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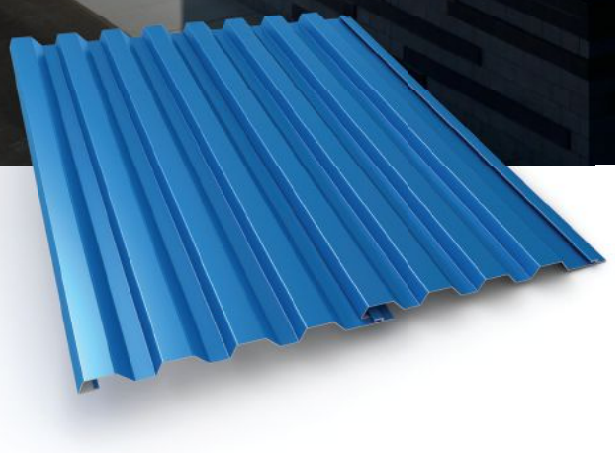

Doris M. Reed Elementary School, Las Vegas Contractor: Andy Russo Jr. Inc. Architect: Gensler & Assoc. GC: Martin Harris Construction Owner: Clark County School District Photo: alanblakely.com

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Contents

Volume 109, number 08. August 2020.
On the cover: 2019 NOMA Pittsburgh Project Pipeline camp; photo by Volcy Photography.
Below: 2018 NOMA Louisiana Project Pipeline camp; photo by Chris Daemmrich. 2020 NOMA Foundation Fellow Barbara Nasila; photo by Dawit N.M.

What Does Real Action Look Like?

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Born out of the Civil Rights Movement, the National Organization of Minority Architects (NOMA) was formed for the purpose of minimizing the effect of racism on our profession.

At this critical time, **we must all leverage our positions of privilege to foster justice and equity in communities of color** through outreach, community advocacy, professional development, and design excellence.

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Super Mario

The Tappan Zee Bridge, revolutionary in its day, was well past the end of its operational life. Replacing it with the new **Governor Mario M. Cuomo Bridge**, a span of more than three miles across the Hudson River, required erecting a structurally complex cable-stayed design with careful attention to the river ecosystem. The resulting "smart bridge" takes an active role in monitoring its own performance while carrying traffic—a triumph that will benefit the Hudson Valley for generations to come. Read more about it in **Metals in Construction** online.

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The Rules: Equal Pay Act

TEXT BY TERRI PETERS

The Equal Pay Act of 1963 requires "equal pay for substantially equal work in jobs requiring equal skill, effort, and responsibility," yet women in architecture and engineering make 84 cents for every dollar men earn, according to 2019 data from the U.S. Bureau of Labor Statistics. That's $13,000 less per year for the median earner in these professions.

The EPA was a step toward pay parity for women, but it clearly was not enough. Its wording requires the work performed by men or women to be virtually identical. As a result, employers have attempted to avoid liability by arguing that jobs are not substantially equal, explains Los Angeles–based workplace discrimination lawyer Genie Harrison: "Employers point to minutiae in the work responsibilities—assignment to different departments, handling different accounts, or small differences in number of direct reports—to justify pay differentials." Additionally, anyone bringing an EPA claim must prove that she was paid less than her male counterparts *because* of her sex.

A worker suspecting pay discrimination should first notify their human resources department—in writing. "Verbal reporting is not advised," Harrison says. "Reporting in writing should trigger an investigation, which is usually required under the law." She recommends hiring independent legal counsel with expertise in employment law. "Be prepared to explain your job, identify your male counterparts, explain why your jobs are substantially similar, explain how you know men are being paid more, and provide documents that support your understanding. Be organized, have a chronology of events, and be prepared to explain your perspective." The prospect of attorney fees can be a deterrent, but Harrison says women can hire legal counsel "on a contingency basis, if they want to bring a case, or on an hourly basis." She finds that two to three hours of consulting is typically enough to "resolve many issues for women who want to keep their jobs."

Some state-specific regulations offer employees greater protection, such as the California Fair Pay Act, which broadens the comparator class to be men who engage in "substantially similar work, when viewed as a composite of skill, effort, and responsibility and performed under similar working conditions," Harrison says. This act also prohibits employers from preventing their employees from sharing wage information with each other, while mandating that employers "retain records of wages, pay rates, and job classifications for three years."

Nationwide, the Lilly Ledbetter Fair Pay Act of 2009 eliminated the statute of limitations of 180 days after receiving a discriminatory paycheck. Individuals can now file a claim regardless of when they discover their pay differential, even if they are no longer with the employer.

The Paycheck Fairness Act, first introduced in the U.S. Senate in 1997, would have added employee protections, including penalizing employers for retaliating against workers who discuss salaries and placing the burden of justifying pay differentials on the employer. However, the bill has yet to pass despite numerous attempts, the most recent of which was in 2019.

Another significant shortcoming of the EPA is that pay inequity is not limited to gender: A racial wage gap also persists. More data is needed to calculate its exact impact in architecture. "I would love to have access to statistics on the percent of women of color in architecture and how the obstacles they face are muddled by race," says Kendall Nicholson, Assoc. AIA, director of research and information at the Association of Collegiate Schools of Architecture.

Collecting and offering access to the right salary data are a good start but, as the numbers indicate, pay parity remains a distant goal. This should concern the entire profession if it wishes to attract—and retain—the best talent.

The amount women made for every $1 earned by men in the same occupation, in 2019

Nursing, psychiatric, and home health aides	$0.95
Arts, design, entertainment, sports, and media	$0.87
Lawyers	$0.85
Architecture and engineering	$0.84
Chief executives	$0.80
Construction managers	$0.80
Physicians and surgeons	$0.75
Real estate brokers and sales agents	$0.66

SOURCE: NARROWTHEGAP.CO AND THE U.S. BUREAU OF LABOR STATISTICS (BASED ON THE 2019 MEDIAN WEEKLY EARNINGS OF FULL-TIME SALARY WORKERS)

> *To read more of The Rules, a monthly series covering important regulations in a clear manner, visit bit.ly/ARTheRules.*

Opinion: Architecture Needs a Culture Shift

TEXT BY MICHAEL CATON, AIA

Among my most prized possessions is a handwritten note that a studio mate left on my desk atop a stack of blue foam during my first year of architecture school: "Hey, Mike, here is some foam. Do what you need to do. You can pay me back when you have it."

I was struggling mightily in that design studio and being pressed to produce more study models. I was also struggling to stay afloat, disoriented by the financial and cultural currents of architecture school. My margins were razor thin in an environment where iteration with costly materials was gospel. The note's author and I were the only Black students in the studio, and among a jarringly minuscule Black population in the architecture program.

In this moment of national reckoning with racial inequity, that tiny, two-decade-old piece of paper exemplifies the virtues that organizations looking to lean in must possess: compassion, meaningful action, and, most important, the grace to see someone fully.

This is also a moment when societal empathy has stunningly reversed—swinging from the plausible deniability of institutional racism's very existence to a stampede of well-meaning allies eager to solve challenges four centuries in the making. This shift is not universal, but that should not dampen anyone's newfound social justice warrior spirit. Being on the right side of history is seldom comfortable nor overwhelmingly popular.

Rooting out the systems that fortify institutional racism is multigenerational work. I don't pretend to have all the answers. However, one area that every person and organization that believes in this work should urgently focus on is inclusivity infrastructure. They must establish foundational systems, checkpoints, metrics, and behaviors to undergird the iterative work of building more inclusive and equitable operations. Though the conversation is taking place nationally, this work must be hyperlocal. The steps toward progress will be vastly different across regions and sectors.

Nevertheless, at least two components will be universal to this work. The first is measurement: Across the operational spectrum, organizations must provide the opportunity for self-identification in data collection. Data must exist in order to evaluate progress and to investigate causation and correlation. Without data, accountability is unlikely. Without accountability, sustained commitment to the causes of inclusion is unlikely. Organizations must treat their inclusivity performance with the same rigor they treat any critical aspect of their business. The fact that this isn't standard practice should be both profoundly sobering and a catalyst for action.

The second component is a culture of candor and trust. This warrants deep, unvarnished introspection on the part of organizations. Do employees of all backgrounds and identities truly feel safe, welcomed, celebrated, and cherished—in that order? Insofar as employees do not feel this way, organizations miss the critical perspective necessary to address vulnerable blind spots and, further, to capitalize on innovative possibilities.

As organizations publicly align themselves with calls for social justice, expecting employees—particularly employees of color—to call out profound internal challenges at the potential expense of their professional growth and mobility is wholly unreasonable. Demonstrating that candid feedback on sensitive issues is welcomed—and that dissenting voices are celebrated and cherished—is incumbent upon the organizations.

The path to the formation of specific solutions to combat organizational biases runs through organizational cultures of candor and trust—held accountable by data. Amid the sweeping awakening to the insidiousness of racial caste in America, organizational inaction is complicity in sustaining systems of inequity. I hope that we, as a discipline, can muster sufficient compassion and fortitude to take meaningful action—and summon the grace necessary to see the entirety of our professional community fully in pursuit of a genuinely inclusive future.

Michael Caton, AIA, is an architect, design strategist, and educator based in New York City.

ZEINAB SHIRANI

> *To read more opinion pieces by thought leaders in the design community, visit bit.ly/AROpinion. Interested in writing? Submit pitches to stories@hanleywood.com.*

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CarbonPositive: Finally, Congress' Climate Action Plan

TEXT BY EDWARD MAZRIA, FAIA, AND NATASHA BALWIT

On June 30, the House Select Committee on the Climate Crisis released a report titled "Solving the Climate Crisis: The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America." The more than 500-page document provides a detailed policy and strategy framework as a guide for federal action addressing greenhouse gas emissions reductions. Architecture 2030 and The American Institute of Architects (among many other organizations) were consulted on the policies and actions needed for the built environment to meet the Paris Agreement target of limiting global average temperature to a 1.5°C increase above pre-industrial levels. The Select Committee's plan provides a framework, not legislation, but is likely to guide federal climate action in the next administration.

While the legislative priorities outlined in either climate plan would, if enacted, translate into bold action and real shifts in architectural and construction practice, we need to accelerate them—now.

Key elements of the Plan include:

- Achieving net-zero emissions from power generation by 2040.
- Incentivizing jurisdictions to immediately adopt a net-zero-emission code based on the Zero Code Renewable Energy Appendix of the 2021 IECC (which was developed by Architecture 2030 and submitted to the IECC by AIA), and mandating adoption by all jurisdictions no later than 2030.
- Increasing funding for the U.S. Forest Service's Wood Innovation Program to further promote use of mass timber in commercial buildings.
- Highlighting strategies that can be used to reduce embodied carbon emissions in the building sector, including reusing existing materials, using less-emissions-intensive materials, and using tools such as the Embodied Carbon in Construction Calculator (EC3).
- Calling for the expansion of tax credits for the reuse and rehabilitation of existing and historic structures.
- Extending tax credits for residential and commercial solar energy generation, and deductions for commercial building energy efficiency improvements.
- Emphasizing the importance of state, local, and tribal climate emissions reduction targets.

Similarly, on July 8, former Vice President Joe Biden and Sen. Bernie Sanders' Unity Task Force released its climate goals calling for net-zero emissions of new buildings by 2030, and eliminating CO_2 emissions from the power sector by 2035. These are the most ambitious U.S. climate plans to date. They also make environmental justice a focus and provide tangible benefits for marginalized communities that often suffer the worst effects of pollution and climate change.

Common to both climate plans is reaching U.S. net-zero CO_2 emissions as soon as possible—and no later than 2050. The 2050 phase-out target date has been cited by governments and industry worldwide ever since the Paris Climate Agreement was signed in 2015.

However, according to the more recent 2018 IPCC "Special Report: Global Warming of 1.5°C" (IPCC SR15), to ensure a 67% chance of limiting the average global temperature rise to 1.5°C above pre-industrial levels, we must act faster. In 2020, the remaining carbon budget of global emissions permissible while still meeting those goals is approximately 340 $GtCO_2$. To keep within this budget, we must reduce emissions by 50% to 65% by 2030, and completely phase out fossil fuel CO_2 emissions by 2040 (and not 2050). Put simply, immediate action is required.

While the legislative priorities outlined in either climate plan would, if enacted, translate into bold action and real shifts in architectural and construction practice, we need to accelerate them—now.

Learning how to design, plan, and build for a 1.5°C carbon budget and world is critical. The CarbonPositive Reset! 1.5°C Global Teach-In this September is an opportunity to commit to the immediate and practicable actions for a high probability at limiting warming to 1.5°C.

> *For more information on Architecture 2030's CarbonPositive Reset! 1.5°C Global Teach-In event, visit carbon-positive.org.*

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Next Progressives: Space Industries

COURTESY SPACE INDUSTRIES

Location:
San Francisco Bay Area and Los Angeles

Year founded:
2018

Firm size:
Four

Firm leadership:
Kevin Bernard Moultrie Daye, ASSOC. AIA, F. Jason Campbell, Celeste Martore, Brenda (BZ) Zhang, ASSOC. AIA

How the founders met:
At the University of California at Berkeley, where BZ, Campbell, and Moultrie Daye earned their M.Arch. degrees, Martore her BA, and where Campbell teaches design studios.

Firm mission:
We are less interested in what architecture is and more interested in what it can do. For us, architecture is a tool set that we use to give form (built or unbuilt) to our inquiries into society and culture. A way to provoke change in ways both superlative and subtle. An exercise in translation.

Personality of your practice:
We are activists, Sampha superfans, painters, millennials who won't get a TikTok, soccer players, (rarely) tardy meeting attendees, book clubbers, Costco club members, Virgos, highly sensitive to color, photographers, Jamaican patty taste-testers, musicians, Craigslist furniture scavengers, songwriters, capoeira students, tactile Luddites dependent on the Adobe suite. But most of all, we are tricksters. We are what we need to be, when we need to be.

One important project and why:
The Anti-racism Design Resources document (bit.ly/anti-racist-design). While we each are navigating the present moment of historic civil rights uprising as individuals, we also had several ideas for how we could participate in movement-building as a collective. Our conversations with each other, and our networks, quickly culminated in this document, which is updated regularly. It is intended to uplift Black design communities and serve as a resource both for communities in need of pro bono design as well as for non-Black and white people to deepen our anti-racism work within design disciplines. We are currently collaborating as part of the Design As Protest Collective to expand its usefulness and reach.

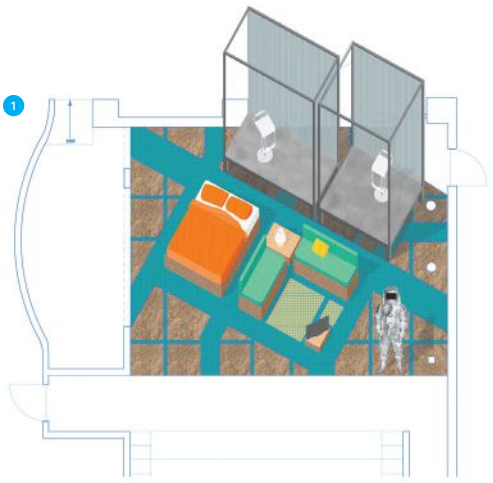
Another important project and why:
One of our first projects was a pro-bono project for a Bay Area social and racial justice nonprofit undergoing an eviction process. We conducted multiple walk-throughs through potential new office spaces, produced as-builts, and provided schematic design drawings and diagrams to assist in conversations they were having about how to reshuffle their staffing, events, and community support programming. For a discipline that is so thoroughly gatekept and siloed, many of our less glamorous skills and tools make a tangible difference in the challenges faced by, and conversations led by, our communities.

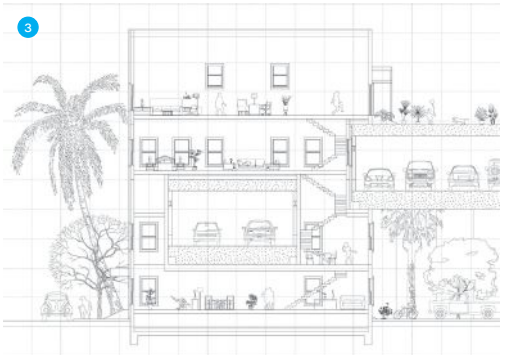
Design trend that should be left behind:
Using the "default" white gaze in design to describe a world that, in the words of James Baldwin, "is not white; it never was white, cannot be white."

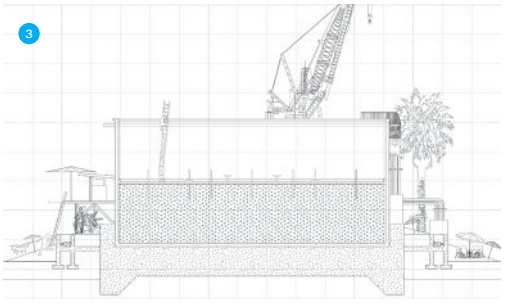
Biggest challenge facing architects today:
We believe that the organizations that architects have set up to assist us in our disciplinary duty to serve have actually further severed the ties between architectural workers and the public. As a discipline, our biggest challenge may be ourselves.

> *For more about the firm visit bit.ly/SpaceIndustries*

Next Progressives:
Space Industries







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> ***bit.ly/anti-racist-design***

This document is intended to uplift Black design communities, serve as a resource for communities in need of pro bono design services, and serve as a resource to non-Black and white people to deepen our anti-racism work within design disciplines. If you haven't engaged in anti-racism work in the past, start now. Feel free to circulate this document on social media and with your friends, family, and colleagues ...

Examples of pro bono services you and/or your firm/practice/collective can offer:
This is a working list of potential pro bono services that can be offered by architectural/design professionals in solidarity with the Movement for Black Lives and in defense of Black Life.

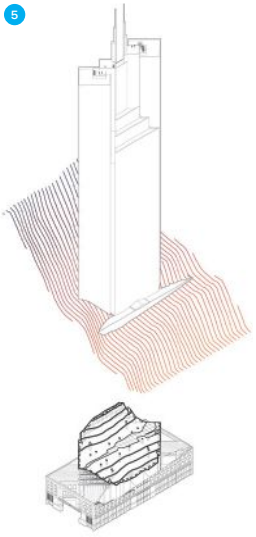
Graphic Design/Visualization: Visualizing data; generating images for signage, social media posts, etc.; and visualizing relationships between objects, bodies, space, urban form, etc.

Spatial/Site Analysis: Organizing; utilizing GIS data; producing floor plans, maps, routes for demonstrations; identifying dimensions, distances, square footage; zoning, diagramming spaces for demonstrations; assessing outdoor spaces and plans for accessibility (wheelchairs, strollers); and producing grading plans (landforms)

Reparative Construction Guidance:
Initial consultation, walk-throughs; permit preparation/support; construction/technical drawings; design/re-design drawings; and material sourcing and guidance.

Project Management:
Coordinating work among design collaborators (e.g., builder and engineer); and draft and/or review project proposals, invoices, etc.

1: CELESTE MARTORE/SPACE INDUSTRIES; 3: BRENDA (BZ) ZHANG/SPACE INDUSTRIES; 4: F. JASON CAMPBELL/SPACE INDUSTRIES



1. “Inked Baby,” a performance piece written by Christina Anderson and installed in San Francisco, relies on a design of two overlaid grids in a neighborhood afflicted with toxic soil to tell the story of the intergenerational suffering of a Black family in the Midwest. 2. An excerpt from the Anti-racism Design Resources document, which is updated regularly with new links and resources to help inspire meaningful action. 3. “Elsewhere, or Else Where?”, an “architectural fever dream” about the Bay Area, considers how society’s current conceptions of home and elsewhere are flawed, and how architecture can help create a new understanding. 4. The Roots and Branches project, curated by ELL, a Campbell-led arts initiative, turned a storefront space into a record shop, exploring the transaction of culture. 5. Moultrie Daye’s thesis project, “A Critique of Pure Violence,” overlays the quarries that enabled San Francisco’s construction onto the city itself, demonstrating how the act of taking up space can be a violent one. 6. “This Will Be The End Of You,” an exhibition that was mounted at Gray Area/Grand Theater in San Francisco. According to Space Industries, it “raised questions about environmental racism in Hunters Point, intentionally positioned Black and non-white cultural objects and references within a Western archive typology, and most pressingly, directly challenged Western hegemonic ideas of personhood, which historically were used as weapons to subjugate people by denying their humanity.”

5: KEVIN BERNARD MOULTRIE DAYE/SPACE INDUSTRIES; 6: BETH LABERGE

Residential:

Columbus Legacy House
Columbus, Ohio
Moody Nolan

TEXT BY KATIE GERFEN

There is more to the smart-looking but unassuming house completed last summer in Columbus, Ohio's Linden neighborhood than meets the eye. With its warm-toned siding, canted roof, and neat walkways, it is a welcoming, comfortable single-family home; but it is also a life-changing opportunity and the first step in a larger plan for change.

It is the first Legacy House, a new prototype for housing conceived of and designed, built, and donated by local firm Moody Nolan—mortgage free—to a family that had been experiencing homelessness. The firm plans 12 such houses in all—one in each metropolitan region in which it has an office.

The program started three years ago, when the firm totaled up its charitable giving at the end of the fiscal year. "We asked: 'Can anyone tell us who it helped?'" says cofounder and chairman of the board Curtis Moody, FAIA. When the firm couldn't answer that question, it decided to use a year's worth of donations to perform an act of radical architecture: to design a house and give it, for free, to a family in need. "We wanted to do something where we could say: 'We built that and helped somebody who really needed it,'" he says.

The firm partnered with Southeast Healthcare and the YMCA of Central Ohio to help identify a family. "We learned that the majority of people in shelters in Columbus are single mothers with kids, so [the house] needed to respond to that," says CEO Jonathan Moody, AIA. "A lot of challenges around homelessness are down to one missed paycheck or rent—with a little help, they would be able to get back on their feet."

The Columbus Legacy House—the first of 12 such residences—has three bedrooms and a covered porch.

SAM BROWN/MOODY NOLAN

The three-bedroom, two-bath Columbus Legacy House sits on a lot donated by the Columbus Metropolitan Housing Authority, and is sized to meet the needs of a family, yet remain affordable for them to maintain, in scale, materials, and systems. It was also designed to appeal to a mass market. "We wanted to design this in a way that any of our own young professionals would be happy to live there—we weren't trying to design something that looked like it was for a person that is in need," Curtis Moody says.

Moody Nolan reached out to local partners who donated everything from building materials to construction services, but it was also a firm-wide effort: "We didn't push the staff to do something, but on their own, they took up the mantle," Curtis Moody says. They volunteered time on site, offering to paint the walls, and, unbeknownst to the Moodys, even raised and individually donated money to furnish the childrens'

> *For more images of this project, visit bit.ly/ColumbusLegacyHouse.*

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Residential:
Moody Nolan

rooms and stock them with toys and clothes, and furnish other areas.

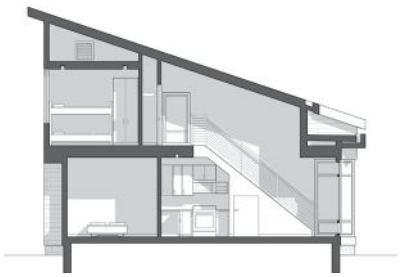
When the keys were handed over, the house became the property of its new family—without a mortgage and without any strings: When the owner chooses, they can sell it to finance their next move, providing security and opportunity.

Access to affordable housing is a critical issue, not just from the perspective of scarcity, but also because, Curtis Moody says, "if you're in a shelter, you have no ability to borrow funds. Even if you have a job, you can't come up with the equity, so at some level, those people can't afford what is considered affordable housing. We felt we could address that one by one. We're going to give them this house and that is the equity for them to take the next step."

