about why they are important.

Schopf connects the notion of project value and objectives with design excellence. “In every project, you’re trying to meet discrete and sustainable goals,” she says, “and design excellence can be seen as the elegance of the solution.”

## Future Forward

Though the uptick in the number of architecture firms signing the AIA 2030 Commitment is encouraging, environmental performance is only one aspect of design excellence; it alone cannot change things when

# Q+A:

## Bryan C. Lee Jr. Links Design Justice to Architecture

*To explore the role of justice and social advocacy in architecture and placemaking, Terri Peters interviewed Bryan C. Lee Jr., the New Orleans-based design principal of Colloqate and a co-organizer of the national platform Design as Protest.*

### **Peters: How do you compare design justice to the conventional notion of building design?**

*Lee:* Design justice is a foundational principle; it is not a design process, yet. It is an underlying framework for how to think about getting to the architecture. The principal argument of design justice is that we are creating spaces of racial, social, and cultural justice through the process and outcomes of design.

Complementing that notion is that design justice seeks to challenge the privilege and power structures that use architecture as a tool of oppression. It is people- and justice-focused. It seeks to create radical visions for what living in space with one another means. In the next five to 10 years, we’ll start to see the aesthetic correlation between design justice and what we call colloquial architecture—just like you saw the change in the aesthetics of place as a byproduct of the environmental movement 20 to 30 years ago.

### **How can the profession become more equitable?**

The design profession changes when those who presently control the capital change the demands on designers so that it's no longer purely about capital return on investment, but a social and justice-based return on investment. So, are we doing work that materially changes the lives of the community members when we introduce our buildings into these places?

Fundamentally, where you're seeing the biggest changes is in institutional frameworks or at institutions that are beholden to a constituency: public schools, colleges, and libraries in progressive spaces. They're all putting out requests for proposals that are either ticking toward equity frameworks or pushing it further into critical race theory and design-justice frameworks. The outputs of design justice are not only to repair for past injustices of the physical environment, but to make them fair in the present and remove barriers for the future.

And then, if we want to push design justice one more step forward, it requires us to affirmatively influence the future outcomes of those who have been marginalized by not only our architecture but also previous architectures and frameworks that have fundamentally harmed people.

### **How will we know when we have achieved equality for all in the built environment?**

As a nonprofit, Colloqate tries to choose clients who will become partners. We are less viewed as tools of a client and more as partners in a set of actions, which gives us more liability and responsibility. But the client also has the opportunity to reduce their overall decision-making in the process—or to redistribute it to the communities that are going to be served in the space.

Ultimately, we move forward by making sure that people who act with malice and violence in the physical environment don't get to keep

building things when they cause harm. Architects need to call out such clients so that they don't control every aspect of the physical environment.

There are clients, like institutions or people that have an obligation to a large set of constituents, that are enthusiastic about making sure different voices are structurally implemented into design in real, functional, and strategic ways.

**“The design profession changes when those who presently control the capital change the demands on designers ...”**

—Bryan C. Lee Jr., Colloqate founder and design activist

### **Will that require ongoing consultation and reflection with occupants as our buildings, clients, or client needs change over time?**

We prioritize the needs and wants of communities over the needs of clients. That is a prerequisite of our entering into a contract. You have to be willing to serve your community above all other things. To do that, you have to acknowledge that a pre-design organizing engagement happens prior to the standard scope of project services, and continuing post-occupancy studies are necessary.

The beginning phase is establishing the buy-in, the investment, and the connection to the community. What better way is there to build community than to have people invested in the spaces that are coming into those neighborhoods? We ask to be a part of community conversations and engagements early on. We hire community members to be a part of the design team to help those conversations move forward. Fundamentally, we try to assure that the follow-through happens through spatial applications into the design process, the standard scope of services, and then construction.

### **For architects wanting to do projects that support change, what kind of architecture would actively dismantle barriers and make buildings more equitable?**

When we talk about design justice, a random person will sometimes comment online, “Architecture can't change anything, so you all should focus on other things.” Or “architecture is not significant enough to do that.” But then I remind people that 40% of the carbon emissions that exist in this world are a byproduct of buildings. And [two-thirds of the global population] are expected to live in urban environments [by 2050].

If we have that much additional square footage going up, then we're going to continue to be one of the biggest contributors to climate change. And the impact will hit Black and brown people hardest.