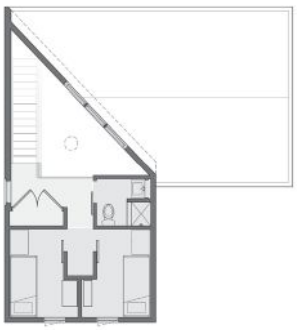
The firm likens the Legacy House program's effect to "a drop in the ocean that can begin to create waves," Jonathan Moody says. "This started as a conversation of one house, in one neighborhood, or even 12 houses in 12 neighborhoods, but the hope is that a lot of people right now are asking: 'What can they do? What can they contribute?' Everyone should be entered in the conversation about how to make an impact, to criticize yourself, and to measure yourself to constantly improve."

The second Legacy House is set to break ground in Nashville in September, and despite a delay for COVID-19, the firm is on schedule to complete 12 houses in 12 years. And it hopes to serve as an inspiration to others: "We're pushing this as something that other architectural firms might want to do—either individually or as a group of firms that come together to design and build a house and gift it to some needy family," Curt Moody says. "There's an ebb and flow to architectural businesses—there's years where firms are doing really great, and they can use those resources for things other than profits for partners." To make lasting change in your community, he says, follow a simple formula: "Do what you can, when you can, with what you've got, while you've got it."

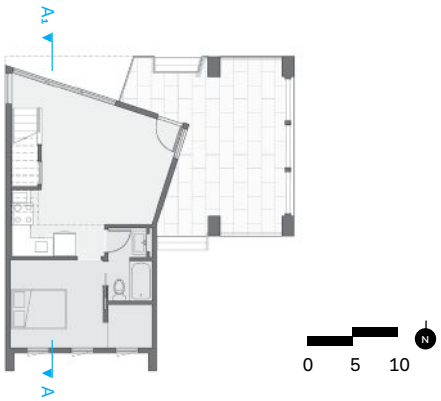
Section A–A₁

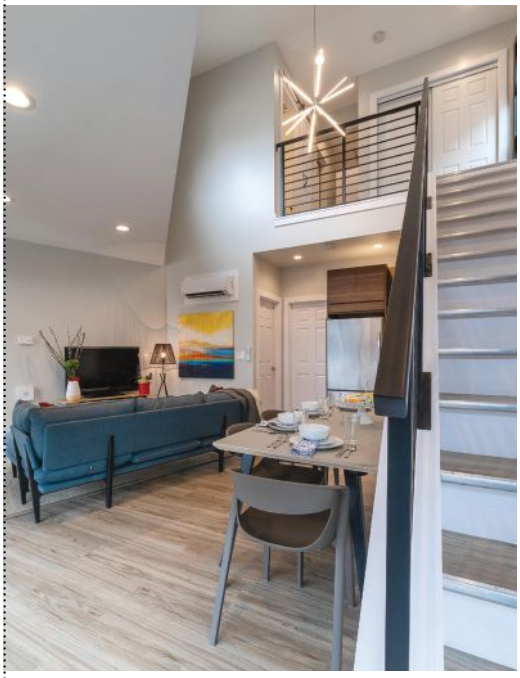


Second-Floor Plan



First-Floor Plan

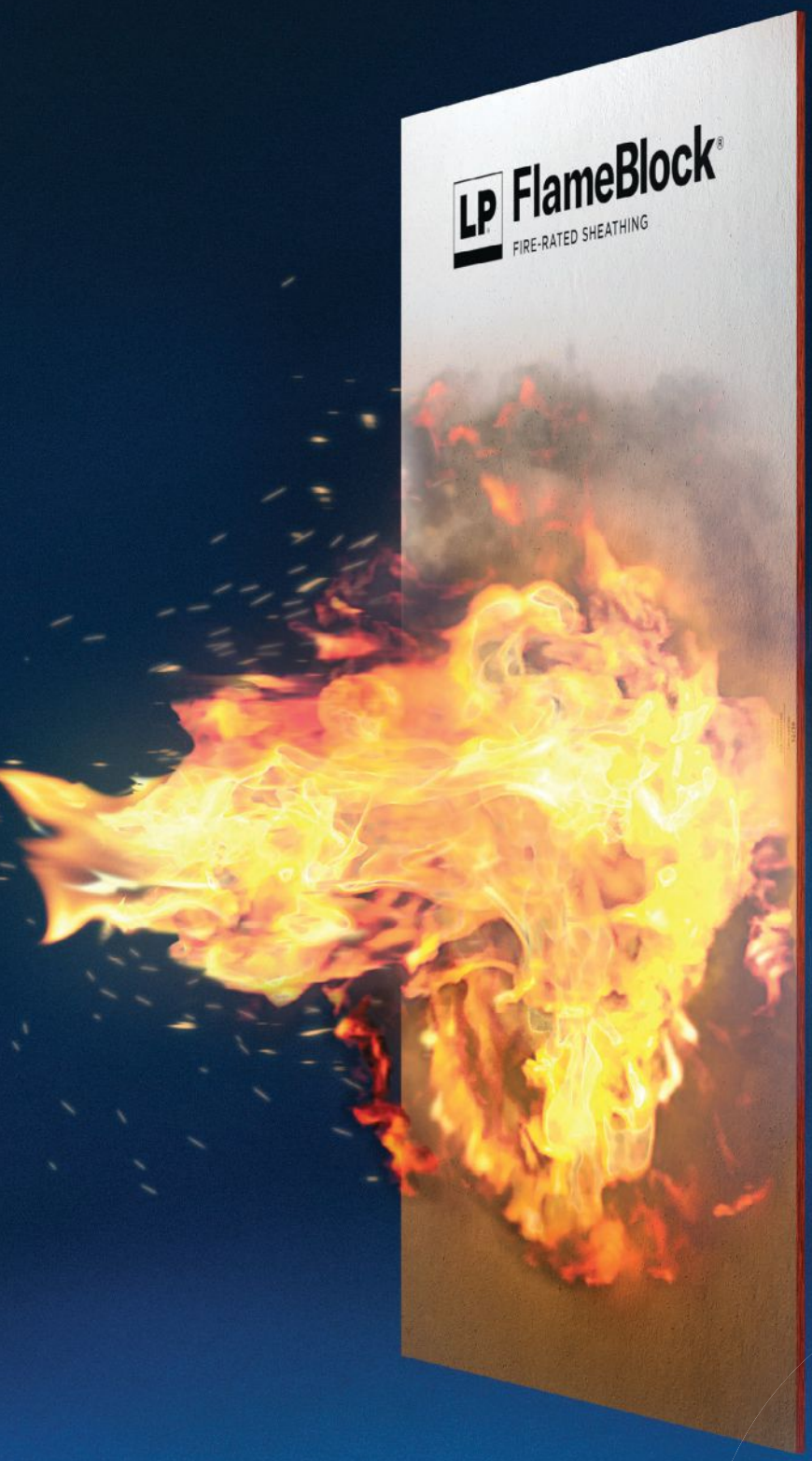




The first floor has an open-plan living area.

Project Credits
Project: Columbus Legacy House, Columbus, Ohio
Client/Owner: Confidential
Architect: Moody Nolan, Columbus · Jay Boone, AIA (partner-in-charge); Kyle Glass, AIA (project architect)
Interior Designer: Moody Nolan, Columbus · Eileen Goodman (partner-in-charge of interior design)
Sustainability Designer: Allen Schaffer, AIA
ME Engineer: Dynamix Engineering
Structural Engineer: Jezerinac Geers & Associates
Civil Engineer: Moody Engineering
Construction Manager: Paul Pryor, AIA (construction administration)
General Contractor: Simco Construction
Landscape Architect: Edge
Lighting Designer: Moody Nolan in collaboration with Dynamix Engineering
Size: 815 gross square feet
Cost: Withheld

SAM BROWN/MOODY NOLAN



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Typology:

Whitney M. Young Jr. Branch Library
Chicago
BKL Architecture

TEXT BY KATIE GERFEN

A new addition (at left) brings daylight to the existing branch library (at right) in Chicago's Chatham neighborhood.

TOM ROSSITER

In 2017, the Whitney M. Young Jr. Branch Library in the Chatham neighborhood of Chicago was bursting at the seams: Its midcentury modern building was a hub for so many community activities, education programs, and social engagements that "I'd say it was over-utilized," says Danielle Tillman, AIA, the managing director of local firm BKL Architecture. "It needed to be rethought to allow for the users to really be able to enjoy it."

Tillman led the renovation and expansion of the library, but before a single line was drawn, the team first engaged with the building users: "It is inherent to a design to understand the needs of the community and the context," Tillman says. Community meetings held by the Public Building Commission allowed the team to interact with residents and "just listen," she says.

Part of what the team heard was that while the existing library was constantly active, its less than ideal siting and design—with its entry on a residential street, and opaque brick walls and low ceilings constraining the space—meant that the building wasn't as connected to the streetscape as residents would like. "It was important for this to be an engaging space—one that didn't turn its back on to the neighborhood," Tillman says. "This is an extremely historic community—we wanted to make sure that this library represented the neighborhood and celebrated it."

The team learned that residents were very interested in furthering the library's role as a community center and social hub. To that end, a new main entry anchors a 2,500-square-foot glazed expansion that completely re-imagines the eastern end of the existing structure. The entry better connects the building to the parking lot, while the addition holds a large community room, a children's reading area, and a glass-walled courtyard that can be used for community events.

Project Credits
Project: Whitney M. Young Jr. Branch Library, Chicago
Client: Public Building Commission of Chicago
Owner: Chicago Public Library
Design Architect/Interior Designer: BKL Architecture, Chicago · Danielle Tillman, AIA, Michael Karlovitz, AIA (project team)
Architect of Record: Johnson & Lee Architects/Planners
Structural Engineer: Larson Engineering
MEP Engineer: dbHMS
Civil/Landscape Engineer: Terra Engineering
General Contractor: F.H. Paschen Contractors
Environmental Engineer: Terracon Consultants
Size: 11,000 square feet (renovation); 2,500 square feet (addition)
Cost: $4.5 million

> *For more photos and a video about the design of this project, visit bit.ly/WhitneyYoungJrBranchLibrary.*

Typology:
BKL Architecture

leaving the old behind: "We wanted to honor the fact that this building did so much," Tillman says. "Instead of abandoning it, we decided to celebrate the pieces of it that we could highlight."

They kept the exposed waffle-slab ceilings, but removed interior partitions to create an open reading room, which is now flooded with daylight from existing glazing and the addition. "It was important for it to be much more open to allow for people to feel comfortable within the space," Tillman says. "The glass allows a connection between the streetscape, the city, and the people using it. That relationship between the building, its users, and the neighborhood was really important."

Also important was technology. The team added more computer terminals, as well as a maker space, a recording studio, and a multimedia area, which have been popular creative outlets for teenage visitors. "It's engaging for every level of the community," Tillman says.

The library opened last year, and was immediately filled with activity—so much that Tillman wonders if another expansion may be necessary down the line. "I really do think that these kinds of projects are really at the heart of what architecture can do for communities," she says. "And, to be honest, as an African American woman and an architect who was able to work in an African American community and provide something that, I hope, the community can enjoy and use to create innovation—it was a joy to work on the project, and with the people of the neighborhood, to get it done."

Top: The glazed addition reconnects the library to the streetscape.

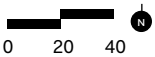
Left: Original details, like the waffle-slab ceiling, remain in the renovated and reorganized interior.

The new courtyard replaces a smaller and disused one on-site. "Residents have jazz nights and wine and cheese nights," Tillman says. "We wanted to give them the ability to have indoor/outdoor space, and highlight the functions they celebrate within the neighborhood."

While the addition is the most visible aspect of the project, it makes up only a small part: The library's 11,000-square-foot interior was renovated and reorganized to provide a more efficient, 21st-century space. But that didn't mean

Floor Plan

1. Courtyard
2. Children's area
3. Community room
4. Reading room
5. Staff area
6. Maker lab
7. Recording studio
8. Media lab



TOM ROSSITER

IS YOUR STUDIO FIRST CLASS?

The Studio Prize is an annual design awards program that recognizes innovative, thoughtful, and ethical studio courses at accredited architecture schools. The prize is designed to celebrate the creativity of studio course curricula and projects—and, this year, the resilience of faculty and students during the COVID-19 pandemic. The exclusive sponsor, Sloan, has generously made $20,000 available for student prizes. The jury will also confer the $5,000 Sloan Award to students in a winning studio or studios that address sustainability, specifically water conservation.

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On the Boards:

Jamaican Houses of Parliament
Kingston, Jamaica
Design Collaborative and Hines Architecture + Design

TEXT BY MADELEINE D'ANGELO

In 2018, the Government of Jamaica and the country's Urban Development Corp. launched a design competition for a new Houses of Parliament building in Kingston's National Heroes Park, which garnered submissions from 24 international teams. After a two-stage, 18-month-long deliberation, the jury and the people's choice vote selected "Out of Many, One People"; the winning team presented the final design development this past January.

Led by architect Evan Williams, founder of Kingston-based Design Collaborative, the team includes design architect Daimian Hines, AIA, founder of Hines Architecture + Design; project manager Christopher Bent, ASSOC. AIA; and technical consultant Gregory Lake, AIA. Hines, Bent, and Lake are all based in Houston.

Situated on an 11.4-acre parcel within Heroes Park, the design centers around a roughly 160,000-square-foot circular structure—embodying equity within Jamaica's Commonwealth government. "For visitors, developers, and citizens, this building should have no front, no side, no back," Hines says. A ring of X-shaped columns wraps the building's 300-foot perimeter—a dynamic spatial representation of both the Jamaican flag and the bond between the nation's voters and their elected officials. "Figuratively and literally, I wanted [those] to be the pillars of the building," Hines, who grew up in Jamaica's St. Mary Parish, says.

In addition to chambers for the Senate and the House of Representatives, the structure includes atria and galleries. The landscape design for the surrounding park features local, drought-resistant plants.

Using models, renderings, and virtual reality, the team shared the initial plans with stakeholders, incorporating feedback and making changes—to column scale and outdoor programming, for example—based on their, and the community's, input. "Design is objective when there are enough voices at the table to provide inputs to make any design approach stronger," Hines says.

With Williams and his firm Design Collaborative leading the construction phase, the project is slated to break ground in 2021. And despite building constraints during the COVID-19 pandemic, "this is one of those projects that we must continue," Hines says. "It's vital to the identity of the country and the direction Jamaica wants to go."

COURTESY DESIGN COLLABORATIVE AND HINES ARCHITECTURE + DESIGN

Project Credits
Project: Jamaican Houses of Parliament, Kingston, Jamaica
Design Architect: Hines Architecture + Design
Executive Architect: Design Collaborative
Landscape Architect: OJB Landscape Architecture
Structural Engineer: Buro Happold
Civil Engineer: Vogt Engineering
MEP Engineer: DBR Engineering Consultants

> *For more renderings of the Jamaican Houses of Parliament, visit bit.ly/JamaicanHousesofParliamentProject.*


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Sensory Design and Eliciting Emotion

THEORIES OF HOME, LIVING, AND WHAT IT MEANS TO EXPERIENCE A SPACE

Presented By: GAGGENAU

Projects such as Faulkner's Martis Camp House follow a well-established design tradition that places a high value on pastoral quietude. But how should we think about more urban accomplishments in sensory experience? Martis Camp House | Lake Tahoe. *Photo Courtesy of: Faulkner Architects*

LEARNING OBJECTIVES

1. Analyze the spatial philosophies of Heidegger and Bachelard, and the ways in which their theories have influenced modern residential design and architecture.
2. Discover the ways in which pared down design, at first seemingly simplistic, creates opportunity for depth and meaning by bridging the boundaries between exterior and interior, eliciting emotion, and helping to establish a sense of home in any location.
3. Consider design, the timelessness of a space, and the importance of form and materials when creating the emotional space.
4. Examine ways to create spaces dedicated to wellbeing, comfort, and privacy even within the busiest cities.

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PEOPLE, LAND, AND SPACE: AN INTRODUCTION TO ARCHITECTURAL PHILOSOPHIES

At the source of the Danube, tucked in the southwest corner of Germany near the Swiss and French borders, lies Germany's Black Forest. Deep, river-carved valleys meet glacial lakes and woodlands of fir and pine as they rise to rounded hills and granite summits. The conifers are so numerous and dense their canopy can block out sunlight, leading early German inhabitants to dub the region, *Schwarzwald*, or Black Forest.

Footpaths winding through the forest, said to be some of the first established in the world, in addition to ancient castles and the varied, magical landscape, are rumored to have inspired the Brothers Grimm to write such fairy tales as Hansel and Gretel, Rapunzel, and Sleeping Beauty.[1]

The Black Forest also lends itself to poetic ruminations by German philosopher Martin Heidegger: "The sky is the vaulting path of the sun, the course of the changing moon, the wandering glitter of the stars, the year's seasons and their changes, the light and dusk of day, the gloom and glow of night, the clemency and inclemency of the weather, the drifting clouds and blue depth of the ether," as he considered the relationship between human beings and the land.[2]

Heidegger's Hut: At Home in the Black Forest

Home for centuries to farmers, followed by loggers, woodworkers, and eventually metalworkers, the Black Forest also inspired Heidegger to contemplate buildings and what it means to create a home. Heidegger examined dwellings, constructed in the 1700s by Black Forest peasants, that were built into the land. He believed it was an innate

connection between people and nature that inspired the farmhouses to be placed "on the wind-sheltered mountain slope looking south, among the meadows close to the spring. It gave it the wide overhanging shingle roof whose proper slope bears up under the burden of snow, and which, reaching deep down, shields the chambers against the storms of the long winter nights."[3]

The structure and style of the farmhouses, for Heidegger, sprang from the connection between people and the specific, unique natural landscapes that surrounded them. The farmhouses were nestled into the mountain slope, protected from the elements yet inspired by them and built with them in mind. Heidegger himself lived in the Black Forest for a period of time, where the pastoral landscape influenced some of his thinking and writing. Known as "Heidegger's Hut," his home can be discovered today by taking one of the ancient footpaths through the forest. Much like the farmhouses he writes about, Heidegger's Hut is in a meadow surrounded by trees, where its pitched roof nearly meets the slope of a hillside.

Heidegger's Influence on Architecture

While Heidegger's politics and biography are steeped in controversy and uncertainty, his philosophies have "influenced more than one generation of architects." Writing in the early- to mid-1900s, Heidegger's work, particularly his essay "Building Dwelling Thinking," challenged "the procedures and protocols of professional practice, his standpoint on architecture part of a broader critique of the technocratic Western world. In a post-war era when Westerners seemed to justify their actions with increasing reference to economic and technical statistics, he pleaded that the immediacies of human experience shouldn't be forgotten. According to him, people make sense first through their inhabitation of their surroundings, and the emotional responses to them. Only then do they attempt to quantify their attitudes and actions through science and technology."[4]

Heidegger espouses theories of experience—where science and technology come second to emotion—and questions not necessarily how to build, but how to meaningfully occupy or create space in the built environment. He contends "the primary trade of architects is arguably in human experience," and for Heidegger, experience was rooted to time, place, and emotion.[5]

Some scholars believe, "Architecture can and has been conceived as an intrinsically philosophical enterprise—grounded in aesthetics and ethics (including theories of human nature)—and also in elements of social and political philosophy. Architects, landscape architects, and designers are responsible for creating spaces and fashioning the world (materially and ideationally) in which people live and interact. In so doing they promote as well as undermine certain values, understandings, and ways of living."[6] Intertwined with architecture and design are theories of how to live well in the built environment, including at home, as well as how the built environment can both exemplify and create different values.

Dreamy Living: Bachelard's Spatial Theories of Dwelling

As well as having influenced architects, Heidegger's writings relate to other philosophies on living and dwelling. For instance, French philosopher Gaston

"I spent a lot of time as a child observing in a woodworking shop across the street from the house where I grew up. I became interested in trying to make shapes out of wood. With young eyes and sensitivities, I watched how trees grew, altered by how the sun hit them, changing the qualities of the lumber produced. I came to understand the absolute balance between a form and the material from which it is made. I experienced the inner struggle inherent in the human act of applying will to give birth to a form."[37]

— Tadao Ando

GLOSSARY

Academy of Neuroscience for Architecture (ANFA)—seeks to promote the understanding of the link between neuroscience and human responses to the built environment, and is composed of scientists and architects

Aida* or *Aidagara—notion of relatedness; "refers to space or place in which people are located and in which the various crossroads of relational interconnection are established"

Bachelard, Gaston (1884--1962)—French philosopher who contributed to architectural theory, poetics and literary criticism, space, the philosophy of science, dreams, and the imagination

Black Forest—region in southwest Germany; known for inspiring Brothers Grimm and others; tourist destination for its landscapes and hiking trails

Electroencephalogram (EEG) Headsets—measure brain activity relating to mental states and mood

Heidegger, Martin (1889-1976)—German philosopher whose work contributed to architectural theory, phenomenology, existentialism, contemporary European philosophy, literary criticism, psychotherapy, and cognitive science

Late Modernism—reductive and functionalist; typically characterized by harsh, abstract, or geometric design, as well as a lack of ornamentation and a use of industrial materials

Peras—Greek for boundary; place from which something begins its presencing

Tetsurō, Watsuji (1889–1960)—Japanese philosopher who wrote on aesthetics, Japanese ethics, relationships, and existing Eastern and Western philosophies

Yūgen—"wherein the ineffable presence of living nature is sensed trough such things as a faint drizzle or a sudden unexpected breeze, the onset of twilight or the promotion of dawn"; characterized by a "subdued, serene beauty" where "refinement and loftiness" are often combined with "simplicity and austerity." These traits go hand-in-hand with a calm, "emotional subtlety" that signifies "not lack of emotion but quiet depth"

152 Elizabeth Street | New York City. *Photo Courtesy of: Gabellini Sheppard Associates*

Martis Camp House | Lake Tahoe. *Photo Courtesy of: Faulkner Architects*

Bachelard, who lived and wrote in the same time period as Heidegger, also contemplates space. *Harvard Design Magazine* notes, "Although Bachelard was specifically concerned with the psychodynamics of the literary image, architects saw in his excavation of the spatial imaginary a counter to both technoscientific positivism and abstract formalism, as well as an alternative to the schematicism of the other emerging intellectual tendency of the day, structuralism."[7]

Bachelard's theories are, in part, a reaction to late modernism. Rejecting seemingly harsh, abstract, or geometric design or tangible objects, Bachelard prefers to create parallels between literary and spatial forms, embracing surrealism. He believes "space is the abode of human consciousness" and studies how space can accommodate consciousness. For Bachelard, consciousness is reverie—or a half-dreaming state of being. As Harvard Design Magazine summarizes, "Bachelard would undoubtedly argue that almost everything we know about architecture as a historical discipline stands in the way of everything we can know about the poetics of dwelling." Bachelard's romanticized view of living in the built environment encompasses nature and culminates in a vision of the ideal as "'a house that comes forth from the earth, that lives rooted in its black earth.'" Intertwined with such pastoral images is the idea of space as "'felicitous.'" Half-conscious dreaming, nature, and emotion form major components of Bachelard's views on meaningful spaces.[8]

What Happens in Nature...Can Happen in the City?

Broadly speaking and for the purposes of this course, the common links between Bachelard and Heidegger are their idealistic interpretations of space and home, as well as their influences on contemporary architecture and design. Heidegger's discussions of spaces, particularly houses, are often nostalgic and rooted in timelessness, and he thinks of home as being integrated with nature. Nostalgia is also present in Bachelard's writing, but he further focuses on consciousness. Both theorists considered the connection between people and nature, the emotions that can be elicited from a space, and what it means to inhabit the built environment—specifically home. Many architects, ranging from Le Corbusier to Frank Gehry and Tadao Ando, have intentionally incorporated or rejected elements of Bachelard's and Heidegger's viewpoints in their work.

While both Heidegger and Bachelard romanticize the countryside and the perceived manner of living and dwelling it provides, contemporary architects and designers are proving that the philosophers' theories are also applicable in the city. Material selection, as well as the use of elements such as light, air, water, and sound, can help to create idyllic homes in the center of a city. In this course, architects designing residences in both the city and the country, specifically Tadao Ando, Michael Gabellini, and Greg Faulkner, will be shown to incorporate nature in their work, simultaneously creating spaces that elicit emotion and provide occupants with an escape from the outside.

COUNTRY AND CITY COMMONALITIES

To Heidegger, the homes in the Black Forest inspiringly mattered because they permitted inhabitants to occupy spaces meaningfully and harmoniously with the surrounding landscape. Bachelard too equates living well with living in nature, maintaining, "A house in a big city lacks cosmicity. For here, where houses are no longer set in natural surroundings, the relationship between house and space becomes an artificial one. Everything about it is mechanical and, on every side, intimate living flees."[9] Both theorists reject modernist trends toward urbanization and believe that living well and living with purpose in the built environment can occur only in the country. The city is antithetical to their vision. The upcoming section illustrates the ways in which different homes, the Martis Camp House near Lake Tahoe and the residences at 152 Elizabeth in New York City, simultaneously illustrate and refute Heidegger's and Bachelard's thoughts.

A modern-day home that illustrates and elevates some of Heidegger's and Bachelard's thoughts about dwelling is Greg Faulkner's Martis Camp House. In some ways similar to ideas Heidegger espouses about the Black Forest homes, the Martis Camp House is tucked into a forested mountainside, sheltering its occupants from extreme

weather. At the same time, it does not disrupt the landscape. North-facing and steeply sloped, the home is vertically situated in a very small directional envelope on a ski run on the mountain. Because of the site and specific location, when Faulkner considered form, he "thought about the space first and mirrored the clearing through the woods up the slope like the ski run." He then created "an access through the heart of the house, and then developed territories with varying degrees of privacy along the way—amounts of closure or openness depending on the use." Faulkner maintains, "The house is very much buried into the slope."[10] The design of the Martis Camp House takes its inspiration from the unique, immediate natural environment, and the house ultimately becomes part of the landscape. The "relationship between house and space," as Bachelard says, is here seamlessly celebrated.

This article continues on http://go.hw.net/AR082020-4.
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We would like to extend special thanks to Michael Gabellini of Gabellini Sheppard Associates and Greg Faulkner of Faulkner Architects for their contributions and insight in the creation of this continuing education course.

SPONSOR INFORMATION

GAGGENAU

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QUIZ

1. Which philosopher, referenced throughout this course, used inspiration from Germany's Black Forest to contemplate buildings and their use to create a home?
   a. Bachelard
   b. Watsuji
   c. Heidegger
   d. Hume

2. Which thinker, referenced throughout this course, preferred to create parallels between literary and spatial forms, embracing surrealism and believing that "space is the abode of human consciousness"?
   a. Bachelard
   b. Watsuji
   c. Heidegger
   d. Hume

3. In 2003, the San Diego Chapter of the AIA founded the non-profit Academy of Neuroscience for Architecture (ANFA), which seeks to promote the understanding of the link between neuroscience and _____ to the built environment, and is composed of scientists and architects.
   a. Evolution
   b. Neuroscience
   c. Human Response
   d. Energy

4. A researcher who studies the psychological impact of design has found that people are particularly impacted by _____. There is a tendency of people to hurry past mass-produced, blank, cold spaces while slowing down for convivial spaces.
   a. Buildings with water
   b. Building façades
   c. Building elevators
   d. Buildings with corporate logos

5. According to the course materials, architects and scientists studying neuroscience and the built environment have the goal of:
   a. Creating a space where people treat each other kindly
   b. Creating a space where people feel good
   c. Creating a sense of connectedness through spatial relation
   d. All of the above

6. In the 152 Elizabeth project, Ando primarily uses _____ to create enclosed spaces.
   a. Wood panels
   b. Curtain walls
   c. Thick concrete walls
   d. Steel

7. For Faulkner, _____ design provides the opportunity stop focusing on the ocular view of the project, and start focusing on the experience.
   a. Contemporary
   b. Modernist
   c. Minimalist
   d. Renaissance

8. At 152 Elizabeth, Gabellini uses which of the following to guide the design concept to both create and blur boundaries between inside and outside?
   a. Light
   b. Air
   c. Sound
   d. Water
   e. All of the above

9. In Faulkner's Martis Camp House, _____ was used to transition from outdoors to indoors and provide continuity between the built place and the site overall.
   a. Basalt flooring
   b. Wood paneling
   c. Concrete
   d. Steel beams

10. As referenced in the course materials, Watsuji describes _____ as the all-important concept that one inhabits an entire interconnected network of influences that together create an entire people's attitudes and value.
    a. Science
    b. Air
    c. Water
    d. Climate

Addressing the Pains of Increased Disinfection Protocols on Architectural Wall Coatings in Healthcare: A Prescription for Success

Presented By:

covestro

By Steven Reinstadtler, Infrastructure Marketing Manager—Coatings at Covestro LLC

LEARNING OBJECTIVES

1. Examine the risk that healthcare acquired infections (HAIs) pose to patients and the disinfection protocols used to mitigate them.
2. Understand how disinfection and sterilization protocols can affect architectural wall coatings in healthcare facilities.
3. Explore testing that compared several paints and coatings in rigorous hospital environments and how they performed based on odor, durability, and cleanability.
4. Describe how two component waterborne polyurethane wall coatings combine high performance with aesthetics to meet both the needs of healthcare administrators and designers.

CONTINUING EDUCATION

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NOVEL VIRUS LEADS TO AN INCREASE IN HEALTHCARE ACQUIRED INFECTIONS

In 2020, we were exposed to the reality of the COVID-19 disease pandemic, brought on by the spread of the SARS-CoV-2 virus across the world. Being a novel coronavirus, it causes major concern because the human immune system globally hasn't been exposed to it before and therefore does not have any resistance or antibodies ready to help fight the infection. The COVID-19 disease, like others caused by viruses, present their own set of challenges and pains for hospital and healthcare professionals because of their ability to be spread on surfaces in healthcare facilities. However, this recent acute issue serves to aggravate an already existing chronic condition in which a host of microorganisms such as viruses (i.e. influenza and noroviruses), bacteria (i.e. E. coli, C. difficile, MRSA) and other microbial pathogens cause such significant risks to patient health that healthcare organizations have dedicated personnel, procedures, and budgets specifically targeted at controlling or eradicating healthcare associated infections (HAIs), also known as hospital acquired infections.

Because this is an ongoing battle, national healthcare organizations such as the Centers for Disease Control and Prevention (CDC), The Joint Commission (TJC), and the U.S. Environmental Protection Agency (EPA) have developed and routinely update strict guidelines for addressing healthcare associated infections in healthcare facilities. These detailed protocols have been extremely effective in controlling infections over the years and hospital personnel such as doctors, nurses, environmental services, and facility maintenance daily apply the protocols diligently while performing their jobs. However, some of these guidelines, which include personal hygiene practices, sterilization of medical devices, and disinfection of architectural surfaces with harsh chemicals and techniques, exact

a toll on some areas of the healthcare infrastructure. One observation of these heightened actions is the accelerated degradation of painted wall surfaces in rooms of healthcare facilities that are considered higher risk due to the activities that are performed in the area and the need for higher hygiene precautions.

Hospital administrators, facility managers, and the architectural community are concerned with meeting these current CDC and TJC guidelines, as well as newer heightened COVID-19 precautions in the EPA's Emerging Viral Pathogen Policy, without sacrificing aesthetics and durability. Fortunately, there are architectural coating technologies specifically formulated for targeted hospital environments that require a higher frequency of cleaning with harsher disinfectants. These novel coating technologies offer improved durability and resistance to harsh cleaners and disinfectants without sacrificing appearance. But first, we must better understand the enemy by understanding the symptoms of current and newer disinfection requirements and the chemicals and procedures involved, the magnitude and spread of the problem, the diagnosis process, and the deleterious effects of not treating the problem. Only then can we review and compare the possible prescriptive treatments, benchmark testing methods and results, and infrastructure 'recovery' examples related to this topic. Hopefully, this learning unit will serve to educate the architectural reader but also be a reference document going forward that the reader can consult for specific healthcare infrastructure disinfection guidelines, methods, and materials.

OBSERVING THE SYMPTOMS AND AGGRAVATING CONDITIONS

Healthcare associated infections, also known as nosocomial infections, are infections that patients get while receiving treatment for medical or surgical conditions. HAIs occur in all settings of care, including hospitals, surgical centers, ambulatory clinics, and long-term care facilities such as nursing homes and rehabilitation facilities. Healthcare associated infection has become a major threat to human life over the past several decades with an increased volume of patients requiring medical attention and the ongoing resistance of certain microbes to traditional antibiotics. For example, in American hospitals alone, the Centers for Disease Control tabulate HAIs yearly based on required data collected by hospitals and estimate that HAIs account for 1.7 million infections and 99,000 associated deaths each year. Patients who acquire infections from surgery spend, on average, an additional 6.5 days in the hospital, are five times more likely to be readmitted after discharge, and are twice as likely to die. Moreover, surgical patients who develop infections are 60 percent more likely to require admission to a hospital's intensive care unit. Surgical infections are believed to account for up to $10 billion dollars annually in healthcare expenditures.[1]

CDC's Guideline for Disinfection and Sterilization in Healthcare Facilities

More recently the global COVID-19 pandemic has only increased the need and frequency for stringent disinfection. Hospital administrators have come under increasing pressure from health organizations such as The Joint Commission, the Centers for Disease Control and Prevention, and the Environmental Protection Agency to change or update standard facility disinfection and sterilization guidelines. In 2008, the CDC revised the protocols for the safe operation of a healthcare facility. These protocols are referred to as the Guideline for Disinfection and Sterilization in Healthcare Facilities and are periodically revised to reflect the results of the latest evidence-based studies. Some of the changes affected the way critical areas such as emergency, operating, and procedure rooms are disinfected between each patient use as well as during terminal cleaning.[2]

EPA's Emerging Viral Pathogen Policy

The EPA's Emerging Viral Pathogen Policy was issued to provide specific guidance related to the COVID-19 pandemic. The EPA recently released a new list of disinfectants that can be used against the virus that causes the coronavirus (COVID-19) disease. All of these disinfectant products qualified for a streamlined pesticide approval process under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the

GLOSSARY

Hospital Acquired Infection (HAI)—Also known as nosocomial infections, HAIs are infections that patients get while receiving treatment for medical or surgical conditions; they occur in all settings of care, including hospitals, surgical centers, ambulatory clinics, and long-term care facilities such as nursing homes and rehabilitation facilities

Coronavirus disease 2019 (COVID-19)—A respiratory illness that can spread from person to person that causes mild upper-respiratory tract illnesses; COVID-19 is a new disease, caused by a novel (or new) coronavirus that has not previously been seen in humans

Centers for Disease Control (CDC)—A United States federal agency, under the Department of Health and Human Services, that is tasked with protecting America from health, safety, and security threats, both foreign and in the U.S. CDC conducts critical science and provides health information that protects our nation against expensive and dangerous health threats, and responds when these arise

The Joint Commission (TJC)—A United States-based nonprofit tax-exempt 501 organization that accredits more than 22,000 US health care organizations and programs

List N—List of products that meet the EPA's criteria for use against SARS-CoV-2, the virus that causes COVID-19; List N defines the products containing the specific disinfectant chemicals and contact times to control the virus

Surface disinfection treatment by airless spray application—Spray units used to apply a film of EPA List N chemicals on walls, furniture, bed components, and other equipment as prescribed by the relevant guidelines

Vaporized hydrogen peroxide—An automated system that fogs or mists the room and all the contents with a predetermined concentration of a product such as hydrogen peroxide

Ozone mist system—Automated ozone generating system that bathes the room with anti-microbial mist that kills microorganisms on vertical and horizontal surfaces

2K waterborne polyurethane-based coating—A water-based, breathable, aliphatic polyurethane wall coating that offers a variety of superb benefits to commercial projects such as excellent disinfectant and stain resistance, very low VOCs and odor, and desired aesthetics

Crosslinking—Entanglement and reaction of long polymer chains that increases physical strength and chemical resistance in 2K waterborne polyurethane coatings

agency's Emerging Viral Pathogen program. This list only covers surface disinfectants as hand sanitizers are regulated by the U.S. Food and Drug Administration (FDA).

AGGRAVATING CONDITIONS

For a variety of past reasons and new challenges, there are three primary aggravating conditions that traditional wall paints face in the healthcare environment:

- Abrasion from existing disinfection guidelines
- Paint surface degradation from disinfection chemicals
- Newer disinfection methods and devices

Abrasion from Disinfecting Guidelines

By cleaning horizontal and vertical surfaces more often, the existing wall paint is subjected to increased abrasion which it may not have been exposed to in the past. This increased abrasion can be caused by several scenarios. First, more frequent use of the area and the wear-and-tear from bumps and scuffs from the increased movement and placement of auxiliary equipment in the room such as carts, operating tables, beds, and tray holders can affect the durability of the wall coating. However, observations have found that certain areas of the walls near tray tables and other auxiliary equipment are routinely cleaned by hospital environmental services personnel when biological contaminants may have transferred due to touch or splatter.

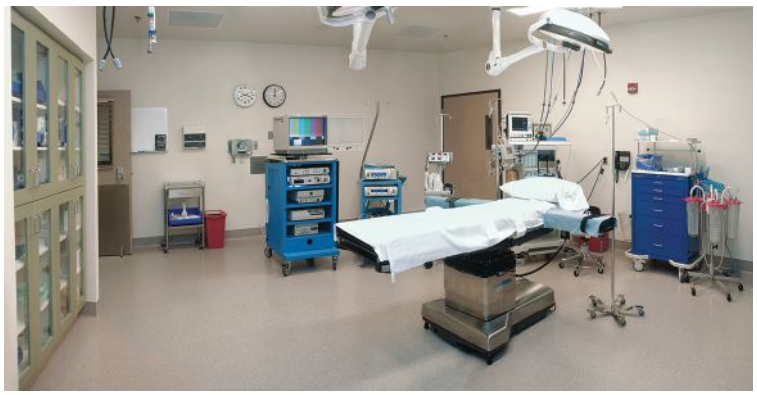
These areas can be cleaned using commonly available pre-treated disposable wipes, which are often wetted with a 1:10 sodium hypochlorite (bleach) solution. The repeated process of wiping the wall surface with a fibrous disposable material along with the strong concentration of bleach can cause a traditional wall paint to break down and wear away over time. This poses a hygiene issue since the loss of the continuous paint film exposes the porous drywall surface which can allow absorption of biological contaminants and make the disinfection process more difficult.

Paint Surface Degradation Due to Disinfecting Chemicals

An additional aggravating condition can be the use of a lower sheen wall paint that was selected for aesthetic reasons. The architectural design community has long recognized the benefits of certain colors and sheens in the healthcare sector to facilitate a warmer and welcoming environment for patients in a stressful situation. These types of finishes typically do not resist scrubbing and abrasion as well as their high gloss counterparts. This can accelerate the wear on the painted surface, further exacerbating the problem. In order to compensate, hospital facility managers and the architects who specify these paints have been forced to limit their design palette of acrylic latex paints to gloss or semi-gloss finishes in critical areas as an attempt to marginally extend longevity. Other more durable coating options such as epoxy have had limited success due to the unacceptable odor during application as well as possible color shift over time.

However, abrasion is not the only aggravating condition of wall paint failure. The regulations on the types of disinfecting chemicals and cleaners and their strength have challenged the chemical resistance inherent in traditional architectural coatings. More recently due to the COVID-19 pandemic, hospitals and healthcare facilities, outpatient and urgent care facilities, and nursing homes have instituted even more aggressive cleaning regimens on vertical wall and horizontal floor areas. Recently, the U.S. EPA addressed current COVID-19 disease disinfection concerns by creating List N. All products on this list meet the EPA's criteria for use against SARS-CoV-2, the virus that causes COVID-19. List N defines the products containing the specific disinfectant chemicals and contact times to control the virus. The contact time, which is the amount of time the surface should be visibly wet, must be considered since these times vary by product and chemistry. This point is often overlooked in considerations since most people equate cleaning surfaces as similar to wiping their kitchen table off after a meal. However, in the healthcare sector, hospital personnel are well-trained in the need to have the correct contact or dwell time on the surface in order to achieve adequate and thorough disinfection. The following is an abbreviated, generic list of active ingredients and contact times from List N to give the reader a sense of the types of disinfectants that are being used.

It is important to note that many of the products prescribed to be effective for destroying the SARS-CoV-2 virus are a mixture of several different chemicals



The repeated process of wiping the wall surface with a fibrous disposable material along with the strong concentration of bleach can cause a traditional wall paint to break down and wear away over time.

TABLE 1: LIST N ACTIVE INGREDIENTS AND CONTACT TIMES

Active Ingredient(s)	Common Concentration	Contact Time
Sodium hypochlorite	0.65% (1:10 dilution in water)	1–3 min.
Hydrogen peroxide	3–6%	3–15 min.
Ethanol	60–70%	5 min.
Isopropyl alcohol	60–70%	5 min.
Quaternary Ammonium salt	1.5%	10 min.
Citric acid	varies by type	5–10 min.
Glutaraldehyde	2% in aqueous pH 8 solution	10 min.
Peracetic or Peroxyacetic acid	35%	1–5 min.
Phenolics	varies by type	5–10 min.
Potassium peroxymonosulfate	1%	5–10 min.
Povidone-iodine	7.5%	5 min.

to increase their efficacy. For example, peroxyacetic acid is often blended together with hydrogen peroxide in disinfection products for a more active combination. These mixtures can be even more challenging when considering the chemical resistance of a wall paint or coating.

New Methods for Disinfecting and Sterilizing Critical Areas

Finally, a third aggravating condition for the long-term performance of architectural wall paints is the advent of several newer methods and technologies for disinfecting and sterilizing critical areas of the healthcare environment. The two methods that are particularly relevant in this situation are:

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QUIZ

1. Healthcare associated infections which occur while receiving treatment for medical or surgical conditions is the definition of which term?
   a. Nosocomial
   b. Infection-based virus
   c. Pathogenic spread
   d. Bacteria

2. According to the CDC, healthcare associated infections account for 1.7 million infections and _____ associated deaths each year.
   a. 25,000
   b. 50,000
   c. 75,000
   d. 99,000

3. Which of the following is an aggravating condition for the long-term performance of architectural wall paints in healthcare environments?
   a. Abrasion from existing disinfection guidelines
   b. Paint surface degradation from disinfection chemicals
   c. Newer disinfection methods and devices
   d. All of the above

4. Before 2K waterborne polyurethane paint became an option, which finish did architects have to specify in critical areas as an attempt to marginally extend the longevity of wall paint?
   a. Acrylic
   b. Matte
   c. Flat
   d. Epoxy
   e. Gloss

5. Which new method for disinfecting critical areas requires applying a film of EPA List N chemicals on walls, furniture, bed components, and other equipment?
   a. Surface disinfection treatment by airless spray application
   b. Automated vaporized hydrogen peroxide
   c. Automated UV-C light units
   d. Cleaning with pre-treated disposable wipes

6. Which of the following describes a water-based, breathable, aliphatic coating that is available in low or high gloss sheen, clear, and/or pigmented?
   a. 1K waterborne acrylic latex, zero VOC
   b. 1K waterborne acrylic epoxy
   c. 2K waterborne polyurethane
   d. 2K waterborne epoxy

7. _____ , created by the EPA to address current COVID-19 disease disinfectants, is a list of products containing the specific disinfectant chemicals and contact times to control the virus.
   a. List A
   b. List N
   c. List C
   d. List V

8. For the purpose of the testing discussed, the 2K waterborne polyurethane with _____ gloss was used since it represented the aesthetic desires of the architectural and healthcare design community as well as the worst-case scenario in regards to durability for the facility owner.
   a. Low
   b. Medium
   c. High
   d. Semi

9. In independent odor testing, which paint or coating had the highest odor intensity at 4 hours?
   a. 1K waterborne acrylic latex, zero VOC
   b. 1K waterborne acrylic epoxy
   c. 2K waterborne polyurethane
   d. 2K waterborne epoxy

10. The testing results showed that the 2K waterborne polyurethane wall coating technology provides the best overall properties for combatting which major pain points of concern for hospital administrators?
    a. Odor
    b. Durability
    c. Cleanability
    d. All of the above

Designing the Outdoor Oasis

ENSURING CLIENT SATISFACTION THROUGH EFFECTIVE PROJECT MANAGEMENT

Presented By:

FORTRESS BUILDING PRODUCTS

LEARNING OBJECTIVES

1. Understand outdoor design trends and approaches and how outdoor spaces can increase home value.
2. Identify the role of project management in architecture and how architects can transition to project management roles using existing skillsets.
3. Discover best practices and challenges in outdoor space design, such as safety, moisture, and sustainability concerns, and how to enhance project value.
4. Evaluate the features and benefits of outdoor composite and PVC decking, metal deck framing and railing solutions, and outdoor LED lighting and how specifying the appropriate materials and products enhances client satisfaction and project success.

CONTINUING EDUCATION

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The home has always been a source of comfort. It's a sanctuary from the sometimes stressful and fast-paced lives that we lead. As homeowners come to expect more from their home in terms of functionality and design, architects have an opportunity to deliver solutions that enhance how homeowners interact with the built environment around them.

TRENDS IN OUTDOOR DESIGN

Homeowners' desire to bring the indoors out is increasing the demand for modern, sophisticated outdoor design solutions. They want the comfort of the indoor environment integrated into an outdoor space, as if the rooms flow effortlessly from one space to the other. Elements like outdoor kitchens, TVs, lighting design, and comfortable seating are all part of what can transform a common backyard into a retreat. Biophilic design, or the art of designing with nature, is another way that designers can change otherwise ordinary decks and patios into an at-home oasis.[1]

Demand for outdoor spaces is on the rise. It used to be that home offices were the most popular choice for homeowners who wanted to add a special function room to their house. While home offices remain in the top three in-demand choices, outdoor spaces have dominated the top spot consistently since 2017. An AIA survey in 2017 reported that 38 percent of architects saw outdoor spaces as the number one special function room, compared to just 23 percent for mudrooms and 16 percent for home offices. Between 2012 and 2017, demand for outdoor spaces increased by 72 percent. Part of this rise can

be attributed to an increase in discretionary spending and homeowners continuing to want to make the most out of existing spaces.[2]

And since the onset of the coronavirus pandemic in early 2020, staying home has been a requirement. It's likely that as more people stayed home and avoided public places, they have noticed areas of their home they want to improve. After the recession in 2008-09, the housing market saw a higher demand for smaller homes and lower demand for extra features. Now, post-coronavirus, for homeowners who have been able to work from home and continue making money, the temporary boost in discretionary income—due to factors like not driving to work, shopping, or eating out—is considered to be a driving force behind a future uptick in home renovation projects.[3]

Already, DIYers have been hard at work. Since mid-March 2020, home renovation projects like painting and improvements to outdoor living have experienced the biggest upticks.[4] These early indicators support a continued investment in outdoor spaces as households recover from the coronavirus pandemic.

What Do Homeowners Want from Their Outdoor Spaces?

Pre-pandemic, a few design trends emerged that architects could use to create stunning outdoor spaces for their clients. Sustainability, entertainment, multi-functional spaces, and integrating the outdoors with the interior are all dominating homeowner preferences.

Especially in urban or suburban environments, incorporating plenty of green space into an outdoor oasis is a must. Whether it's thoughtful landscaping, hanging plants, living walls, or more artistic inclusions like natural-looking materials can help to achieve a look that is integrated with nature and sustainable at the same time. Color schemes featuring warm tones and soft shades are being used alongside pops of color in accessories like decorative lighting, rugs, furniture, and more.

Beyond the color schemes and design aesthetic, decking and railing are getting more attention, too. Aluminum railings are becoming more popular for their durable, low-maintenance characteristics combined with a timeless look that fits into any outdoor living space. The surfaces we walk on are no longer being seen as afterthoughts. Instead, decking materials that create stylish surfaces and subtle patterns give homeowners more flexibility to incorporate design elements into the flooring. Landscape lighting is gaining traction as well. It's a necessary functional element for safety, but strategically placed outdoor lighting can do more than provide illumination; it can highlight other architectural and design elements in the space.[5]

BEST PRACTICES FOR OUTDOOR DESIGN

When architects are designing outdoor spaces for homeowners, they need to be

GLOSSARY

Biophilic Design: The art of designing with nature; derived from "biophilia," which translates literally to 'love of nature.'