It is also a racial justice issue. From the 1970s to around 2010, [the number of people imprisoned increased by approximately 700%]. That means that we're building more prisons to lock more people up. You can't tell me that's not an architectural issue. You can't say that because we have housing policies that reduce density, spread people out, and bifurcate communities. There are houses that get developed and designed to harm the consistency and continuity of

communities. You can't tell me that's not an architectural issue.

For nearly every injustice in this world, there's an architecture, a plan, a design that has been built to sustain it. Our job is to suss that out, and that means challenging systems that create the same sets of output.

**We can measure parameters like carbon emissions and environmental impact. It's harder to measure the impact of design decisions or equitable initiatives. Is it important to measure design justice like we do for other performance aspects?**

It is 1,000% important to measure it. It is necessary to understand the qualitative metrics of place that define people's relationship with place as it exists and as it might exist in the future. Carbon is easy to measure now, but that's only because people put a lot of effort into understanding how to measure carbon. We have done none of that when it comes to understanding race and people—literally none of that. We always throw our hands up and say, "Well, it is just too hard to measure this."

But people are not that complicated. Our patterns are similar. Biased systems—that's sexism, racism, religious bias, gender bias, ableness bias—are forced upon intersectional communities on a daily basis. We have to adjust our lives. We have to adjust how we make decisions. And that can be tracked and talked through with communities and start a larger database of understanding about how people move in place.

The reason that people [are comfortable measuring] carbon is because it doesn't have a personality. It's easier for people to dismiss the human quality or the human nature of design, which is the most crucial. And that's the most juicy stuff. It tells so many stories, and it can tell us about the longevity of a building just based on how people care for that building.

almost everything needs to change—or at minimum be updated—in professional practice. Firms can advertise their number of LEED Accredited Professionals and their energy modelers' software expertise, but can they train their designers to speak and engage with skeptical developers or wary community members in disenfranchised neighborhoods?

Greater expectations are being placed on architects than ever before, Lazarus says, and the skills and knowledge they need to bring to projects are rapidly increasing. But this is a good thing. "We need to own the responsibility," she says. "This means having a deeper knowledge of things like embodied carbon or social justice and equity, and knowing when to bring in collaborators and, at the very least, what questions to ask."

The profession needs to continually ask what defines beauty and delight in our communities—to whom and by whom? Who gets to experience inspiring design without being scrutinized or ushered away? Should a classically beautiful project with a lavish budget get more accolades than a modest project with a strapped budget in an underserved community?

In the face of coinciding and substantial environmental and social crises, these are the questions architects must answer in their pursuit of design excellence moving forward. Architects who can fold long-term impacts on community and social value into their vision in an authentic and impassioned manner will likely find themselves positioned to create projects that can improve the lives of more than the exclusive few.



2021 AIA COTE Top Ten winner Rainier Beach Clinic, Seattle, designed by Mahlum Architects. Serving nearly 100 kidney dialysis patients who live within 1 mile of the site, the project restores the natural ecosystem of the site, formerly a scrapyard. Every patient dialysis room receives plentiful daylight and looks out to native landscapes and seasonal plantings. The project's post-occupancy evaluation survey for visitors and staff was translated and offered in seven languages.

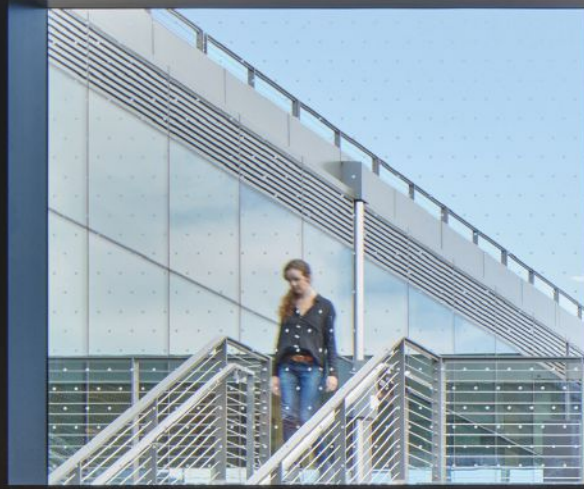
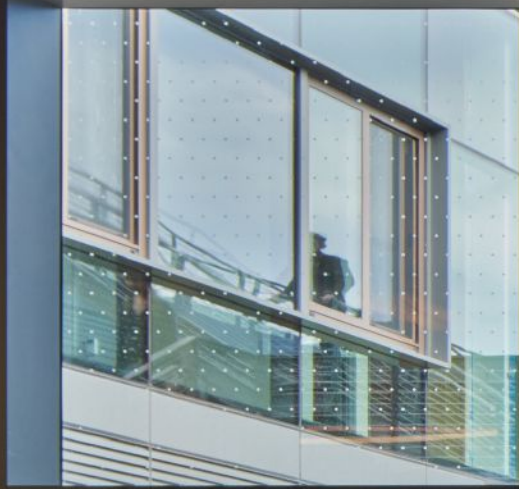