Composite Decking: New options of composite and PVC decking eliminate early challenges of moisture absorption and slippage; made to resemble natural wood and is up to 45% lighter and two times stronger than earlier composite choices.

Hardscaping: Non-living elements of landscaping, such as decking, railing, walls, and other built structures.

POE (Post Occupancy Evaluation): A study at various intervals after the design project is completed; the purpose is to understand how users actually interact with the space and evaluate various elements.

Project Management: The practice of leading a team to achieve a certain outcome within a specified period of time; four main project phases are planning, build-up, implementation, and closeout.

Sustainable SITES Initiative (SITES): A comprehensive rating system used by landscape architects, designers, and others to align land development and management with innovative sustainable design. Administered by Green Business Certification Inc. (GBCI).

Site Planning: Involves reviewing the site's terrain, any current structures, environmental factors, and local area, such as local vegetation and existing architectural elements.

Softscaping: Living elements of landscaping, such as flowers, plants, shrubs, and trees, as well as grading, planting, digging, and anything else required for the maintenance of horticultural elements.

Work Breakdown Structure (WBS): A project management tool that aids in determining scope and project tasks by breaking project components down into smaller tasks.

Xeriscaping: Also called "desert landscaping," it's the process of utilizing hardscaping or gardening that reduces or eliminates the need for extra water to maintain the space.

thinking about how the space can be utilized and what the homeowner intends to do in it. Multi-functional spaces increase the ways that occupants can interact with the space, whether it's to relax, entertain, or play. To that end, finding out the family's vision will help designers create a space that is functional, beautiful, and creative, and exceeds the homeowners' expectations.

A few ways to maximize the use of outdoor spaces include lighting, umbrellas or movable shade walls/screens, outdoor fireplaces, built-in seating, vertical planters, and more.

Because outdoor spaces are an extension of the indoor home, the best place to start when designing a project that will exceed homeowners' expectations is to understand the buyer and the budget. To the points above, creating a multi-functional space starts with an understanding of the client's lifestyle, as well as current and future needs. For example, perhaps a young couple is planning on starting a family soon, so their outdoor space would need to incorporate areas for play as well as safety features, along with space to entertain. Whatever the client wants to do with the space, design accordingly. Maximize the features in relation to the entire home, and don't over clutter with lots of furniture or accessories.

It's also important to design for seasonality and activity. For example, positioning an outdoor TV or grilling center to the south for better sunlight, and also consider whether coverings will be needed. Design features that tie into an activity will help homeowners utilize the space better, too. It is in this area that elements like furniture, materials, flooring, and fabrics can really shine.

When designing outdoor spaces, incorporate seamless transitions from the indoors out, and vice versa. The space needs to be convenient, comfortable, and accessible for homeowners. ADA requirements still need to be followed for residential outdoor design projects, as well as any other local building codes. Landscaping and site planning work together to tie the outdoors to the built environment as well as the exterior surroundings. Take care to evaluate the site and take advantage of available views and daylights, and work with a civil engineer when necessary to develop appropriate grading and drainage.[6]

Another consideration is *where* the outdoor space is. It doesn't have to be in the back yard. Side yards and front patios have become more popular, especially among homeowners with little useable space for a back yard. Side and front configurations can also help increase a home's curb appeal.[7]

HOW OUTDOOR SPACES INCREASE HOME VALUE

Homeowners' desire to upgrade their outdoor spaces varies widely. A new homeowner is more likely to want to add outdoor landscaping and hardscaping to 'frame' the house and up its curb appeal. Homeowners trying to sell are looking to increase home value. Design sophistication has been considered the most important landscaping factor and has been shown to increase home value the most (compared to simple landscape designs), allowing architects to step in and create stunning outdoor spaces for clients.[8]

During the beginning stages of a new outdoor design project, it's helpful for architects to remind homebuyers that outdoor spaces increase a home's value. According to 2019 national averages for remodeling projects, the following outdoor design projects can expect to recoup the following amounts and resale value.[9]

- Wood Deck Replacement: 75.6% cost recouped and $10,083 resale value
- Composite Deck Replacement: 69.1% cost recouped and $13,232 resale value
- Backyard Patio: 55.2% cost recouped and $31,430 resale value

There are multiple measurements and indexes that rank different outdoor design projects. Smaller scale patio projects can actually increase resale value, and another report estimates that a 14x18 deck with railing, stair treads, and sealer can recover about 80 percent of the project cost at resale. A new patio is one of the outdoor remodeling projects that give homeowners the greatest desire to stay at home, in addition to landscape upgrades, according to the National Association of Realtors and NALP.[10] And good landscape design can add 5 to 11 percent of perceived value to a home.[11]

Outdoor kitchens, irrigation systems, and water features are popular among luxury homes. Hardscaping projects can be found in any price range but are much more common in high-end outdoor spaces. Sustainable hardscaping elements like permeable pavers and low-maintenance landscapes create more value for homeowners. Hardscaping and landscaping add the most value when used together. Used in combination, they allow homeowners to imagine more uses for the outdoor space. Just as hardscaping cuts down on lawn maintenance, certain types of landscaping provide privacy, protection from the wind, and shade in the summer. The value of both elements is needed for a truly standout space.

Another type of outdoor design is more prevalent in dry climates. Xeriscaping is similar to hardscaping, except that it focuses on using less water and native plants. Xeriscaping can save a home's water use by up to 60 percent, according to some sources, and in some states it can even offer homebuyers a rebate program that pays them a certain amount per square foot when grass is replaced by "desert landscaping."

In general, landscaping allows a homeowner to recoup nearly 100 percent in project costs. Plus, landscaping increases the privacy of an outdoor space, which is helpful in urban environments. Fire pits are an in-demand feature, but local code restrictions might dictate where—and *if*—a fire pit can be installed.[12]

When it comes to choosing the right kind of outdoor design for a specific home, a good strategy is to match the landscaping and hardscaping to the home's architectural style. Homeowners can expect to spend about 10 percent of their home's value on outdoor living spaces; if this number isn't feasible, simply adding color and edging with landscaping along with maintaining the lawn will provide a quick, inexpensive fix.[13]

In considering ways to add home value and homeowner enjoyment, maintenance-free materials are a must. Wood decking may recoup more project costs than composite decking, on average, but quality composite decking is much easier to maintain. There is no sealing, sanding, staining, or painting required. It is scratch- and fade-resistant and comes in a variety of price points. Newer composite decking materials are co-extruded to resemble the look of wood without any of the upkeep, and it comes in several colors and finishes to complement any outdoor design project.[14]

This article continues on http://go.hw.net/AR082020-1. Go online to read the rest of the CEU course, complete the corresponding quiz for credit, and receive your certificate of completion.

QUIZ

1. According to the course, how much has the demand for outdoor spaces increased in recent years?
   A. 70 percent
   B. 72 percent
   C. 75 percent
   D. 80 percent

2. Approximately how much can a 14x18 deck with railing, stair treads, and sealer recover at resale?
   A. 80 percent
   B. 75 percent
   C. 78 percent
   D. 65 percent

3. In the four phases of project management, what is the second phase?
   A. Planning
   B. Strategy
   C. Build-Out
   D. Build-Up

4. Time, cost, and _____ are three variables that can impact the outcome of a project.
   A. Team members
   B. Availability of materials
   C. Quality
   D. Client feedback

5. When considering the four most common problems that can arise that threaten an entire project, which one does NOT belong?
   A. Budget
   B. Time slippage
   C. Quality issues
   D. People problems

6. According to the course, how many square feet are recommended per person in an outdoor space?
   A. 4 square feet without furniture, 12 square feet with furniture
   B. 5–6 square feet without furniture, 10 square feet with furniture
   C. 5–6 square feet without furniture, 12 square feet with furniture
   D. 6–8 square feet without furniture, 12-14 square feet with furniture

7. Two primary ways to avoid a "design fail" are to design with the user in mind and _____.
   A. Talk to the customer
   B. Consult the Post Occupancy Evaluations for similar projects
   C. Finish on time and within budget
   D. Give the customer more than they asked for

8. Problems with wood decking can include:
   A. Slippage
   B. Warping
   C. Erosion
   D All of the above

9. According to the course, how much lighter is new composite and PVC decking compared to first generation composite?
   A. 45 percent
   B. 40 percent
   C. 50 percent
   D. 35 percent

10. Two options for outdoor LED lighting to save energy and extend useful life include a _____ and _____.
    A. Wireless remote and timer
    B. Photocell and timer
    C. Touch controls and photocell
    D. Premium transformer and touch controls

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The Top 10 Ways to Reduce Concrete's Carbon Footprint

Presented By:

BUILD WITH STRENGTH

960 W. 7th Street, Los Angeles. The design and construction team implemented several Top 10 strategies to reduce the embodied carbon of concrete for this new residential tower in Los Angeles. Photo: Courtesy of Brookfield Properties.

INTRODUCTION

Concrete is unique among building materials. Its formulation is highly influenced by its application. Design professionals and contractors have a greater influence on concrete formulation than they do with other building products. Concrete can be made stronger, lighter, more flowable, stiffer, less permeable, and even weaker depending on performance needs. All these formulations can be made at the same factory, within minutes of one another. No other building material is that versatile. Concrete does not rot, rust, or burn. It can be exposed to the elements or exposed for architectural reasons. Concrete is economical, available nearly everywhere, and made from the most abundant materials on the planet, usually from local sources.

Concrete is used for the tallest buildings, the longest bridges, the largest buildings, the busiest airports, the most efficient rapid transit systems, roadways, theaters, stadiums, schools, apartment buildings, and houses. Drinking water is transported in concrete pipes and reservoirs, and waste is treated in wastewater treatment plants made of concrete. Concrete is used in nearly every structure where people live, work, learn, and play. It is part of the infrastructure that connects us. It's the material that helped build modern society and will likely be part of improving modern society for some time.

According to UN Environment, Global Status Report 2017, the world is projected to add 320 billion m^2 (3.4 trillion ft^2) of buildings by

LEARNING OBJECTIVES

1. Understand the basics of embodied carbon of concrete.
2. Evaluate the immediate steps that can be taken to reduce carbon footprint when specifying concrete.
3. Prioritize design strategies to get the greatest reductions in carbon footprint using current technologies and design tools.
4. Explore how innovative technologies will result in zero carbon concrete in the future.

CONTINUING EDUCATION

AIA CREDIT: 1.5 LU/HSW

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2060. That's an area equal to 1.4 times the entire current global building stock. The UN report urges building designers and owners to design disaster-resilient buildings for the future, with zero-energy consumption. Because of its thermal mass, concrete has long been the material of choice for energy efficiency, and because of its strength and durability, it has been the material of choice for disaster resilience. However, the UN report also urges the building industry to reduce the embodied impacts of building materials.

This article will discuss how design and construction teams can implement ten simple strategies to reduce concrete's carbon footprint today. The recommendations are listed broadly in order of priority, but not in order of impact reduction. All are important and should be implemented. In addition, the strategies are meant to achieve a lower carbon footprint without impacting other traditional performance criteria for concrete.

THE TOP 10 LIST

1. Communicate carbon reduction goals
2. Ensure good quality control and assurance
3. Optimize concrete volume
4. Use alternative cements
5. Use supplementary cementitious materials
6. Use admixtures
7. Don't limit ingredients
8. Set targets for carbon footprint
9. Sequester carbon dioxide in concrete
10. Encourage innovation

IMPLEMENTING THE TOP 10 CARBON REDUCTION STRATEGIES

1. COMMUNICATE CARBON REDUCTION GOALS

One of the basic tenets of achieving a goal is to effectively communicate that goal to everyone on the team. For concrete, that is especially important because there are so many parameters and criteria for concrete mixtures that the goal of reducing embodied carbon may get lost in the clutter.

Drawings and specifications are the primary means through which project goals are communicated to the owner, contractor, and product suppliers. When it comes to embodied carbon, product manufacturing is paramount. Therefore, sustainability goals should be communicated to product manufacturers. This not only applies to concrete but to the majority of building products.

Most product manufacturers bid on a project armed with a set of drawings and are often only provided the section of the specification affecting their work. For concrete, that is section 03300. However, in many instances the sustainability related requirements are placed in section 01000. If a concrete contractor and product manufacturer do not see Section 1 of the specification, then they will be unaware of any carbon reduction goals regarding concrete.

Recommendations

Collaborate

Collaborate with concrete producers and contractors. Invite them in for a meeting or charrette with your design team. Understand what technologies and concrete ingredients are available locally. Just because a product (slag cement for example) isn't generally used in a market, it doesn't mean you should not specify or prohibit its use. Generally, the reason a product is not used is because there is no demand for it. You need to create the demand by permitting and encouraging its use.

Specification

SECTION 03300—CAST-IN-PLACE CONCRETE
PART 1—GENERAL
1.1 SUSTAINABILITY GOALS

A. This project has a goal of reducing the embodied carbon footprint over a typical project by 20%*. To accomplish this goal, we are targeting a carbon footprint reduction for concrete of 35%* over benchmark established in the concrete industry's Cradle-to-Gate Life Cycle Assessment Version 3.[1] Specific targets for Global Warming Potential (GWP) are provided in Section 2, CONCRETE MIXTURES. To accomplish this goal, we are encouraging the use of innovative products and processes for manufactured concrete and will consider proposals for mix designs that can demonstrate they meet all performance criteria for strength, durability, constructability, and cost in addition to reducing carbon footprint.

* These values are for demonstration purposes only.

GLOSSARY

Blended cements—combine ordinary portland cement (OPC) with other materials; the most common is portland limestone cement (PLC).
Environmental Product Declaration (EPD)—an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products.
Life Cycle Assessment (LCA)—compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.
Portland-Limestone Cement—blended cement combines up to 15% limestone interground with OPC to make a cement with a carbon footprint that is up to 10% lower than OPC with performance that is identical to—and in some cases better than—OPC.
Supplementary Cementitious Materials (SCMs)—can be used for improved concrete performance in its fresh and hardened state. They are primarily used for improved workability, durability, and strength. These materials allow the concrete producer to design and modify the concrete mixture to suit the desired application.
Sustainable Development—meeting the needs of the present without compromising the needs of future generations
Type IL (X)—portland-limestone cement where "X" can be between 5 and 15% limestone.
Type IS (X)—portland-slag cement where "X" can be up to 70% slag.
Type IP (X)—portland-pozzolan cement where "X" can e up to 40% pozzolan (fly ash is the most common).
Type IT (X) (X)—ternary blended cement where "X" can be up to 70% of pozzolan +limestone + slag, with pozzolan being no more than 40% and limestone no more than 15%.

Pre-bid Meeting

It is also important to communicate carbon reduction goals in other ways. Most projects have pre-bid meetings, which can be opportunities to communicate carbon reduction goals for all products to all potential bidders.

2. ENSURE GOOD QUALITY CONTROL AND ASSURANCE

This is important for all products, but it's especially critical for concrete. Concrete is made from local materials and its performance

can be affected by weather conditions, variability of materials, delivery, placing, handling, and testing. Although the materials used to make concrete meet rigorous standards, the variability can be quite high.

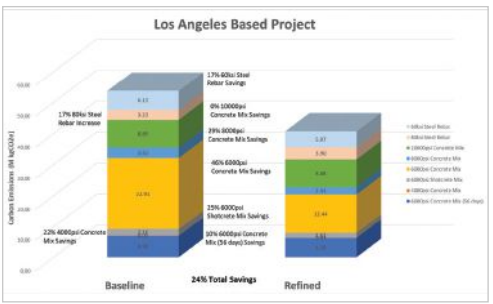
Quality Control

Almost all concrete has compressive strength as one performance criterion. Concrete producers design concrete mixtures to meet the needs of the contractor in terms of workability (flowability, pumpability, finishability, etc.) based on their local aggregates, and then using sufficient quantity of cementitious materials—usually a combination of portland cement and supplementary cementitious materials—to achieve the required compressive strength, which is higher than the specified compressive strength. The "overdesign" (the difference between the actual average compressive strength and the specified compressive strength) is based on well-established statistical methods described in the codes and standards for concrete. If a concrete producer has a good quality control process and a history of consistent test results for a mix design, the overdesign can be relatively small, say 400 to 600 psi for 4,000 psi concrete. But if quality control is poor, or there is no history of test results, then the overdesign can be much higher: 1,200 psi or higher for 4,000 psi concrete.

Lower overdesign means lower cementitious materials content. For example, going from 1,200 psi to 600 psi overdesign would likely require 60 lbs less cementitious material, potentially an 8% decrease in embodied CO_2. The key here is to minimize the overdesign through good quality control. Having manufacturing equipment in good working order, using proven quality

CASE STUDY: 960 W. 7TH STREET, LOS ANGELES

Developer: Brookfield Properties
Design Architect: Marmol Radziner
Executive Architect: Large Architecture
Structural Engineer: MKA
Contractor: Webcor
Concrete Supplier: National Ready Mixed Concrete Company
Photo: Courtesy of Brookfield Properties



Background

960 W. 7th Street is a distinctive multifamily high-rise development located in the heart of downtown Los Angeles. This 64-story tower has 780 residential units totaling 807,000 square feet.

Challenges

Projects of this magnitude have challenges when it comes to balancing cost, long term value, energy efficiency, occupant comfort and sustainability. The design team, developer, contractor and product suppliers need to have the same goals in mind when it comes to reducing environmental impact, including carbon footprint.

Sustainable Solutions

Structural engineers play a key role in selecting the structural system for most buildings, especially for a high-rise in a high seismic zone. In working with the design team to best meet project goals, the engineering firm proposed cast-in-place post-tensioned slabs, with a centralized buttressed concrete core that tapered with height. This system optimized floor to floor heights, eliminated transfers, and worked with unit and public spaces to optimize net/gross floor ratios while preserving unobstructed views at the building perimeter. The firm's optimization also included Performance Based Seismic Design, and 80 ksi rebar wherever it led to a material reduction.

They also developed a low carbon performance-based specification and procurement strategy with the architect and developer, which worked closely with the use of the new Embodied Carbon Construction Calculator (EC3) tool. They used BIM to quantify material quantities and to estimate the embodied carbon of those materials, which were measured using industry average EPDs during design, and product specific EPDs whenever possible after product suppliers became known. "After you know your quantities, the math for performance oriented like material comparisons is simple," states Don Davies, president of the engineering firm. "It's as straight forward as multiplying material quantities by their carbon footprint from comparable EPDs and adding it up. This is becoming increasingly easier for concrete, where today there are over 23,000 EPDs within the EC3 tool database. That the EC3 tool assesses the variability of those EPDs to make like comparisons more reliable is a big key to the credibility of what we then report."

Engagement with the contractor and concrete supplier early on also helped "tighten-up" the mix designs, where the single change of the aggregate being used, moving to imported and higher quality aggregates, improved quality control and variation in the mix performance, allowing the same specified compressive strength reliability to be achieved with a lower quantity of cementitious materials. They worked with the contractor to determine where faster strength gain was really needed and adjusted testing age accordingly to accommodate higher volumes of SCMs.

"We reduced 24% of the total project embodied carbon footprint, at no cost add, that's after accounting for the carbon from barging rock from the Pacific NW down to LA," says Davies. "On the PT slab mixes alone, we reduced the carbon footprint of that mix by 47%."

"Asking targeted questions and measuring the carbon data at the time of procurement can have significant impacts," adds Davies. "Just remember you can't manage what you don't measure."

management principles, and qualified personnel who can design, manage, and manufacture quality concrete consistently equate to good quality control.

Quality Assurance

Testing concrete is not an exact science. Every project has specifications that require independent testing laboratories to ensure that concrete meets the specified performance criteria. Placing concrete is a dynamic process and thus sampling concrete for testing can be challenging. There are well established procedures for taking concrete samples, preparing test specimens, storing them on site, transporting them to a laboratory, and finally testing them in a compression testing machine or other apparatus. If sampled and prepared incorrectly, stored incorrectly, transported incorrectly, and tested incorrectly, the results are meaningless. This also impacts the perceived variability that impacts the overdesign the producer is permitted for future projects.

This article continues on http://go.hw.net/AR082020-2. Go online to read the rest of the CEU course, complete the corresponding quiz for credit, and receive your certificate of completion.

SPONSOR INFORMATION

Build with Strength, a coalition of the National Ready Mixed Concrete Association NRMCA, educates the building and design communities and policymakers on the benefits of ready mixed concrete, and encourages its use as the building material of choice. No other material can replicate concrete's advantages in terms of strength, durability, safety and ease of use.

QUIZ

1. According to UN Environment, Global Status Report 2017, the world is projected to add 320 billion m^2 (3.4 trillion ft^2) of buildings by_____. That's an area equal to 1.4 times the entire current global building stock.
   a. 2060 b. 2070
   c. 2080 d. 2090

2. According to the course material, which of the following is part of the Top 10 List in the course?
   a. Communicate carbon reduction goals b. Don't limit ingredients
   c. Encourage innovation d. All of the above

3. In the case study that examines 960 W. 7th Street in Los Angeles, ____of the total project embodied carbon footprint was reduced through the use of SCMs.
   a. 10% b. 12%
   c. 19% d. 24%

4. Type IL cement, portland-limestone cement, can be between 5 and ____ limestone.
   a. 15% b. 25%
   c. 35% d. 50%

5. Type IL blended portland-limestone cement with _____ limestone was used on the North Torrey Pines Living and Learning Neighborhood project.
   a. 5% b. 10%
   c. 13% d. 15%

6. Which of the following is the most commonly used supplementary cementitious material?
   a. Slag cement b. Fly ash
   c. Silica fume d. None of the above

7. A 10% increase in cementitious materials content for 4000 psi air entrained concrete compared to non air-entrained concrete of the same strength would roughly translate to a _____ increase in carbon footprint for the concrete.
   a. 8% b. 9%
   c. 10% d. 11%

8. In the Oracle case study, the project reduced Global Warming Potential by _____ from baseline.
   a. 9% b. 10%
   c. 11% d. 12%

9. Research conducted by Possan, et al., indicates that during its lifetime, concrete can uptake anywhere from 40 to 90% of CO_2 emitted in its manufacturing process. In some cases, considering a structure's demolition (leaving crushed concrete exposed to air), its uptake can approach _____.
   a. 95% b. 96%
   c. 98% d. 100%

10. The rates of CO_2 uptake in concrete is greatest when:
    a. Concrete is painted b. Concrete is crushed and exposed to air
    c. Concrete is sprayed with water d. Concrete is post-tensioned

11. The term, ____, is defined as a naturally occurring process which CO_2 penetrates the surface of hardened concrete and chemically reacts with cement hydration products to form carbonates.
    a. Carbonation b. Oxygenation
    c. Deterioration d. Fenestration

12. According to the course's Top Ten Ways, which is cited by the author as the most difficult?
    a. 2—Ensure good quality control and assurance b. 5—Use supplementary cementitious materials
    c. 9—Sequester carbon dioxide in concrete d. 10—Encourage innovation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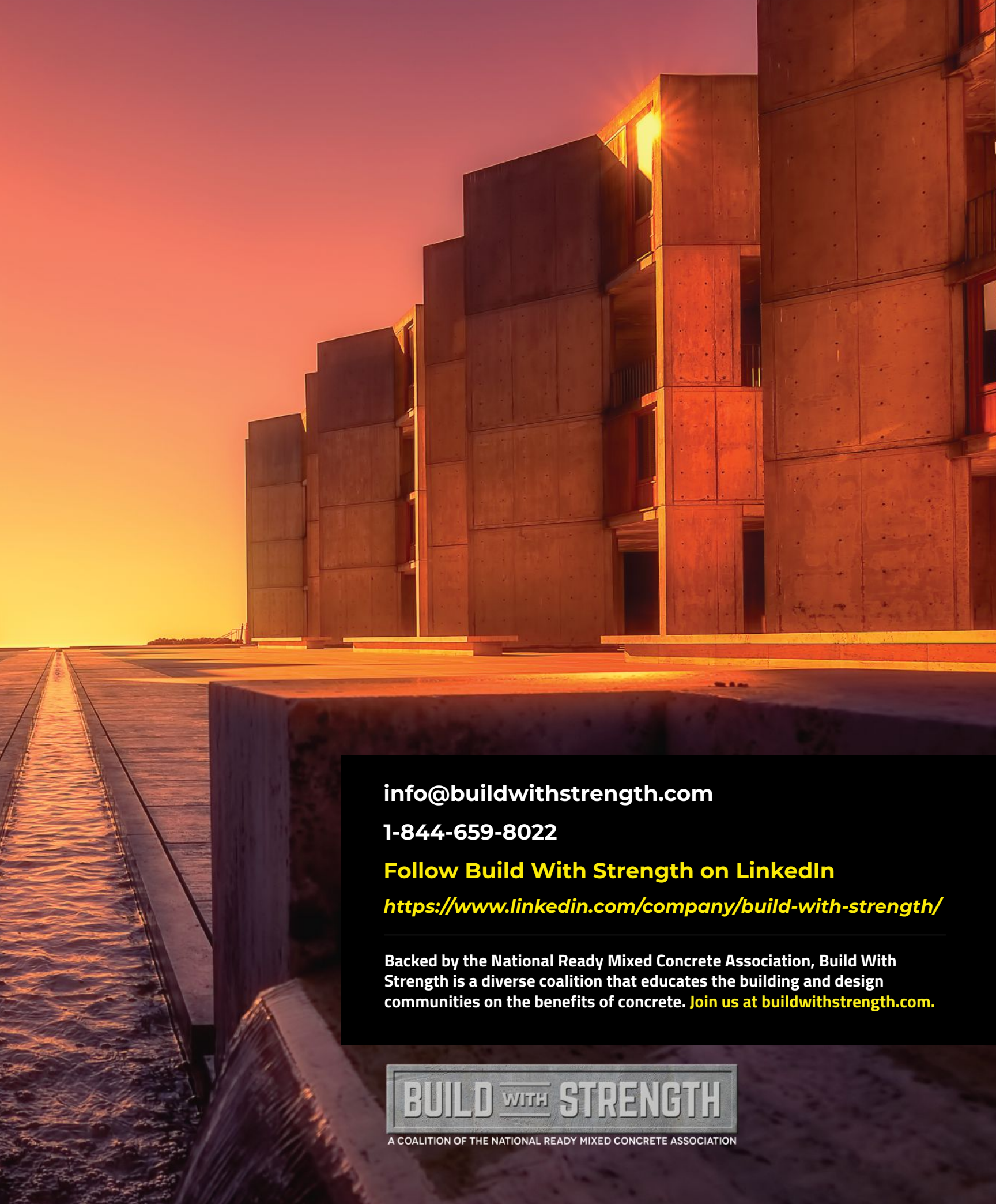


WOOD AND EVOLVING CODES: THE 2018 IBC AND EMERGING WOOD TECHNOLOGIES

BUILDING CODES ARE EVOLVING TO SUPPORT NEW TECHNOLOGICAL DEVELOPMENTS FOR ONE OF OUR OLDEST BUILDING MATERIALS

Presented by: THINK WOOD®

Designers are taking advantage of innovative wood products that showcase the natural beauty of wood. Photo: Jeremy Bitterman, courtesy of LEVER Architecture

LEARNING OBJECTIVES

After this reading this article, you should be able to:

1. Discuss provisions in the International Building Code (IBC) intended to ensure that wood buildings provide an acceptable level of safety.
2. Evaluate techniques that make it safe for designers to increase heights and areas of building projects beyond IBC base limits.
3. Identify the advantages of wood-frame and mass timber structures during hazardous events.
4. Explain how advances in wood products and building systems are influencing the evolution of building codes.

CONTINUING EDUCATION

AIA CREDIT: 1.5 LU/HSW
AIA COURSE NUMBER: THINKWOOD.2

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/ThinkWood-2 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

By Andrew A. Hunt

Increasingly, designers, builders, and building owners are turning to one of our oldest building materials: wood. Valued for its versatility, low carbon footprint, and aesthetic qualities, not to mention its cost performance, wood has long been a preferred choice for constructing durable structures that are resilient in the face of hazardous conditions. However, in modern times, structural wood has been largely confined to residential and low-rise commercial construction, despite its proven structural performance and ability to endure seismic and wind events. Recent innovations and subsequent code changes are expanding the use of structural wood beyond these established sectors.

Using wood in nonresidential buildings is not a completely new idea, but rather a revival. Innovative new construction techniques are expanding the use of lumber; these techniques utilize engineered wood products such as cross-laminated timber (CLT), nail-laminated timber (NLT), dowel-laminated timber (DLT), and structural glued-laminated timber (glulam). These "mass timber" products have great structural capability and inherent fire resistance, and interest in mid-and even high-rise wood buildings that incorporate these technologies is growing rapidly in Canada and the United States. Testing and validation of these products, in addition to many new examples coming online, is driving increasing confidence from both the public and local code authorities. Recent code changes reflect the growing body of research that validates these systems for structural performance and for contribution to life safety during extreme events, such as fires, hurricanes, and earthquakes.

THE CODE UPDATE PROCESS

When the International Building Code (IBC) was introduced in 2000, it consolidated three regional model building codes into one uniform code that has since been adopted by most jurisdictions. It increased the possibilities for wood construction by (among other things) recognizing additional fire protection techniques, consolidating the maximum allowable areas and heights from the three legacy codes into one (thus increasing what's allowable in some jurisdictions), and allowing the use of wood in a wider range of building types. In subsequent versions of the IBC, even more opportunities have been created where additional fire protection features are used. Even so, the pioneering nature of building design is such that there are always architects and engineers seeking to innovate, and it is common for project teams to request (and be granted) variances for designs not covered by the code that nonetheless meet its intent and provide accepted levels of safety. Given the code's three-year amendment cycle, this performance pathway is necessary to keep pace with advancements in building systems, materials, and construction practices.

The 2018 IBC was recently published, and states and local jurisdictions will soon begin adopting it; however, the code landscape is uneven, and many states and jurisdictions are following IBC 2015, 2012, or even older versions of the code. The 2018 IBC references newer versions of

Nail-laminated timber, which consists of dimension lumber stacked on edge and nailed together, is one of several engineered wood products being used in today's buildings. Image courtesy of Think Wood

important standards. One of these is ANSI/AWC NDS-2018: National Design Specification for Wood Construction. Produced by the American Wood Council (AWC), this resource was first issued in 1944. Today, it includes requirements for design of a full range of wood products based on up-to-date research and testing, and it is used to guide design of wood structures around the world.

NDS 2018 itself references ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures. This important resource, published by the American Society of Civil Engineers (ASCE), describes the means for determining dead, live, soil, flood, tsunami, snow, rain, atmospheric ice, earthquake, and wind loads, and their combinations for general structural design. It is widely referenced by building codes.

While the IBC is updated on a three-year cycle, the ASCE 7 is typically on a six-year cycle. The NDS is updated at least every six years, but sometimes more often to address new load provisions developed by ASCE 7 or new products such as CLT.

Advocating for Change

Although the International Code Council (ICC) and the building industry in general have long recognized the benefits of wood as a building material, emerging technologies such as CLT are still new to many people, and until the 2015 IBC, they were not explicitly introduced into building codes.[1]

It's important to understand that mass timber systems and technologies such as CLT have been fully tested and verified and are allowed under current codes. Fortunately, architects, engineers, developers, building owners, and others are championing CLT and other new uses of wood, including light frame, and sharing resources and research to support this burgeoning interest in mass timber building design, including the use of wood in taller buildings. The Think Wood Research Library, an online database that includes nearly 1,000 research documents, can help architects, engineers, and other industry professionals design and build safe, high-performing wood structures. The research contained in the database covers seismic, fire safety, and other performance aspects of wood members and systems. The library also includes reports and research papers on other design topics, including acoustics and vibrations, energy and environment, and building codes and cost.

Another specific resource for designers seeking to design code-compliant wood structures is the 2015 Code-Conforming Wood Design (CCWD). Produced in partnership with the ICC, the AWC developed this document to demonstrate that modern building codes allow large, multistory wood buildings in many common occupancy uses with nothing more than a basic understanding of key code provisions required.

CCWD summarizes the most common requirements for wood construction in commercial buildings according to the 2015 IBC. A new version of CCWD based on the 2018 IBC is currently in development.

In this quickly evolving industry, a number of individuals and entities, including engineering firms, academic institutions, standards organizations such as the National Fire Protection Association (NFPA), and government research organizations such as the U.S. Forest Service Forest Products Laboratory, have been driving innovation with testing that demonstrates and improves upon the structural, seismic, wind, and fire safety performance of mass timber. These efforts have led to a great deal of new information in a short period of time, and these groups are committed to sharing this information in order to drive best practices in this emerging field.

To promote and facilitate code changes based on the building science of taller wood buildings, the ICC approved the creation of the Ad Hoc Committee on Tall Wood Buildings in 2016. This balanced group includes building officials, fire officials, architects, fire protection engineers, and industry experts. "Tall wood" is an industry term that refers to the use of wood products in buildings greater than six stories; hence, the committee was charged with investigating the feasibility of and taking action on developing code changes for tall mass timber buildings. Since its formation, the Committee on Tall Wood Buildings has reviewed extensive literature on tall wood buildings, including the results of domestic and international testing. The committee has proposed 14 code changes for the 2021 IBC cycle.2 (A summary of these proposed changes can be viewed at www.awc.org/tallmasstimber)

FIRE PROTECTION

To understand the building codes' fire protection provisions, it's important to remember that codes divide construction into five types:

- **Type I and II:** All building elements must be noncombustible.
- **Type III:** Exterior walls must be of non-combustible materials.
- **Type IV (Heavy Timber):** Exterior walls must be of noncombustible materials, and interior building elements are of solid or laminated wood without any concealed spaces.
- **Type V:** Exterior walls, interior walls, and structural members may be of any material permitted by code.

The IBC and ICC require all building components within a particular type of construction to provide the same level of fire protection regardless of materials used. As a starting point, the IBC specifies a basic allowable area based on a single story, the type of construction, and occupancy classification. It then permits increases to allowable areas based on features of the building, including the addition of an automatic sprinkler system, side yard open space, fire walls, augmented exiting, and additional stories.

For example, the code allows low-rise, two-story business and mercantile buildings of wood construction to be of unlimited area when they are equipped with an automatic sprinkler system throughout and have 60 feet of fire-separation distance between the building and all property lines. Residential wood buildings with sprinklers and exterior walls made from fire-retardant-treated wood (FRTW) can be up to five stories in height and have additional "levels" when mezzanines are included. Under the 2018 IBC, mezzanines are permitted to have a floor area up to one-third of the floor area below and considered part of that story, and under certain conditions in dwelling units can be up to one-half of the floor area of the

CHANGES FOR WOOD DESIGN AND CONSTRUCTION IN THE 2018 IBC

As a construction material, wood provides numerous advantages over other materials, ranging from lower cost, improved energy efficiency, and better environmental footprint to unique design options. Unfortunately, many designers and builders consider the codes and standards for using wood to be too complex, and that means they opt for other materials. The AWC has partnered with the International ICC to make those codes and standards more accessible. Here, we will discuss changes concerning wood in the 2018 IBC in regards to fire protection, heavy timber and mass timber, and construction type information.

Types of wood construction: Wood can be used in traditional structural applications such as roof, floor, and wall framing but also other components such as foundations, doors and windows, exterior and interior finishes, trim, siding, roofing, and decking. The three predominate types of construction where wood construction is permitted by the code include Types III, IV, and V. Types I and II permit wood in certain limited circumstances.

- Type III is used primarily for multifamily residential buildings, and the code requires that exterior wood walls have a 2-hour fire rating (or less if combined with noncombustible wall coverings). Type IIIA must include 1-hour fire-resistance-rated floors and roofs, while Type IIIB can have unrated floors and roofs.
- Type IV construction, also known as "heavy timber construction," is becoming increasingly popular in part because of its inherent fire-performance characteristics. The 2015 IBC was the first edition to recognize a new mass timber product called cross-laminated timber, or CLT, which consists of three, five, or seven layers of solid dimension lumber that are stacked crosswise and glued together. The inclusion of CLT has helped builders become more aware of the product's benefits, including its performance in a variety of buildings. The economic, environmental, structural, and fire-resistance benefits are a winning combination for Type IV construction.
- Type V construction permits wood or other approved materials for structural elements, with two subcategories: Type VA, which requires 1-hour fire-resistance-rated structural members and assemblies, and Type VB, which has no required fire-resistance rating. Type VA is a practical option for floor, roof, and wall assemblies because its 1-hour fire-resistance rating is cost effective, and there are no special restrictions on materials used in exterior walls. Type VB, however, is the most flexible in terms of wood-frame structures, but that's because it doesn't have any required fire-resistance ratings. That said, points of egress will have fire-resistance requirements.

Three Main Categories:

1. Noncombustible (Types I and II)
2. Light-Frame (Types III and V)
3. Mass Timber (Type IV)

IBC TABLE 601

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B

In Table 601, the IBC outlines the required fire-resistance rating of building elements based on the type of construction.

Fire protection: As for fire resistance, the IBC outlines, in Table 601, the required fire resistance of building elements, such as structural frames, floors, walls, and roofs, all based on construction type. The hourly fire-resistance rating increases for taller buildings.

Fire testing for wood-frame building assemblies is established in ASTM E 119: Standard Test Methods for Fire Tests of Building Construction and Materials or the corresponding UL standard.

Chapter 16 of the NDS outlines methods for calculating up to 2 hours of fire resistance for commonly used timber and engineered wood projects, such as glulam, structural composite lumber (SCL), and CLT. Another resource is AWC Technical Report (TR) 10: Calculating the Fire Resistance of Exposed Wood Members; this resource has background and example calculations for designing exposed wood members per the NDS.

room below. The code also permits the use of wood for many features in buildings required to be of a noncombustible construction type, often even whole roof structures, based on other safety features.

Under the 2018 IBC, designers can use fire walls to create separate building portions that do not exceed the height and area limits set by code. This option can be exercised when sprinklers either aren't an option or don't afford the necessary increases for the project's use and site characteristics. In Type V Construction, fire walls are permitted to be of wood-frame construction, allowing designers to divide the structure into separate buildings for purposes of size, each subject to its own height and area limits.[3] Therefore, the size of a building can theoretically be doubled while maintaining the same construction type.

In addition to sprinkler and open frontage increases, a designer's options also include increasing to a higher type of construction, which might include the use of fire-resistive construction throughout the building, fire-retardant-treated lumber for exterior walls, or heavy timber construction.

Rated Assemblies

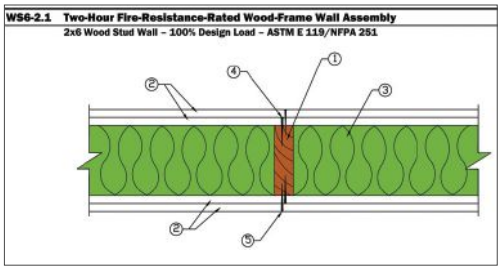
There are several types of fire-resistive assemblies and components within a building. These include vertical assemblies (walls), horizontal assemblies (floors and roofs), and structural frame members (columns and beams). In most cases, these components and assemblies are required to have either a 1- or 2-hour fire-resistive rating. Fire-resistive construction is typically designated as the number of hours a representative test assembly or component will resist a standardized fire exposure when tested in a laboratory. One of the standards used for measuring fire resistance of building assemblies is ASTM E 119.

IBC Section 703.3 provides several methods for determining fire resistance of building elements, including but not limited to the following:

1. Fire-resistance designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated building elements, components, or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.

Approved sources include documents such as AWC's Design for Code Acceptance (DCA) series. DCA 3: Fire-Resistance-Rated Wood Floor and Wall Assemblies describes how interior and exterior wood-frame walls and wood I-joist floors can be used to meet building code

Fire tests show that CLT chars slowly at predictable rates. Photo courtesy of FPInnovations



The American Wood Council provides details for fire-resistance-rated wood-frame wall and floor/ceiling assemblies, such as the 2-hour assembly pictured here. Image courtesy of the AWC DCA3: Fire-Resistance-Rated Wood Floor and Wall Assemblies

requirements for fire-resistance-rated assemblies (see Figure 4).

IBC Section 721 provides prescriptive fire-resistance-rated wall and roof/ceiling assemblies for both traditional and engineered wood-frame assemblies.

The fire resistance of wood assemblies may also be calculated using the provisions of Section 722.6 of the IBC, which is based on the known fire resistance of many tested assemblies and assembly components. The calculation approach in this section is limited to 1 hour and is helpful in retrofit situations. The IBC also references Chapter 16 of the NDS, which has a broader application for calculating fire resistance of exposed wood members up to two hours.

By designing a building to meet the provisions of Type III Construction rather than Type V, the designer is able to take advantage of greater allowable heights and areas. For example, fire-retardant-treated wood (referenced in IBC Section 2303.2) is permitted in different locations in different types of construction, as noted in Sections 602.3 and 602.4. In Type III and Type IV Construction, this includes exterior walls and interior walls and partitions. In Type I and Type II Construction, fire-retardant-treated wood is allowed in nonbearing partitions, nonbearing exterior walls where a fire-resistive rating is not required, and portions of the roof construction. In Type I Construction, heavy timber roofs are permitted without fire-retardant treatment.

This article continues on http://go.hw.net/ThinkWood-2. Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. The IBC allows designers to increase allowable floor area and building height of wood-frame structures if what?
   a. they specify the use of preservative treated wood
   b. the height of each floor does not exceed 10 feet
   c. they add an addition of an automatic sprinkler system
   d. the connections are properly detailed

2. In a Type V building, the use of wood-frame fire walls can do what?
   a. increases fire resistance by eliminating concealed spaces
   b. allows designers to divide the structure into separate buildings
   c. eliminates the need for sprinklers
   d. Increase flame spread by 10%

3. The fire resistance in heavy timber typically comes from what?
   a. Surface char
   b. Specialty coatings
   c. Stringent harvesting methods
   d. Sanded surfaces

4. Which of the following is not included as a minimum safety precaution for fire during construction in Chapter 33 of the IBC?
   a. Fire extinguishers
   b. Standpipes
   c. Means of egress
   d. Proper scheduling of subcontractors

5. Shake table tests are showing multi-story buildings made with what type of material perform very well in earthquake situations?
   a. Ground laden trusses
   b. Cross Laminated Timber
   c. Light timber posts
   d. Additional polymer anchor points

6. What is one of the most common reasons behind the loss in roofing materials during a hurricane?
   a. Out of code lumber materials
   b. Poor shingling
   c. Moisture barrier failure
   d. Inadequate fastening

7. For floor separating dwelling units in residential buildings, the IBC requires a Sound Transmission Class (STC) rating and Impact Insulation Class (IIC) rating of what, unless the "Authority Having Jurisdiction" has its own more stringent requirement?
   a. 0,the IBC does not require STC or ICC ratings
   b. 50
   c. 100
   d. 150

8. Mass timber refers to a family of products which includes cross-laminated timber, nail-laminated timber, glue-laminated timber, and what final product?
   a. Pressed-in-place laminated timber
   b. Partial-laminated timber
   c. Dowel-laminated timber
   d. Extracted-laminated timber

9. CLT typically consists of three, five, or seven layers of what type of lumber?
   a. Multi-state
   b. Solid dimension
   c. Partially pressed
   d. Particleboard

10. True or false. CLT that meets the standards set out in the ANSI/APA PRRG 320-2018 will not delaminate during a fire.
    a. True
    b. False

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AIA Architect

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CREDIT: JOE SZURSZEWSKI

It's Time to Listen

Architects don't have all the answers on systemic inequality, but they can seek them out.

James Garrett Jr., AIA, and Nathan Johnson, AIA, are residents of the Twin Cities who cofounded the St. Paul, Minn.–based firm 4RM+ULA because they wanted to improve local neighborhoods like theirs. Since 2002, they've been doing just that, building trust in communities and embarking on projects that aim to benefit the underserved. They're also aware of architecture's limitations, especially as the George Floyd protests and the Black Lives Matter movement shine a light on inequity in the Twin Cities and beyond. "It's not just that we don't have all the answers," Johnson says, "sometimes we don't even have all the tools. And if we don't have them, how do we get them?"

As told to Steve Cimino

Johnson: We have to get over this idea that architecture alone can fix anything. We can create a lens through which the world can be observed, but it's not our job as designers to fix things. It's our job to participate in the conversation and provide a place for reflection, but in regard to architecture's capacity to fix systemic issues, I don't see how it happens.

What we can do is create a framework to start real conversations and help bring back the culture of communities that have been historically disenfranchised. We have a role to play, but it's not the role we often see ourselves in.

Garrett: There's an element of humility that is needed as well. During my eight years of architecture school, humility was not something that was taught or emphasized. But it's something I learned the hard way, working in specific communities that have been traumatized, that have been underserved, and that have had a lack of resources over long periods of time.

Architects need to accept that we don't necessarily have all the answers, but what we can do is formulate the right questions, invite the right people to the table, and create the right conditions to have the conversations from which we can obtain the right answers.

Community members are experts in what makes them happy, in what frustrates them, in what they wish for future generations. That is real, actionable information that we can take back to the lab and use to formulate architectural operations.

Johnson: Going forward, we need to make a distinction between community projects and projects in communities that have experienced trauma. A lot of our projects are among the latter; we are very intentional about the work we do, and many of our projects are those that fill unique needs within communities of color.

Yes, we have the capacity to produce great buildings and great spaces, but do they have to grow out of what we learn in school, or can they come from the community? As we spend more time listening to the communities around us, it should change the way we practice. AIA

AIANow

Safety First

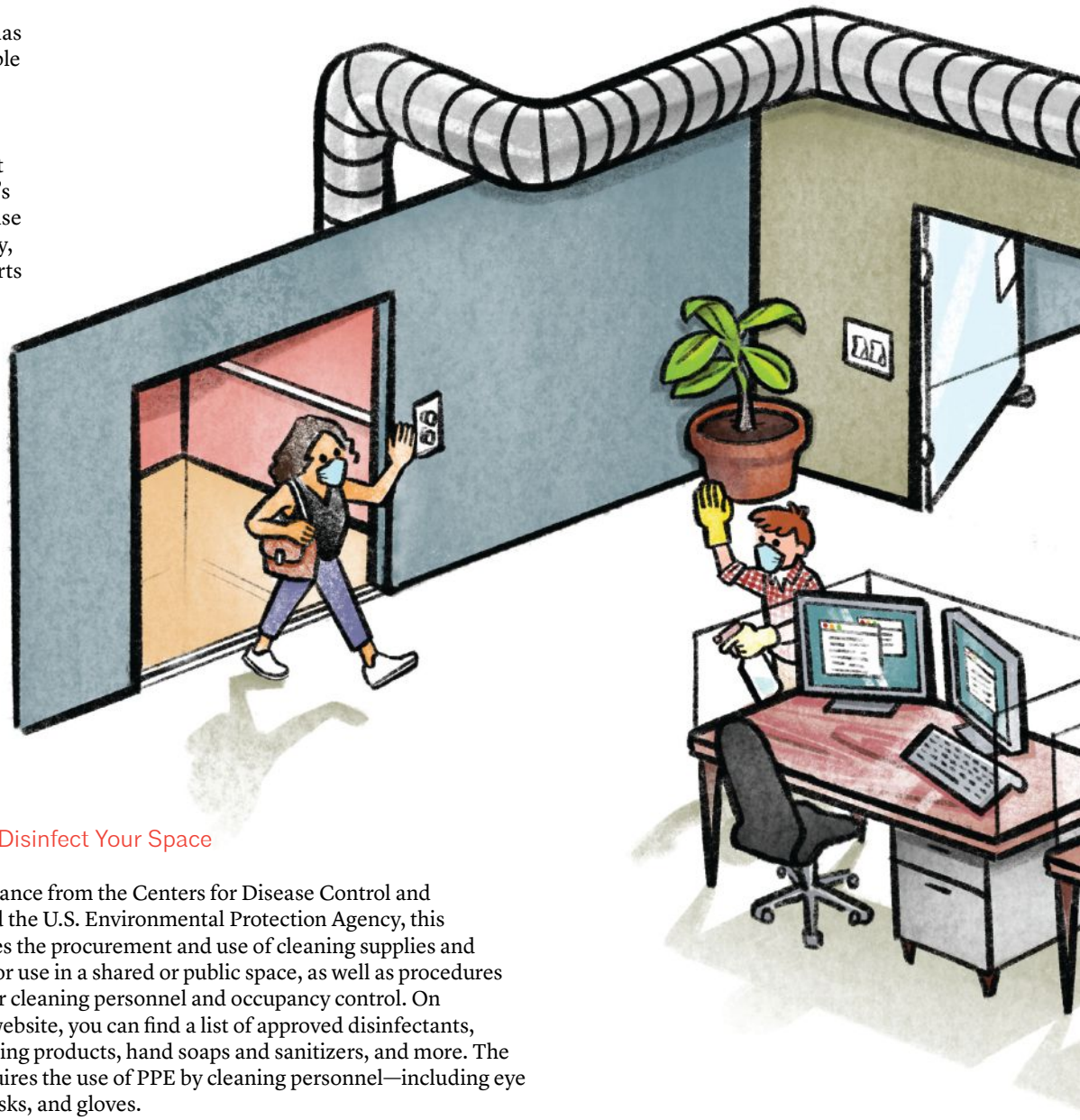
New LEED credits outline ways to keep building occupants safe from viral spread.