Ryerson University DCHSC's podium roof at level eight hosts an urban farm, which, combined with high albedo paving and roof membranes, reduces urban heat island effect—a marked improvement from the site's prior use as a surface parking lot. The project deploys bird-safe glass with a highly visible frit pattern for all glazing within 30 feet of grade- or upper-level planted surfaces; the extensive use of glazing also strengthens the connection between indoor and outdoor spaces.






2021 AIA COTE Top Ten winner Market One, Des Moines, Iowa, designed by Neumann Monson Architects. The adaptive reuse turns a 1901 manufacturing facility into a LEED Platinum–certified commercial office building, while preserving nearly 98% of the existing building and materials. Photovoltaic panels on the roof and a solar canopy over a nearby surface parking lot provide more than a third of the building’s energy load, which is further reduced by the project’s geothermal system.



2021 AIA COTE Top Ten winner Microsoft Silicon Valley Campus, Mountain View, Calif., designed by WRNS Studio. The renovated and expanded 643,000-square-foot project features an occupiable living roof and a series of courtyards that ensure every desk is within 25 feet of nature. Located in a drought-ridden region, the project includes water-management strategies that help support a natural habitat and public trail beyond the site.

A photograph of a modern office interior. In the foreground, a person with short dark hair, wearing a blue and brown plaid shirt, is seated at a light-colored wooden desk, viewed from behind. They are looking at a computer monitor. The desk is equipped with a keyboard and a mouse. To the right, there is a white office chair and a desk with a computer monitor. The office is characterized by large windows that offer a view of a building's exterior, featuring a complex structure of metal beams and glass panels. A person is visible standing on a balcony or walkway outside. The interior has a high ceiling with exposed wooden beams and a modern, minimalist aesthetic.

“Good architecture is resolute. [It has] resolution in the scale of the site and the building, and in the hand or detail.”

—Marlon Blackwell, FAIA, 2021 AIA COTE Top Ten Awards juror and principal, Marlon Blackwell Architects

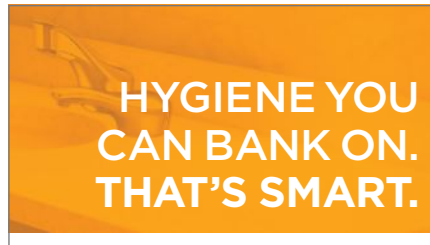


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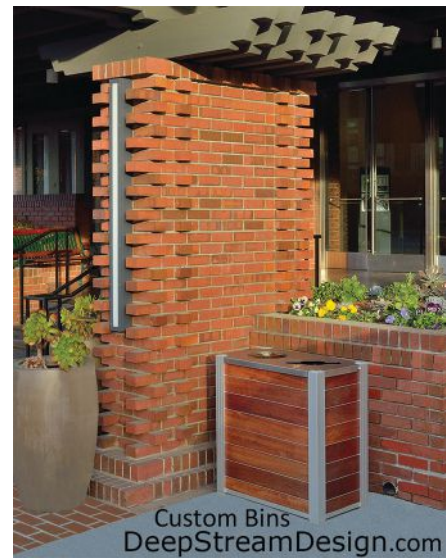
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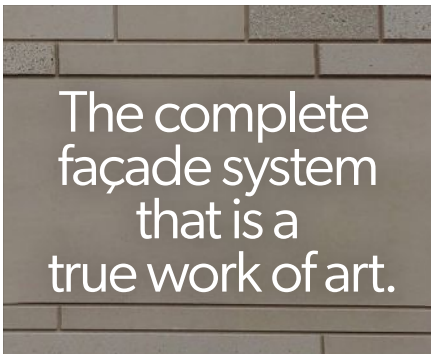


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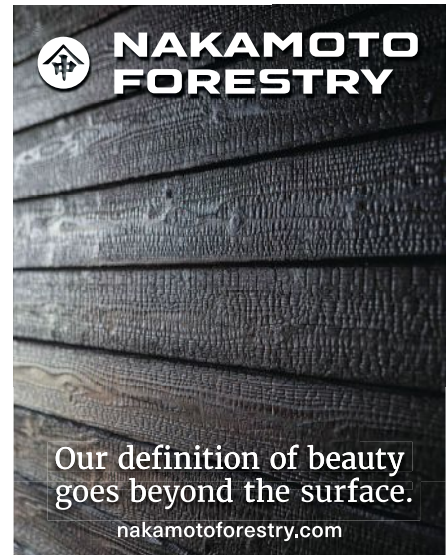