By Amanda Koellner

With much of the country planning to reopen after shutdowns due to the COVID-19 pandemic, the U.S. Green Building Council has released a new set of guidelines for sustainable best practices to take precautions against the virus's spread, as part of a larger strategy moving forward. They come in the form of four new LEED credits—the Safety First Pilot Credits—which now accompany the USGBC's Healthy Economy strategy, created in response to the pandemic. The credits, released in May, outline how LEED will support recovery efforts as businesses and communities prepare for post-pandemic life. The USGBC says it will refine the Safety Credit recommendations as needed and, in the meantime, is also welcoming feedback.

1. Re-Enter Your Workspace

This credit helps create a management and operations plan for reoccupancy that includes, at a minimum, two of the following categories: building or place preparation; workforce preparation; access control; social distancing; green cleaning; touch point reduction; and communication. The USGBC offers sample questions for management and occupants to answer and submit as part of obtaining the credit (e.g., "Did you feel safe today?" "Did others follow the rules today?").

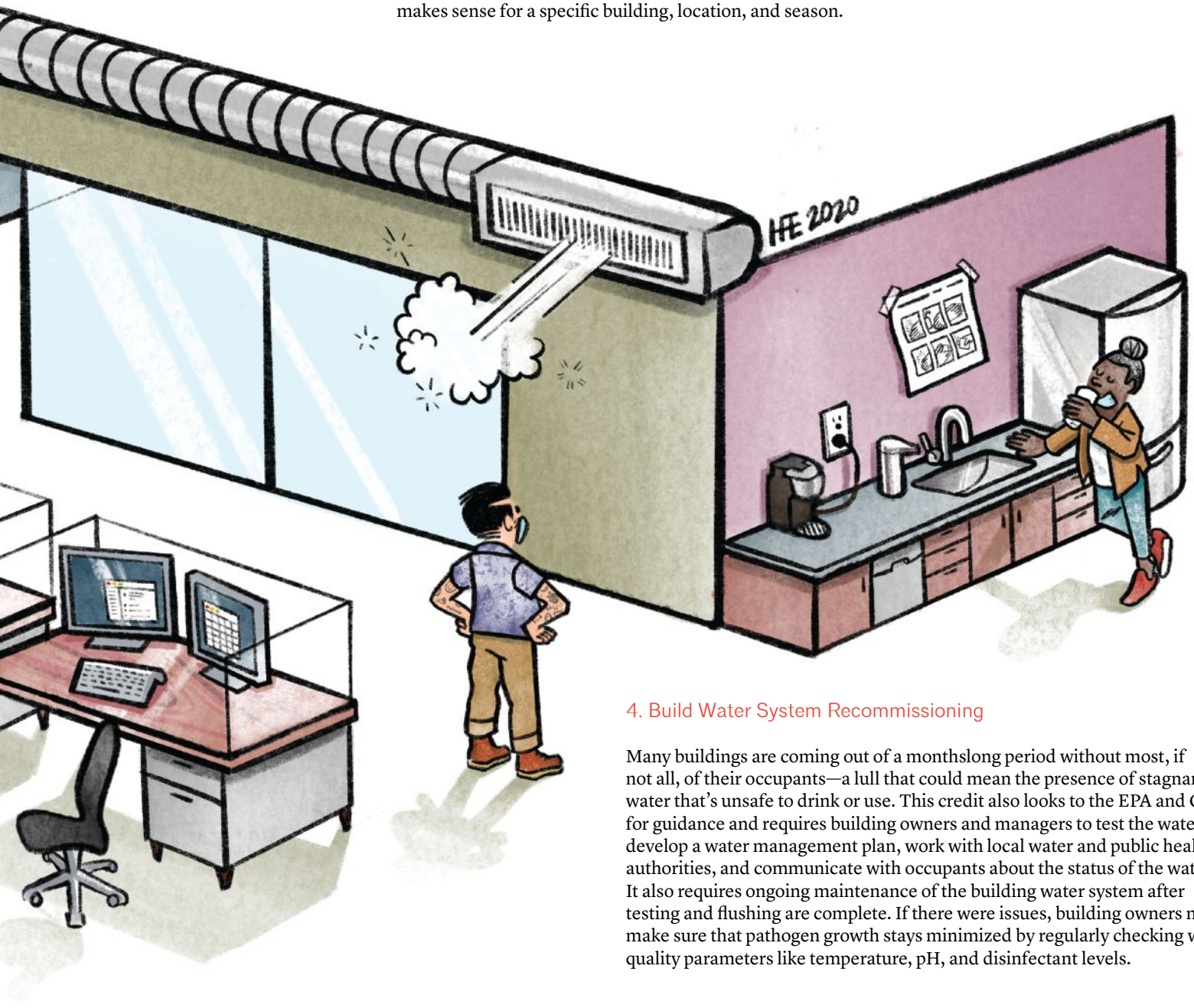


2. Clean and Disinfect Your Space

Following guidance from the Centers for Disease Control and Prevention and the U.S. Environmental Protection Agency, this credit addresses the procurement and use of cleaning supplies and disinfectants for use in a shared or public space, as well as procedures and training for cleaning personnel and occupancy control. On the USGBC's website, you can find a list of approved disinfectants, chemical cleaning products, hand soaps and sanitizers, and more. The credit also requires the use of PPE by cleaning personnel—including eye protection, masks, and gloves.

3. Manage Indoor Air Quality During COVID-19

To minimize airborne spread of the virus, this credit builds on the indoor air quality prerequisites and credits in LEED and largely takes cues from the CDC's recommendations, including increasing the percentage of outdoor air, increasing the total air flow, and using natural ventilation. The USGBC notes that, of course, all of the provided information is precautionary and cannot guarantee the prevention of illness, while also noting that because buildings vary so greatly, best judgment must be used to make sure a recommendation makes sense for a specific building, location, and season.



CREDIT: HENRY FORDING EDDINS

4. Build Water System Recommissioning

Many buildings are coming out of a monthslong period without most, if not all, of their occupants—a lull that could mean the presence of stagnant water that's unsafe to drink or use. This credit also looks to the EPA and CDC for guidance and requires building owners and managers to test the water, develop a water management plan, work with local water and public health authorities, and communicate with occupants about the status of the water. It also requires ongoing maintenance of the building water system after testing and flushing are complete. If there were issues, building owners must make sure that pathogen growth stays minimized by regularly checking water quality parameters like temperature, pH, and disinfectant levels.

AIAFeature

CREDIT: 4RM+ULA

4RM+ULA, a St. Paul–based architecture firm, felt the squeeze of a small fee and budget for the Great River Landing supportive housing project in Minneapolis.

The Housing Problem

How housing became a privilege rather than a right, and how architects today are working to change that.

By Katherine Flynn

The legacy of inequality in public and affordable housing in the United States is far from invisible if you know where to look. Today, the National Low Income Housing Coalition estimates that for every 100 extremely low-income households in the United States, there are just 37 available rental homes on the market—and Native American, Black, and Hispanic renters are more likely than white renters to have the type of extremely low incomes that make housing costs a severe burden.

Affordable housing in America has its roots in the "municipal housing" movement championed by New York social workers and others as early as the 1920s. These advocates had the goal of providing safe and sanitary homes for people flocking to America's major cities in search of industrial jobs, but the stock market crash of 1929 and subsequent Great Depression stymied the emerging movement.

Starting in June 1933, the New Deal prioritized federally funded housing to those in need through the Public Works Administration. However, the first public housing community built under the Roosevelt administration, Techwood Homes in Atlanta, permitted only white residents. In 1937, Congress established the United States Housing Authority as a permanent entity, which eventually evolved into the Department of Housing and Urban Development in 1965.

While the New Deal upheld the idea that all citizens have a right to safe and stable housing and that the federal government had an obligation to provide shelter to Americans facing economic hardship, Richard Rothstein, in his book *The Color of Law* (Liveright, May 2017), equates the housing programs that started under the New Deal as a "state-sponsored system of segregation."

To compound the issue, urban renewal policies implemented in American cities following both world wars were seen as successful in eliminating blight, but they did not prioritize the construction of new housing to replace what had been intentionally destroyed—leaving many African-American residents displaced. Policies of redlining, or the use of color-coded maps by the Home Owners' Loan Corp. (and later the Federal Housing Administration and Veterans Administration) to indicate where it was safe to insure mortgages, further limited the ability of African Americans and other racial minorities to become homeowners—one of the surest paths to the middle class in America.

In August 1967, Democratic congressman Wright Patman wrote to President Lyndon B. Johnson that "bad housing is one of the major causes of the social unrest and discontent," referring to the upheaval following the deaths of Martin Luther King Jr. and John F. Kennedy. "This is a time when we should be accelerating our housing programs to serve lower income families," he said.

While the 1968 Fair Housing Act prohibited discrimination concerning the sale, rental, and financing of housing based on religion, national origin, or sex, in practice, housing remained segregated in many areas

AIA Feature

CONTINUED

of the United States in the years that followed. Section 235 of the act shifted aid away from local housing authorities for building public housing and funneled it into providing direct supply-side subsidies to the private sector. Findings indicate that the housing subsidy program allowed a vast majority of participating white families to purchase new housing in suburban areas, while most participating African American families bought existing homes in racially transitional neighborhoods in the inner city.

At the time, policy makers saw private companies as the country's best bet for solving the "urban crisis." "The corporate boom of the 1960s inspired hope that business would serve as an engine of social change," research fellow Alexander von Hoffman wrote in a 2012 paper for Harvard's Joint Center for Housing Studies.

A decade later, the housing voucher system—established in 1974 during the Nixon administration—reflected a major shift toward more market-based housing subsidies, taking more of the responsibility for fair housing for American citizens out of the hands of government. The Nixon administration also saw vouchers as a way to break up concentrations of poverty and foster racial and economic integration.

Direct rental assistance gained even more traction under President Ronald Reagan. Members of the Reagan administration, unlike Nixon officials—who had been sympathetic to the idea of building some low-income housing—were serious about shutting down direct government-subsidized production programs.

"The Reagan administration's positions—which included support for drastic cuts in social programs—only deepened many housing advocates' long-standing suspicion of voucher programs," von Hoffman writes.

From 1950 to 1980, the total Black population in America's urban centers increased from 6.1 million to 15.3 million. During this same 30-year span, white Americans steadily moved out of the cities into the suburbs, taking employment opportunities into communities where Black Americans were not welcome to live.

Present-Day Challenges

With a 30% gap between the homeownership rates of white and Black households and a 10-to-one disparity between the net worth of white families and Black families, housing in the United States remains far from equitable today. Currently, federal funding for public nonprofit housing development is weak, despite high demand that will most likely only be exacerbated by the COVID-19 crisis.

"Social and financial security are intrinsically linked, and empathetic architecture is the scaffold for building a healthy, equitable and just society," says William Bates, FAIA, 2019 AIA President. "Providing stable housing is one of the most basic ways we can begin to address systemic racial inequalities," Bates says.

Under present-day federal housing policies, nonprofit developers can receive financing through low-income housing tax credits (in addition to mortgage loans) for new construction and remodels. However, subsidies can be hard to come by, and without them, it is virtually impossible for developers to build homes that are affordable to low- or extremely low-income families. Lenders generally lend money for housing development based on a property's expected income, and when rents are set to affordable levels, there is currently a gap between the amount of money needed to build and the amount that lenders and investors provide. It's not uncommon for developers to rely on upward of 20 financing sources as they try to fill that gap.

Architects working within the constraints of the system as it currently stands are doing the best they can to innovate and to work with nonprofit developers to help provide equitable housing opportunities.

Michael Maltzan, AIA, has designed four housing developments for the Skid Row Housing Trust in Los Angeles, including the Star Apartments. The model for the Star Apartments was hailed as innovative for its on-site medical clinic, 15,000-square-foot Health and Wellness Center, and the on-site headquarters of the L.A. County Department of Health and Human Services' Housing for Health Division—as well as its 102 apartments for formerly homeless individuals. Constructed out of prefabricated modules that were lifted into place over an existing podium, the Star Apartments became the first housing project to employ this construction method in Los Angeles.

Maltzan says that part of the intention of the project was to build long-term community instead of fostering transience: "If we are going to continue to create and evolve our cities to be more just, more equitable, more accessible, economically viable, and more sustainable, culturally and socially—housing has to be a big part of it," he says. "These projects, for me, have continued to be a way to create new forms of living in the city. I'm most interested in looking at all of the buildings together, now, as an ongoing project."

> "We end up having a mismatch between the architect and the community they're trying to serve."

The Skid Row Housing Trust was founded in 1989 and is well-resourced, but not every organization has the institutional knowledge to navigate the often-tricky affordable housing financing process. James Garrett Jr., AIA, a Twin Cities–based architect and principal of 4RM+ULA, has firsthand knowledge of the looming challenges that architects who work on these types of projects face—and why it is vitally necessary to pursue them.

"I think it's important for architects that look like me to work in communities and on projects that serve people who look like me. That is something that architecture typically falls short on," Garrett, who is African American, says. "We have a tendency to serve entire populations of people, and culturally, historically, we don't understand the reality of their lives. It doesn't lead to good engagement work, quite frankly. We end up having a mismatch between the architect and the community they're trying to serve."

4RM+ULA's Great River Landing project, located in St. Paul, Minn.'s North Loop neighborhood and completed in the summer of 2019, provides single-room occupancy and efficiency apartments for up to 72 adults who have been homeless or unemployed due to incarceration. Garrett says that budget was an issue, as it is for many projects of this kind: "We usually have small fees on projects dealing with folks who need a lot of support," he says. "So, we need to fight for that. These projects need higher fees than standard market-rate housing."

One of the biggest challenges in the Great River Landing project was securing funding for a rooftop solar array, which powers the building and allows it to operate off the grid. "We were able to add amenities and things that add tremendous value to the project because of our careful stewardship over the budget," he says. "There's a rooftop solar array on a building that some people just sort of deride as a 'homeless shelter.' But that's not how we approach it." AIA

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Politics for a Pivotal Year

As the November election approaches, a lot is at stake for architects and their clients.

By William Richards

Nationwide protests to end racism, police brutality, and calcified structural inequities; fraught economic forecasts; atrophied state budgets for public education and infrastructure; an ongoing pandemic; a polarized electorate in a polarized election; polar ice sheets losing mass; and CO_2 at the highest levels in 650,000 years.

You don't need 20/20 vision to see why 2020 is a pivotal year, to say the least, but will November be a pivotal election? It's often said that "this election will be the most important in our lifetimes." With all of these challenges looming, perhaps 2020 will be the year that rings true.

What does that mean for architects? Without endorsing a candidate or picking a side, how do we ensure that our profession's priorities and concerns are addressed by the candidate that wins in November? It starts with setting a clear vision on what those priorities are.

"Mindy Fullilove talks about a just and moral world, and if you can imagine climate action, healthy communities, and equitable communities in a Venn diagram, at the center is the architect's role," says 2020 AIA President Jane Frederick, FAIA. "If we don't fix climate health and structural racism, we will fail."

This month, AIA's Government Advocacy Committee published the Policy Platform ahead of this month's Democratic National Committee and Republican National Committee conventions to create clear guidance for the next administration in three areas. First, the economy: to prioritize job creation and equitable access to work opportunities, leverage private investment, and adopt business-friendly tax policies. Second, climate: to rejoin the Paris Accord, transform how we use energy (and the sources we develop), address the disproportionate impact of climate change on communities of color, and to commit to zero-carbon building practices. Third, healthy communities: to invest in housing and infrastructure, confront ongoing discrimination, reinvest in public places and preservation, and strengthen resilience in the aftermath of increasingly more severe weather events.

"The platform we've defined helps us align with current conversations that are happening on both sides of the political aisle, as our society grapples with these issues: safety, poverty, systemic racism, injustice, and climate change," says Timothy Hawk, FAIA, chair of the Government Advocacy Committee (GAC). "We have a responsibility to explain the gray areas to leaders, and this is broader than an election cycle pinned to November."

AIA's broader responsibilities to speak out against deleterious racism (both overt and covert) and reproach inequities that keep a 21st century profession squarely in the 19th century are urgently felt from first-year studio students to AIA Fellows. Racism's reckoning is based in realities that are as pervasive as they are deeply rooted, affecting the outlooks and opportunities of tens of millions of Americans. This extends to the 30% gap between the homeownership rates of white and Black households, to the 10-to-one disparity between the net worths of white families and Black families, and to the broken promise of economic mobility and opportunity in the United States.

As GAC chair Hawk points out, these realities demand new and uncompromising ethics of decency and equity when you put them all together. Alone, these realities need to be addressed in specific ways by architects working within their communities and with their elected leaders.

Emily Roush-Elliott, AIA, also serves on the GAC, and advocated for strong affordable housing policies within the Policy Platform. Affordable housing is something her eight-person firm, Housing and Community Development based in Greenwood, Miss., knows a lot about.

"The reason my firm exists is because of racial inequities. Every family whose home we're working on right now has to double-up or triple-up to save money because of the economic crisis," she reports. "In some cases, the structures they occupy are physically unsafe, and in other cases, they are spectacularly inefficient and their utility bills are $400 a month. So, I am an architect, but my job here in the Mississippi Delta is also about helping people be safer in ways that are very personal and specific."

Political Will and the Public Good

Buildings are responsible for 40% of the world's total CO_2 emissions, and deferred maintenance or bioremediation has made many of them dangerous and toxic. Buildings that define the most disenfranchised neighborhoods rob people of their health and leave them vulnerable to the unpredictability of a changing environment—from weather events, to infestations, to mold. Yet, architects work at the leading edge of a $1 trillion construction industry that determines many aspects of our lives. Architects are therefore in an ideal position to advocate for changes.

Investing in the public good is a question of design as much as it is a question of political will, Frederick says.

"The 'public good' is about what is sometimes called the 'third place,'" she says. "Not home, school, or work, but the in-between

AIAFuture

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places where we walk our dogs, sit and have coffee, or ride the bus. The streetscape, the park, the restaurant. Those places are meaningful and should be cultivated, protected, and made sustainable through zoning, community initiatives, and basic civility."

To see this vision become a reality, architects must be recognized as a powerful political force. That means voting in November for whomever you choose. Since 2019, AIA has maintained a series of presidential profiles on all those running—an even-keeled chronicle of an otherwise wildly uneven field, which has been whittled down to two. In the profiles, AIA maps their respective positions to issues relevant to the AIA's "Where We Stand" statements and its Directory of Public Policies and Position Statements. The AIA has policy priorities in climate action, housing, student debt, school safety, tax on business, and resilience. So do the candidates, though they disagree with each other on many of the details.

It also means direct advocacy. Most architecture firms meet the federal government's definition of small business, and for the firm leaders who run them, time is their most precious asset. In response, AIA has created the Architect Action Center on its core issues, with prepopulated email templates that allow you to contact your federal and state legislators. There's one for the student loan crisis, one for affordable housing, one for sustainability and resilience, and one for the INVEST in America Act to create jobs for architects, spur projects for firms to secure, and improve communities through infrastructure and transit investment, among other measures.

November is also significant as it marks the final month of Frederick's tenure as AIA President. In December, Chicago architect Peter Exley, FAIA, takes over to advance the Policy Platform.

"The most successful architecture projects embrace the public good," says Exley, "but we must be much stronger and insistent in advocating for the public good and articulating the evidence of its power to improve lives. That means evidence-based design and codes, of course, but it also means talking about the value we bring to our clients, to job sites, to developers, and especially to end users and elected officials."

In doing so, both Frederick and Exley see both the current public health crisis and the crisis of conscience that racial justice demands as catalysts for architects to demonstrate the ethical core that distinguishes their work as individuals and collectively as a profession. AIA

AIAPerspective

CREDIT: J CARRIER

Healthy, Safe, and Equitable

Accountability ensures that our deeds will match our words.

This month, AIA is hosting a major one-day virtual learning event, "Architecture in Turbulent Times." It's designed to help architects face the challenges posed by the simultaneous crises of climate change, COVID-19, and systemic racial injustice.

It's one more way we're adapting to this unprecedented and challenging year. If you'd told me in 2019 that we'd shift practically overnight to holding online meetings and conferences as a matter of routine, I'd have been proud of our leadership in adopting greener practices. Indeed—although we never would have chosen these circumstances—the capacity we've collectively demonstrated to quickly implement positive change is a source of encouragement in challenging times. This ability to transition to greener alternatives on a large scale is exactly the kind of progress we need in order to build a more sustainable world.

Yet I never could have imagined just what "taking stands" would mean for our profession in 2020. Our mission to protect public health, safety, and welfare has never been more relevant. And I've never seen greater motivation in our profession to fully live our values.

Our urgent, methodical work to lend a hand in the COVID-19 pandemic—first in adapting buildings into health facilities, then in providing guidance to safely reopen public spaces—has remained critical throughout a summer marked by progress in some areas and dangerous surges in others. And our expertise and commitment to creating spaces that are healthy, safe, and equitable will remain just as vital as we head into an uncertain autumn.

"Healthy, safe, and equitable." These are principles our profession has long been committed to, but they've taken on added weight as communities across the nation have taken a stand in new ways for racial justice.

We are taking a stand in new ways, too.

AIA is committed to the fight to permanently dismantle this country's centuries-old system of racial injustice and violence. We expect to be and welcome being held accountable in the coming months and years to ensure that our deeds match our words.

Following the decision by the Board of Directors to prioritize racial justice as an organization-wide focus in the same way climate leadership is a fundamental mission, it's been a summer of listening and action.

Colleagues within our membership, as well as CACE, NOMA, and other essential voices, are generously sharing their insights, creating an ongoing dialogue to inform steps for translating our ideals into meaningful progress.

As we continue to build a list of short- and long-term actions, we are implementing some immediate steps to focus on AIA itself—as an employer and a professional membership association.

To that end, AIA will participate in the NAACP 2020 Diversity & Opportunity Report Card for the Sustainable Building Sector. Slated for release in 2021, the audit will evaluate equitable practices within AIA, including staffing (composition and perceptions), programs and services, procurement, and governance. Part of the NAACP's Centering Equity in the Sustainable Building Sector (CESBS) Initiative, the program will examine the building sector along four categories: design firms, contractors, nonprofits/professional organizations, and higher education institutions. The NAACP Report Card will set a transparent, comprehensive marker to measure against.