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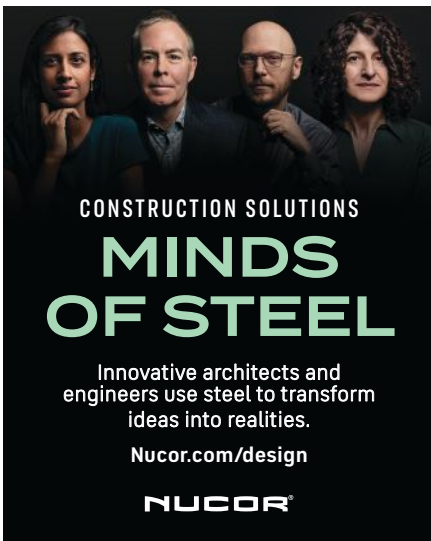


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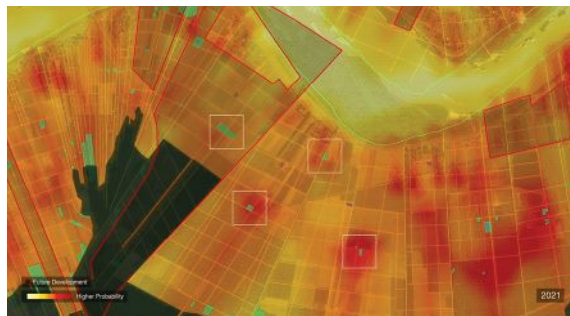
# Editorial: Environmental Justice

TEXT BY PAUL MAKOVSKY

Architecture has the power to create and build communities that bring people together, offering another aspiration to the challenges already facing the profession. Forensic Architecture, a London-based research agency comprising architects, archaeologists, and journalists, is pushing the boundaries of how designers can change the way we look at the built environment. The organization, which is led by architect Eyal Weizman, has investigated human rights violations, including violence committed by states, police forces, and corporations, and uses pioneering techniques in visual and spatial analysis. Collaboration is key, and its outcomes are eye-opening.

One of Forensic Architecture's recent projects is on display at the *Cloud Studies* exhibition at the Whitworth Gallery in Manchester, England. Its study maps the toxic legacy of chemical plants built on plantation graves of enslaved people in a Louisiana region known to locals as "Death Alley." Residents of the majority Black communities that border these plants breathe some of the most toxic air in the country and suffer from some of the highest rates of cancer, COVID-19 fatalities, and other serious illnesses. Forensic Architecture has used advanced techniques in mapping and fluid dynamics—simulating the flow of gases and liquids—to help support efforts by local community activists such as Rise St. James, which has been fighting the construction of a new plastics facility in the region. The research exposes how these petrochemical companies not only continue to release lethal airborne pollutants but also build in the footprints of sugarcane plantations—becoming a case study in environmental racism.

Importantly, the work includes a search for traces of erased Black cemeteries of the historically enslaved buried in these plantation grounds. Under Louisiana state law, cemeteries have perpetual protected status, so the residents are in a race against time to develop a strategy for finding hundreds of missing cemeteries. Working with local activists, Forensic Architecture mobilized tools such as property surveys,



Forensic Architecture is investigating the environmental racism in an 85-mile stretch of land along the Mississippi River once known as Plantation Country but today known as Death Alley. The project team has identified anomalies that point to the existence of cemeteries for the historically enslaved Black community of several plantations on the site of a proposed industrial complex.

aerial photographs, architectural drawings, and archaeological reports to study the evolution of the plantations and identify hundreds of sites that hold historical and cultural value.

Identifying and preserving these burial sites is a way to memorialize the enslaved Black people who built Louisiana's economy. It also raises awareness of the connection between present-day structural racism and the history of wealth. The result is historic preservation tied to environmental justice. Rise St. James is looking for a form of ecological reparations that sets a moratorium on industrial development, gives the local community agency over how these lands are stewarded, and demands the petrochemical companies clean and restore the natural environment.

Addressing environmental injustice and racism requires accountability, collaboration, and reflection. The architecture profession can be a key player in ensuring that our built environment shifts from one that spurs extraction and waste to one that fosters sustainable, cooperative, and regenerative processes, where we can live harmoniously with each other and the land.

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Jayshree Shah, Architect

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