Additionally, we are developing a series of guided discussions organized around chapters and developed through the Guides for Equitable Practice. Formulated over the last two years in partnership with Renée Cheng, FAIA, dean of the University of Washington's College of Built Environments, and her teams at the University of Minnesota and University of Washington, the guides include case studies and tactical advice to, as Cheng says, "convert intentions into actions." They are a valuable tool as we dismantle our implicit and explicit biases.

Central to that effort is ensuring greater diversity when it comes to who we recognize for professional achievements, and to whose voices we feature in our editorial content in print and online. Who we honor today inspires tomorrow's pioneers and innovators, and who we feature motivates the next generation of leaders. AIA

Jane Frederick, FAIA, 2020 AIA President

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What Does Real ACTION Look Like?

Representation matters. Diversity, equity, and inclusion matter. And to achieve these goals for the building industry, real action and real change must happen. Dismantling the systemic racism that pervades our society—and with it, architecture and the built environment—will take time and a sustained commitment. And we must approach the difficult and necessary work ahead with humility, urgency, and collective action. In her AIA Perspective column (page 68), AIA President Jane Frederick, FAIA, outlines the Institute's commitment to fighting racial injustice, as well as some next steps. And in the following pages, emerging and established professionals, DEI experts, educators, and industry leaders share their visions and ideas for achieving a more inclusive profession—not only to increase representation for Black architects and other architects of color, but also to create an industry that celebrates them. A more equitable world depends on it.

In response to the recent, sustained calls to improve diversity, equity, and inclusion in the AEC sector, ARCHITECT asked 12 thought leaders from across the country to weigh in on what meaningful, actionable change can look like for the profession.


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SAMANTHA JOSAPHAT

principal, Studio 397 Architecture; president, nycoba|NOMA
New York City

1 When I start seeing positive results from actions, not statements, I'll start to believe change is happening. Our industry thrives on lofty words. If it can figure out how to translate lines into buildings, it is capable of figuring out how to translate equal rights for all humans into actions. If change is what we want, we can figure it out—we just have to practice at it. Leading by example is key.

TERI CANADA, AIA

co-founder and managing principal, Evoke Studio Architecture
Durham, N.C.

2 Architecture firms need to train and promote African Americans, other people of color, and women to leadership positions. We should not only be designated as diversity leaders but also as principals and directors of design, architecture, and management. I am not suggesting to promote individuals without the correct qualifications, but to actively help them achieve the necessary training for these positions.

Architecture firms also need to "feed the pipeline" and develop initiatives that expose young children to the architecture and design fields. By the time many children in underserved areas find out about architecture, it is too late to develop the portfolio required to enter an accredited architectural school. By feeding the pipeline, we are able to get more African Americans and other POCs into architectural programs and give firms a more diverse talent pool.

KATHY DIXON, FAIA

principal, K. Dixon Architecture
Washington, D.C.

3 We need to put on different lenses to see the change that is happening, as well as the change that is not happening as quickly as we would like. Over my nearly 30 years of experience, I've watched change occur at a slow but steady pace; diversity within senior management at large national firms has gone from nonexistent to somewhat more regular, accepted, and desirable. Decades ago, African American architects had few options but to strike out on their own when no firms would hire them. Now they are being hired by the major firms, and a few are even promoted to executive levels. This is encouraging, although many regional and mid-sized firms still lack any diversity in senior management or among their design studio staff.

WHAT WILL CONVINCE YOU THAT THIS CALL FOR CHANGE IS DIFFERENT?

DAWIT N.M.

MELISSA R. DANIEL, Assoc. AIA

architectural designer, AMAR Group LLC; design advocate
Washington, D.C.

4 Systemic racism cannot be solved by forming a committee, workshop, or webinar. This process takes years, likely decades, as well as commitment and humility. The BIPOC community seeks serious change; the current calls to action are buzzwords that were wordsmithed together without including tangible change. To convince me that the AEC profession is serious about improving diversity, equity, and inclusion, there must first be identification of and work toward eliminating microaggressions resting in firm culture. Firm leaders must foster challenging, uncomfortable conversations among themselves and their firms to address these microaggressions head-on. Identifying these expressions will be difficult because firm culture often perceives them as "joking around" or labels those who speak up as "sensitive people." I am no expert in DEI methods and practices; however, the AEC profession is screaming out for resolution.

RAINY HAMILTON, FAIA

founder and principal, HamiltonAnderson
Detroit

5 I have been in the profession for 41 years. I will need to see and experience majority individuals and companies extending an open hand and invitation to African American architects to become part of the larger network of business opportunities. Opportunities to design projects in leadership roles must be made available to African American architects for them to advance and build wealth. We must go far beyond the tokenism of offering a small percentage of a project to architects of color while majority firms control the project direction and compensation.

MAYA BIRD-MURPHY, Assoc. AIA

founder and executive director, Chicago Mobile Makers
Chicago

6 Improving diversity, equity, and inclusion has finally become "mainstream." I've seen statements of solidarity from many AEC companies, but these statements must be backed up by action steps. I won't be convinced that real change is happening until firms have DEI action steps written into their business plans and have employee-led committees that have the power to keep firm leadership accountable. AIA and other national organizations should be putting pressure on firms to create such action steps.

ALVIN HUANG, AIA

principal, Synthesis Design; associate professor and director of graduate and post-professional architecture, University of Southern California School of Architecture
Los Angeles

7 A parallel exists between how we think about diversity, equity, and inclusion in the profession and the way we view the role of sustainability in the built environment.

The best sustainable designs are integrative rather than additive: They consider the building as an ecosystem of design decisions and opportunities that perform synthetically. Sustainable design decisions shouldn't just improve a building's environmental performance; they should improve the overall design.

Similarly, DEI cannot be thought of as additive—like sprinkles or icing on top of a cupcake. Rather, they need to be thought of as both transformative and integrative. How can we alter the DNA of our profession to benefit everyone rather than just sprinkling a little bit of diversity on top? These ideals cannot be compartmentalized into issues of human resources purely for the sake of representation. We need to do the homework to recognize the failures of the current systems of power in this country—and in our profession—so we can address them systematically.

SUMMER SUTTON

Ph.D. candidate and co-founder of Indigenous Scholars of Architecture, Planning and Design, Yale University School of Architecture
New Haven, Conn.

8 Firms and institutions can make a statement of commitment and responsibility to enact change, but individual members of the organization's leadership should also personally deliver a statement to increase the sense of accountability.

Publicly highlighting employees with experience and knowledge of working with Indigenous clients or partnering with Indigenous-led firms and institutions are examples of how to value diverse perspectives. This can also reveal gaps in representation within a firm. Doing so in a public manner holds the company *and* the employee responsible for continuing to foster those knowledges through their career development.

Giving your time to develop and foster meaningful relationships with communities that have been historically underrepresented in the AEC professions will have long-term benefits. Community development requires a commitment to engage in a mutually beneficial way with partners who can vouch for your commitment to respectful collaborations.

Statements should be made to highlight the steps that have been taken. Doing—and not just saying—these things is when we will know there is real change.

PREVIOUS PAGE: 1: JARROD ANDERSON; 2, 10: EVOKE STUDIO ARCHITECTURE; 3: K. DIXON ARCHITECTURE; 4: MAXMILIAN FRANZ; 5: ERNEST SISSON; 6: RYAN PAGELOW; 7: COURTESY USC SCHOOL OF ARCHITECTURE; 8: MICHAEL A. HERNANDEZ; 9: STEVIE ROTELLA; 11: COURTESY QUILIAN RIANO; 12: VOLCY PHOTOGRAPHY

RICO QUIRINDONGO, AIA

principal, DLR Group
Seattle

9 Meaningful change can only begin by looking inward, taking stock of our current position, and accepting and owning the data uncovered in that exploration. Some firms have begun using the Intercultural Development Inventory to assess their practices' cultural competency, to identify where they fall on the continuum from denial to adaptation, and to begin to create diversity, equity, and inclusion frameworks that support strategies for reform, investment, and growth. All firms need to do this work. The Memorandum of Understanding between AIA and NOMA needs to be adopted and understood by all of our member firms. They should also be required to invest in education that introduces architecture to students at the K–12 and college levels and to support a BIPOC community of young leaders to move and grow into leadership positions across the AEC professions.

EDWIN HARRIS, AIA

co-founder and design principal, Evoke Studio Architecture
Durham, N.C.

10 Because of our own experiences as African American architects, we have been intentional as firm owners to raise awareness of the profession to those who may not otherwise be aware. We consistently visit elementary, middle, and high schools for career days and talks. We host events for students at our office. We also teach on the collegiate level. Our mission is not only to be present, but also to engage students to become excited about the profession, which I hope will shift the landscape of our profession.

QUILIAN RIANO

founder and principal, DSGN AGNC; associate director, Kent State University College of Architecture and Environmental Design's Cleveland Urban Design Collaborative (views are my own)
Shaker Heights, Ohio

11 Seeing and participating in the collective organizing and production of work in social/racial justice groups led by BIPOC designers like Design as Protest has brought me hope. It demonstrates what is possible when designers work together in a democratic model to discuss, debate, and propose complex demands, ideas, and direct actions to confront complex and entrenched problems. I urge leaders in practice and academia to listen and adopt the demands coming out of these groups and collective processes.

Outside of design, I've been interested in emerging explicitly anti-racist economic models that emphasize community wealth-building, collective ownership, and democratic decision-making. For example, Cleveland Owns is a radical incubator that equips groups to build wealth and power through collective ownership. The Democracy Collaborative is another leading group forming employee-owned cooperatives and pushing what it terms the Democratic Economy with a stated goal of confronting racial inequity.

I am interested to see how these collective efforts may provide openings for architectural practice to fundamentally change financial and organizational models—and potentially change the kinds of projects and communities it works for.

ALICIA VOLCY, Assoc. AIA

owner and founder, Studio Volcy Design + Development
Pittsburgh

12 I'd like to see the design community mentor professionals the way the sports industry mentors professional and collegiate athletes. Many of the world's greatest athletes are trained by professionals from different racial and ethnic backgrounds: They nurture the athletes to ensure that they reach their peak performance. Race doesn't seem to matter.

In the architecture community, leaders typically mentor those who look like them. When less than 2% of the entire profession looks like you, where exactly does that leave you? Of course, having the urge to mentor someone who reminds you of yourself isn't intentionally racist. But that's the point that we keep missing: You don't need to have racist intentions to end up with a racist outcome. And here we are.

I do worry that encouraging black youth to pursue architecture is setting them up to enter a profession that will only mistreat them and oppress them further. But, this topic would probably require a four-part docuseries.

> *To read more responses from these thought leaders, visit bit.ly/AR2020DEI*

What Are First Steps Toward a More Inclusive Workplace?

ACHIEVING A DIVERSE, EQUITABLE, AND INCLUSIVE FIRM WILL TAKE TIME.

THE PROCESS, SAY THREE DEI EXPERTS, BEGINS WITH EXAMINING YOUR CULTURE.

LEARN THROUGH LISTENING

SHARON STEED

founder, Communilogue
Pittsburgh

Many organizations, leaders, and managers are understandably feeling overwhelmed at the moment. We all finally see how painful life can be for certain segments of the population. Several of my clients have expressed their hesitation, even fear, in confronting these topics: What if they say the wrong thing? What if they hurt someone? What if it isn't *enough*?

The issues we are facing, however, don't have to be intimidating nonstarters: They are opportunities to foster connection and drive inclusion, and architects are exceptionally equipped to tackle this challenging time in our history within the ranks of their firms. Architects not only understand their clients' physical needs and wants, but also what is possible for a site, and what needs to happen in order to get it there.

Use this same approach to create an inclusive and equitable culture at your firm. The first step is learning through listening: Leaders need to initiate one-on-one conversations with employees about their experiences in their firm. Make sure each individual understands that their opinions matter and will in no way affect their employment. Ask them: Do they feel included? Heard? Like they belong? Listen to their stories without judgment, and try to internalize their struggle.

Make the most of what you learn by implementing changes to your hiring processes to increase diversity; using inclusive language to ensure everyone in the office can join every conversation; and elevating existing voices in your ranks who may feel like they have, or have actually, been silenced.

These conversations can be challenging and daunting. Bringing in outside help at the beginning of this process is OK. Consultants can facilitate these tough discussions as well as create a safe space for these conversations to flourish and guide your firm in long-term diversity, equity, and inclusion planning.

The rawness of the world right now requires those open lines of communication. When you begin to listen as an *action*, you will confront the brutal truth that your worldview has been very narrow to date. That's OK: You are learning through listening.

QUESTION EVERYTHING

LILY ZHENG

diversity, equity, and inclusion consultant, Lily Zheng Consulting
San Francisco

Corporate culture is the implied and unspoken values, beliefs, and behaviors that represent a company's identity and inform how employees should interact with each other and clients. Culture is embedded within office policies, processes, and expectations. Where does DEI come into this? Most firm cultures are designed, intentionally or unintentionally, to be most comfortable for their leaders, who are overwhelmingly cisgender, heterosexual, college-educated white men.

Fostering a culture of inclusion that welcomes women, people of color, LGBTQ+ people, working-class people, and other underrepresented minorities requires reimagination from the ground up. Here are the steps your firm must take, and the introspective questions you must ask all employees:

1 **(RE)DETERMINE YOUR COMPANY VALUES, IDENTITY, AND ETHOS.**
"Who" is your company? Who belongs inside it? One powerful way to begin this exercise is to ask: "Who are we not?" Aim high. Should your company be a place for underrepresented minorities to work? Buy from? Why and how should it *earn* that reputation?

2 **UNPACK THE ASSUMPTIONS AT THE CORE OF YOUR COMPANY AND INDUSTRY.**
In design, for example, what stylistic approaches are accepted to be best? What is considered "normal" or "standard" within mainstream architecture education? What are the unspoken expectations for architects interacting with each other and their clients?

3 **IDENTIFY HOW THESE ASSUMPTIONS EMBED THEMSELVES IN COMMON PRACTICES.**
Do white men primarily interface with clients, even if they're less experienced than other team members? Does your firm interact with certain clients more than others or pursue certain types of work? What holidays does your firm recognize? What amount of unpaid labor is expected from employees?

4 **EXPLICITLY REWORK ASSUMPTIONS AND COMMON PRACTICES TO ALIGN WITH YOUR IDEAL COMPANY IDENTITY.**
What do design processes, expectations, and policies that support people of all races, genders, incomes, and social identities look like? How can you normalize these new aspects of culture?

SUSTAIN YOUR CULTURE TRANSFORMATION

SHIRLEY DAVIS

president and CEO, SDS Global Enterprises
Tampa Bay, Fla.

Culture transformation has become a focus for firms that recognize it can make or break their brand reputation among customers and top talent. Culture can be elusive and invisible, yet it affects the productivity, engagement, creativity, and retention of employees, many of whom are demanding that our workplaces create a sense of belonging, be free from harassment, and—at the very least—be more inclusive and equitable. It can also affect bottom-line profits.

But changing culture is not easy, nor is it a quick fix, which explains why most efforts either fail or stall. What is the secret to transforming culture in your firm in a way that results in sustained success?

From my experience, I can attest that the clients who have succeeded at culture transformation all understood two things: First, you must implement a comprehensive and robust strategy rather than taking a short-term approach; and, second, you must make it every leader's responsibility. Here are five steps to get started:

1 Start with a culture audit to identify the current state of issues, challenges, and strengths, as well as opportunities and deficiencies both inside and outside of your firm.

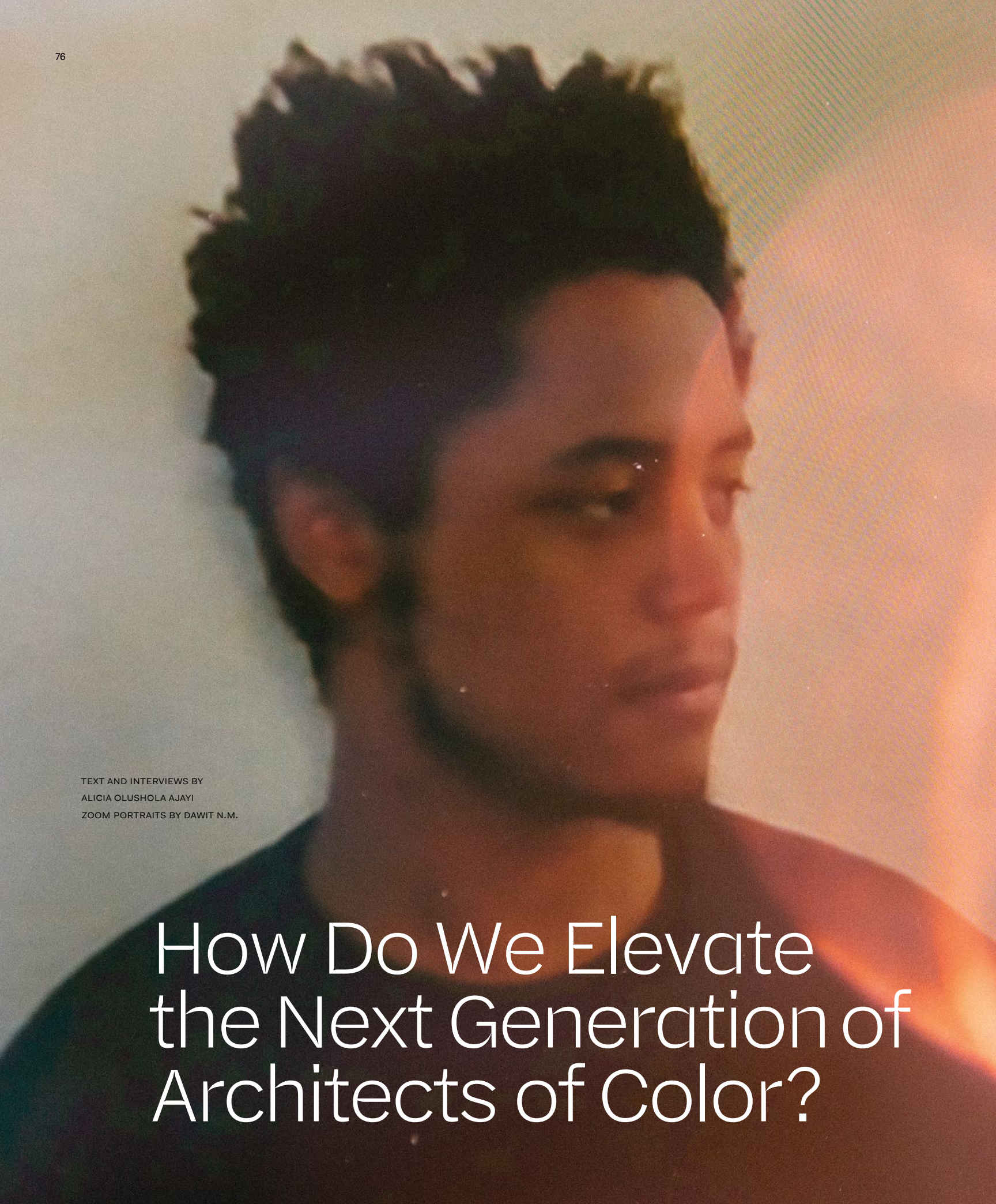
2 Integrate and align inclusive behaviors into your values, policies, and strategic plan to reflect the changing demographics in your talent pool, customer segments, and communities.

3 Replace archaic belief systems that breed power structures through homogeneity, conformity, and hierarchy.

4 Provide education and development for leaders and staff on how to work more inclusively and effectively across differences.

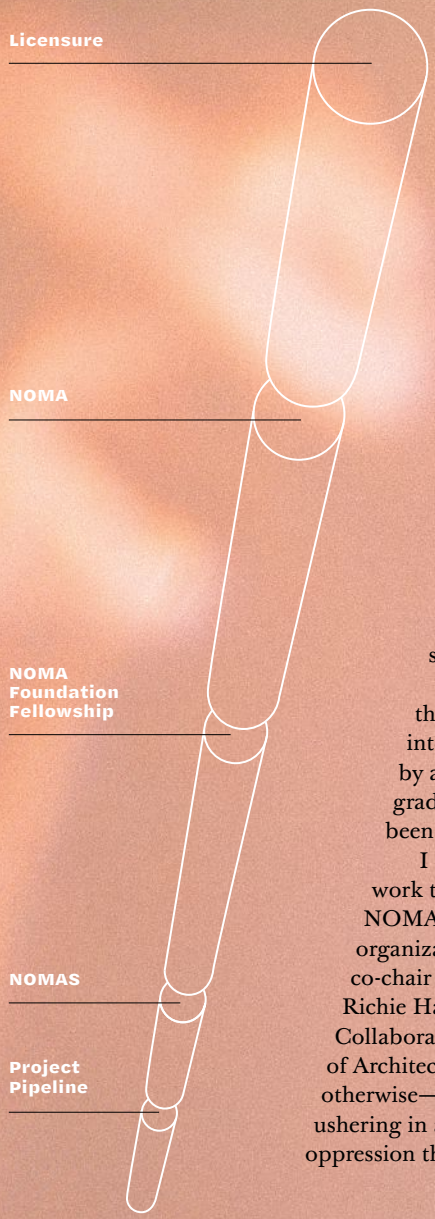
5 Institute accountability systems that reward inclusive behaviors and reinforce your firm's values.

Use these steps to begin the journey to transforming your firm's culture. The process is not a sprint, but a marathon, and yet it must be approached with a real sense of urgency in order to achieve sustained success.



TEXT AND INTERVIEWS BY
ALICIA OLUSHOLA AJAYI
ZOOM PORTRAITS BY DAWIT N.M.

How Do We Elevate the Next Generation of Architects of Color?



In these uncertain times, architecture firms and schools are facing severe, though hardly new, indictments sparked by global outcries against racial inequality. Today, the profession is being forced to reckon with allegations of upholding white supremacist cultures and practices—the dismal lack of diversity among architecture firms and student bodies being just one glaring metric. The National Organization of Minority Architects, founded in 1971, has responded by building a pipeline to increase the number of architects of color. With programs that include Project Pipeline, the National Organization of Minority Architect Students, and the NOMA Foundation Fellowship, the organization is supporting students of color at crucial milestones to becoming an architect. Project Pipeline aims to give students exposure to architecture at an early age—a significant determinant in their choosing to pursue the profession. Since its inception in 2005, the program has served more than 10,000 middle school to high school students in more than 25 cities around the country, offering summer camps, career days, and workshops that teach design justice. The project gives students new insight into the built environment in their communities, while spotlighting architecture as a viable profession.

The NFF is NOMA's most recent push to add to the pipeline life cycle. Unveiled this summer, the fellowship placed 30 NOMAS students in eight-week paid internships at prominent firms across the country. The new initiative, largely supported by a partnership with the AIA Large Firm Roundtable, aims to provide access to graduates of color, while inspiring the profession to see the untapped talent that has been too long neglected.

I spoke with five NFF fellows—all smart, passionate, energetic, and eager for their work to help the communities that need it most. I also had a Zoom call with four leading NOMA advocates who are helping to build the pipeline: Kimberly Dowdell, AIA, the organization's national president and a principal at HOK Chicago; Bryan C. Lee Jr., co-chair of Project Pipeline and founder/director of New Orleans–based Colloqate Design; Richie Hands, ASSOC. AIA, co-chair of Project Pipeline and an associate at Lamar Johnson Collaborative in Chicago; and Dr. Kwesi Daniels, head of Tuskegee University's Department of Architecture in Tuskegee, Ala. They discussed the challenges—financial, social, and otherwise—that students of color face. They also unpacked the real purpose of the pipeline: ushering in a new generation of architects who can think critically about fighting systems of oppression through design and who will create a more equitable profession.

FOUNDATION FELLOW

This fellowship is a really great thing. It's an opportunity to get into these big name firms. It's really going to open doors for incoming graduates. It's also going to start making firms think, "Hey, let's start looking at these schools." In my personal experience, some firms just recruit from certain schools—very particular name schools. I know I have won competitions against these top-name schools, but still firms look at them. So it's really creating that new pipeline from college to professionalism.

I was the only African American in my graduating class at Illinois. Seeing what firms are posting, seeing what a lot of people in our industry are posting, I feel like it's trending right now. But I do respect them, firms acknowledging themselves. We need to diversify, we need to do more, but then we have to also respond. I think with firms acknowledging the current political moment, it helps influence the younger generation: "Hey, we can do this as well."

AARON DEROUX
M.Arch. 2020, University of Illinois at Urbana-Champaign

AT

HED
Chicago

ADVOCATES

KIMBERLY DOWDELL For the first portion of my term as NOMA president I have been really focused on my platform, which is called ALL in for NOMA, standing for access, leadership, and legacy. A big portion of what we're talking about today is access, which is focusing on K–12, our college and graduate students, those who are on the pipeline to licensure. Most recently we created the NOMA Foundation Fellowship, which is designed to help graduates connect with firms to get them access to opportunities right after graduation. We're giving those fellows a stipend. And at the end of the fellowship, should the firm that they're with have the bandwidth, hopefully they would get hired and that would evolve into a full-time position.

So, you know, is it a silver bullet? No, but we have to take the resources that we have available and try to multiply them as much as we can to get as many minorities into the profession as possible. Then there's Project Pipeline, which is one of our signature programs and something we're super focused on, particularly this summer as we transition it from physical camps to virtual camps throughout the country.

BRYAN C. LEE JR. What we've tried to do with Project Pipeline is create a camp, a program, that doesn't just seek diversity as its outcome but recognizes that diversity is a byproduct of justice and equity. And so we're using a curriculum that really starts to acknowledge that we have a process that has to equal service to our communities.

If we are not in service of our communities, we will never create spaces or create the profession that can retain people. We've tried to create a camp that makes sure that we build out the community of students who are engaged from middle school to high school. And makes sure the pipeline doesn't stop there.

RICHIE HANDS The biggest thing that got me into it was that I wanted to help with the curriculum, help make everything standardized, and help make this pipeline work, both within the camp but also as a big stepping stone going forward. We took a shot at redeveloping the curriculum so that within the camp, depending on how many years you've been, you're experiencing something new. You're looking at something through a different lens. And it allows the students to return and learn something new, and build upon their skill sets from previous years.

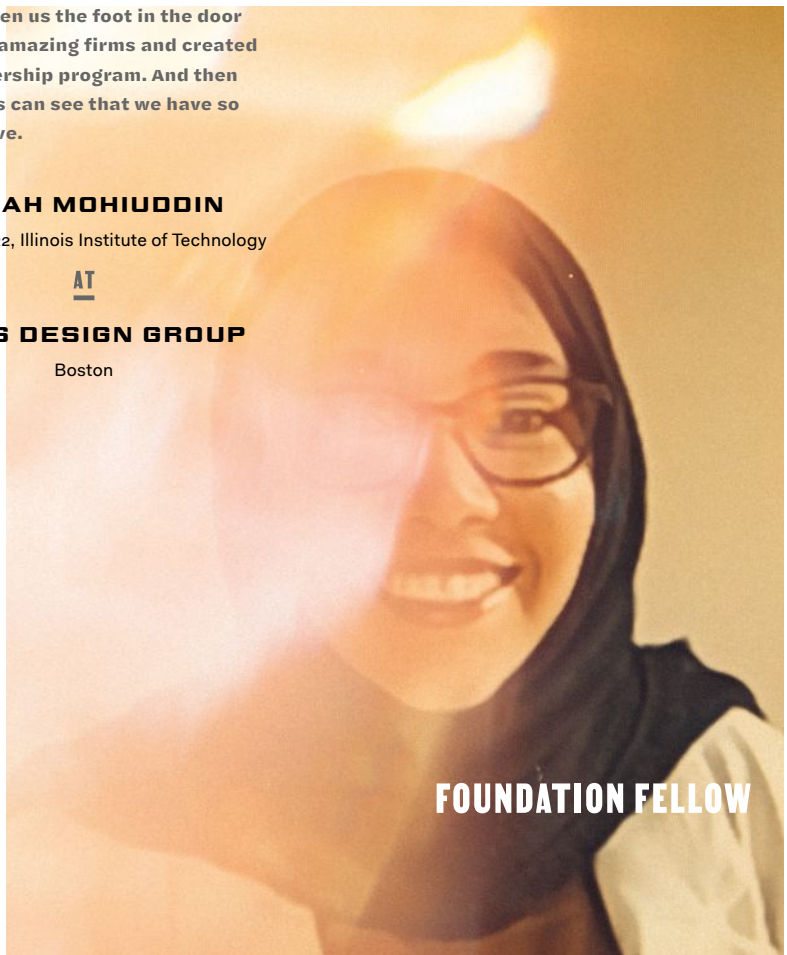
ALICIA AJAYI We hear this over and over again, that a lot of people in our communities of color, they don't see architects or maybe they don't get exposure to the profession. I'm wondering how Project Pipeline responds to that problem.

LEE Yeah, that's huge. We have spent many years developing a course that tries to create connections. So, high school students having connections with recent graduates who are college students creates a strong bond in that space. What's really great is the mentorship that cascades up or down and allows for parents to see their children move up the spectrum. What we found in our camps is that students' ability to find themselves in that space prevents them from having to try to jump forward and see

I'm working with Jha D Williams at MASS Design. She's a NOMA member. So far I have been doing a little bit of research and a little bit of design work. I'm visibly Muslim and I'm an Asian woman, and so for some people that is hard for them to understand. In high school, I looked online for different resources of how I could understand what architecture was or how I could get involved. That's when I stumbled upon the ACE Mentor Program, which connects high school students with professionals in the architecture, construction, and engineering fields. That's where I found mentors involved in NOMA, like Richie Hands. And they introduced me to the Project Pipeline summer camp. Getting involved with ACE and NOMA as a high school student, that was such a turning point. If I hadn't done that, I wouldn't be in architecture.

It's important for firms to realize that we're so much more than our identity, but also I do want them to see my identity because that's where I am. So while I think it's important to make space for people of color and Black people, you should also be hiring us because we deserve to be there versus to fill a space or fill a number. The fellowship's role in this has been super important because they've given us the foot in the door into these amazing firms and created this partnership program. And then these firms can see that we have so much to give.

NIMAH MOHIUDDIN
M.Arch. 2022, Illinois Institute of Technology
AT
MASS DESIGN GROUP
Boston



For the fellowship, they send your resumes and then they match you with the firm. When I got the email from Ennead, I was so shocked. The work that they do is fantastic. What I'm working on now is an e-Lab. Most of it starts with heavy, heavy research and community engagement. I really want to open my own design-build firm that focuses on developing affordable housing in New Orleans. The work that Ennead does, it's on a larger scale—New Orleans is very-small scale—and so what I'm learning with them is so valuable. If not for this fellowship, I don't know whether I would have had an opportunity to work in a firm like this right off the bat. So it's a real blessing.

If I look back, I personally didn't feel like there was necessarily a place for me in architecture. There was no one who looked like me. It was really through NOMA that I was able to see that there is a different type of design practice, of just being able to acknowledge what tools you need to create the space that you want to see in the world. If not for NOMA, I probably wouldn't have made it through architecture school.

KERISTEN EDWARDS

M.Arch. 2020, Tulane University

AT

ENNEAD ARCHITECTS

New York

FOUNDATION FELLOW

themselves immediately as professionals. If they only see the 40-year-old white dude who wants to give back to the community, there's no tangible connection between point A and point Z.

HANDS One of the strongest things that has happened within the Chicago camp is that we have a number of students that repeatedly come back to volunteer. Our camp focuses on middle school students, so seeing the new or younger high school students now mentoring middle school students, and the older high school students mentoring the younger high school students, and building with the college students as well since we have some strong NOMAS chapters locally, there's just an immediate pipeline of students that are within eight years of each other. They can see an immediate pathway, and if they're genuinely interested in architecture, be like, "OK, that's where Richie is right now. That's where I'm going to be in two years." I think that helps keep them energized going forward.

AJAYI The goal of the project is to get more people into the profession. But I'm also wondering about the kids who don't enter the pipeline necessarily. It still seems so valuable to be able to go to these camps to learn about another aspect of spatial awareness that they didn't known about.

DOWDELL I have had the experience, at least a handful of times, where we ask the young people to raise their hand if they're interested in architecture. And out of a room of 30 kids, it's one or two. Which hurts a little bit, but I get it. It's still a new concept, and I think the kids still enjoy learning about their cities and drawing and hearing from the mentors.

I think what's really positive is that even if they don't go into architecture, all of a sudden there are all these people who have knowledge of what architecture is, which will ultimately make them better users of the built environments, better clients. I think that early exposure helps to make the profession more widely appreciated.

KWESI DANIELS Particularly when you're talking about a program like ours at Tuskegee—unlike a lot of schools of architecture, where to come in you have to bring a portfolio—we tell students: "Come on board. We'll teach you what you need over the first two years, and if you still want it, then we'll see where you are and you'll keep learning."

Unfortunately that portfolio is also a barrier to access. We come across so many students who haven't even heard of the word portfolio, but when you go through a camp that has exposed you to architecture, you get exposed to the lexicon. If you're a student who's interested, you also are prepared to apply to schools of architecture because there are barriers to getting in, from portfolios to understanding the necessity for an accredited program. These are the kinds of conversations that will be brokered with them before they arrive, and by the time they see us, they will have had that training.

LEE Our first camp, I was extremely nervous and didn't know how it was going to go. We had this young student Mahala who had no interest in what we were doing. Zero interest. But she was drawing all of these trees in her notebook—that was what she was doing. So the second day in we said, "OK, Mahala, you're going to be the landscape architect." So she became the landscape architect for this entire cityscape. Mahala went on to go into psychology in college but came back every year as a mentor.

A few months back before the virus hit, she said, "I think I'm ready." I'm like, "OK, cool, let's do it." She wanted to come work with us. We couldn't do it at this moment, but I think people take their own path to understand how the physical environment

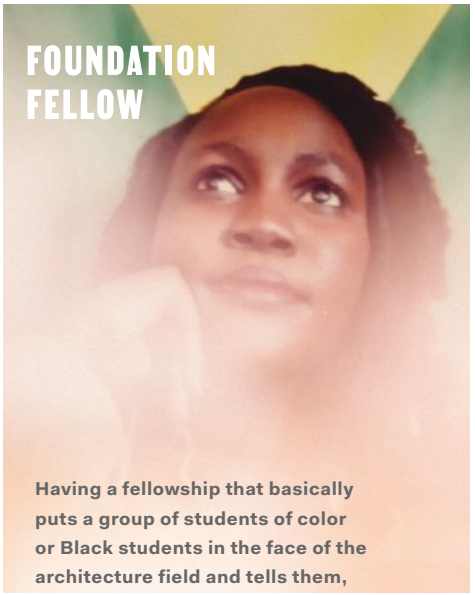
relates to the larger things that they care about in this world. And our job is to give them that opportunity to go at their pace, understand the relationships between themselves and the physical environment, and how to manifest that space.

DANIELS I find this at the collegiate level: A lot of students don't understand the transferable skills they can get from collateral spaces. And those collateral spaces can actually make you a dope architect. Because you understand, in her case, psychology. I understand how people think. That means I understand how to address this community when we speak about social justice issues, whether it's communities of color or other marginalized communities. If you have an understanding of peripheral elements, you can bring them into architecture and it's a great fit. One of the things I like most is when I see students who come in and they're shy. We're all like, "Ah, you're not going to be shy too much longer."

Their parents are like, "They're reserved, they don't really like to stand up in front of people." I'm like: "That's cool. Just stick with us long enough." So there's these elements that really help round the student out. The earlier that you can tackle that and expose students to spatial thinking, the better.

AJAYI There's also the dollars and cents part of an education. If we're going to talk equity, we gotta talk dollars and cents. I'm wondering how these programs are contributing to that conversation.

DOWDELL It's a real challenge to look at architecture and see at face value why you would do it if you don't come from an independently wealthy background. Unfortunately, if you're a person of color, it's highly likely that you have fewer resources than others. That often translates into young people of color looking for opportunities that they have a passion for, but that will also help them pay the bills for people in their family. When you look at architecture, you're looking at a five-, six-, or seven-year education at the very least.



Having a fellowship that basically puts a group of students of color or Black students in the face of the architecture field and tells them, "You wanted the talent, here is the talent," I think is really important. Especially for Black designers, Black female designers, who are very rare in the field. It's important for me to be a representation of the kind of power that Black women designers can have, for firms to see, OK, I can actually hire a Black woman and she's actually going to commit and she's going to produce really good work.

So I find the fellowship to be an amazing opportunity. It can create networks that I did not have. A lot of these students come in and they have that experience. They say, "Yeah, my uncle is a designer," or "Yeah, my dad is a designer," or "My dad is an architect," or "My father owns a firm." I think this fellowship is perfect as a prototype for more than just NOMA, to say, OK, we actually need to work directly with schools, we need to work directly with institutions that are interacting with young designers in order to find this group of students of color that is constantly struggling to make it in this design field for multiple reasons. Reasons that are definitely systemic, that are definitely entrenched in a history that is all about inequality against Black people and people of color.

BARBARA NASILA

B.Arch. 2020, University of California, Berkeley

AT

CUNINGHAM GROUP

Minneapolis

The meaning of the fellowship—and the meaning of NOMA—is to build a community and to give opportunities to build each other up. We have to work together and we have to fight for each other and advocate for each other. Especially the new generation coming up, there are a lot of powerful voices, especially toward the sustainability sector. It's not just lowering emissions, but on the social level, it impacts people of color the most. As temperatures rise, those effects are going to become harsher and harsher. Think of people in favelas in Brazil, slums in India, these people who have lower incomes and who can't afford proper air-conditioning systems.

I'm not going to say which firm and call them out. But at one of the [previous] firms I worked in, we had to take a group picture. There were a lot of interns and they were very diverse, and I knew that's specifically why they were doing it. Then the VPs came and literally every single one was a white male. If you really want to make true change, then at the top levels, that's where you need to change the people. The people who are in charge of these businesses and political leaders, that's where diversity is most important because they're the ones who are able to take accountability.

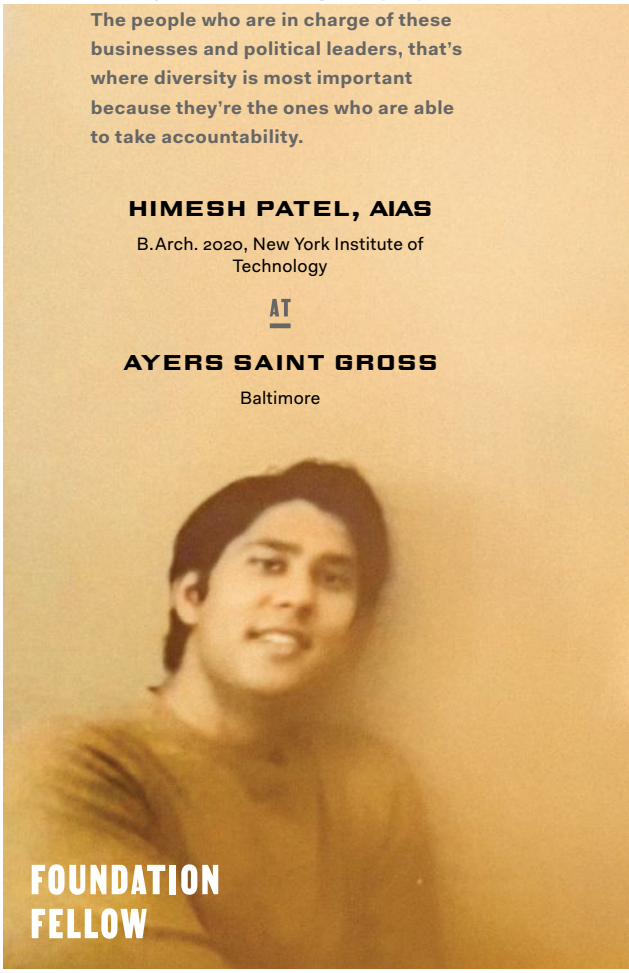
HIMESH PATEL, AIAS

B.Arch. 2020, New York Institute of Technology

AT

AYERS SAINT GROSS

Baltimore



It's fairly expensive because you have to have top-notch technology to handle all the computer modeling required now. And then on top of that, you look at the starting salary of an architect. When I went to career services at my school and looked it up, feeling excited, I saw it was $35,000. I was like, "Wait, what? Why didn't anyone tell me?"

I think that there's some work to be done in architecture in general to make sure that we're being compensated for the value that we create. If as a profession we're able to generate more fees because our clients understand the value, then that translates into higher starting salaries and a more attractive profession for people to whom money actually does matter. Which is most of the people who look like us.

Part of the approach of Project Pipeline is to provide that early exposure not just to the classroom, but to people who are in the profession who students can look up to and see that it is possible. It may not be easy, but it is possible. And then we're working with many firms that have expressed an interest in not just supporting Project Pipeline, but to some extent supporting scholarships. So we're trying to really ramp up that activity and work with AIA, specifically the Architects Foundation, on getting scholarships to NOMA students.

AJAYI I'm wondering what everyone's pulse has been around how the profession has responded to the bold demands that a lot of student organizations have placed on their programs. Even faculty members are speaking out. What's your interpretation of how architecture has responded?

LEE We are so proud of the students who have put themselves on the line to speak truth to power. It's been amazing to see it happen across so many campuses around the country. And I would say the response from universities, organizations, firms is lacking, in part because they don't have the language, they don't have the capacity. And they're trying to solve a problem today, as opposed to recognizing that this is not just a process, it is a change of process in perpetuity. In a large part, the profession has failed and will continue to fail at trying to solve issues of justice, because they're only looking at an end result. They're only looking at ways to get the students, or the professionals who are challenging them, out of their way. It's a way to get back to capital. So it's been really nice to see the vocal nature of the individuals who are pushing our larger profession.

HANDS I'm curious to see, and time will tell, what happens going forward. Right now it's a lot of talk, and there's some action, but it's not everywhere, and not every firm that has put out a statement has been pushing it forward right away. There's also social media that's blown up highlighting stuff that's been going on, stuff that we all talk about amongst ourselves, but now that it has a microscope on it, I think there's a greater chance that things will change. Black at SOM, Black at Gensler, Black at AIA, ARCH so White: those Instagram accounts highlight daily experiences that I can say, "Oh, yeah, I experienced that when I was there." Having it highlighted, everyone can see it, and there's just greater pressure for firms to address it. Or else it becomes known that these big companies haven't done anything about it and will continue to keep rolling as if nothing is wrong. Now there's so much focus on it, and because the initial response was so lacking, I think the added pressure is going to force the industry to change.

DANIELS How do you answer the issues related to social justice? How do you answer issues related to equity within the built environment? There is an inherent component that says as NOMA, an organization that is full of minority architects, we have a strong sensitivity to what that thing looks like. There is a desire to do good. From the administrative side, from the academic side, to the Large Firm Roundtable, there's been an outpouring of interest: How do we support students of color? How do we support programs of color around the country?

What has been lacking for so long is that level of engagement, that on both sides it's like, "We're not quite sure how to do this." You can't just throw money at every problem. And you can't say we've got to hire every student, because we have fewer students than most predominantly white institutions. The pool of highly qualified applicants is not huge, and even as you build it up, it's still not as great as what you're going to find at PWIs. That's just a dynamic that we're negotiating right now, and if we figure it out while the interest is still there, we'll make great headway.

This country is rooted in these issues. It's part of our foundation. People of color built the built environment. And so injustice, inequality, because it's rooted in that, is not going to be extracted overnight. The fact that we're having conversations about the same stuff that we marched for 60 years ago means that there's still a lot of work to do.

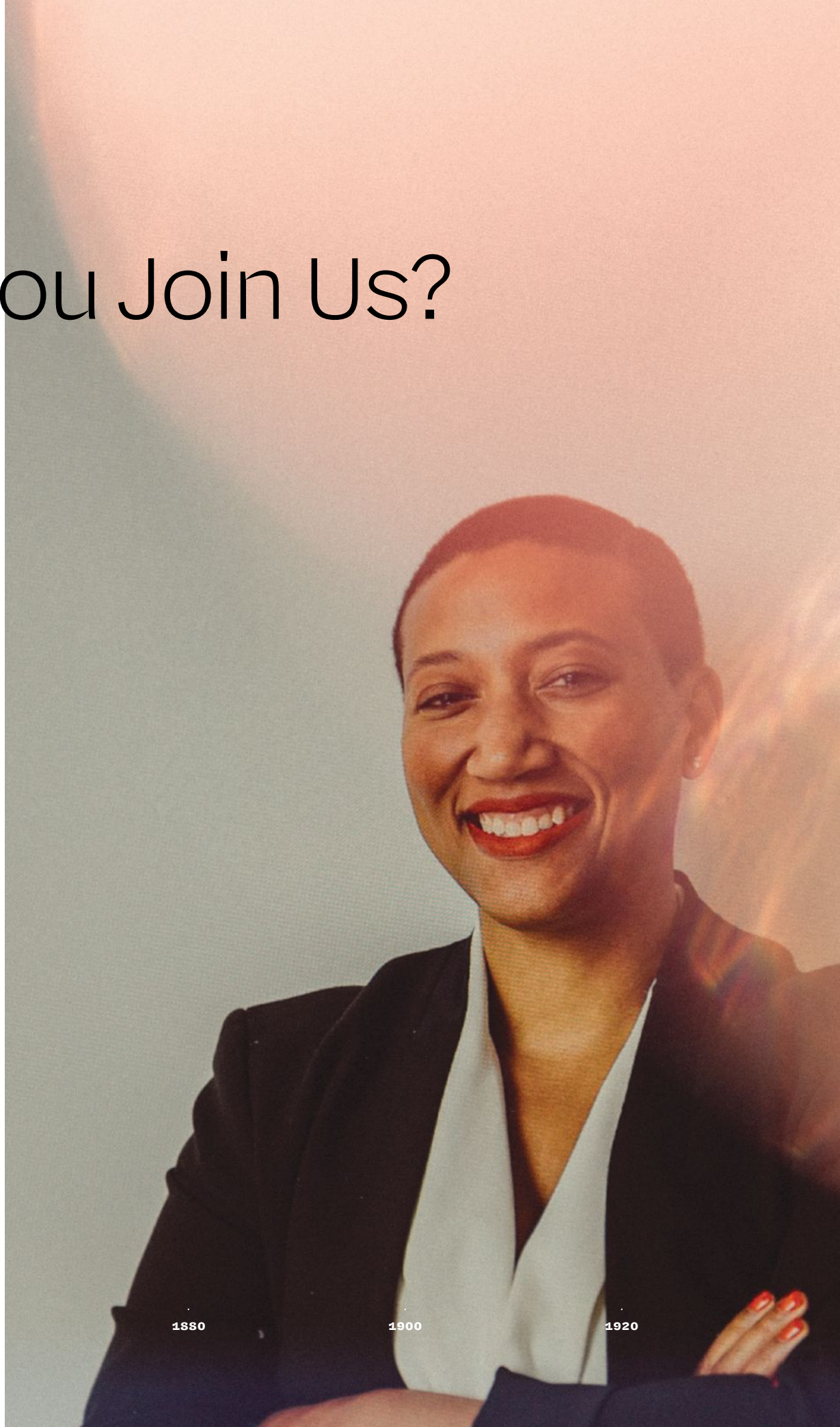
But I do believe that we can find ways to push the needle, to carve out new spaces, and put that sensitivity there. You have a diverse environment, you get a greater product. You have a monoculture, you get a horrible product. A diverse environment is able to withstand calamities. A monoculture gets wiped out really fast. The more we're able to push this idea of inclusion and what that truly means, and equity and what that truly means, beyond just a policy that checks it off, the more that it actually becomes part of the culture. That we believe in going out and getting diverse bodies of people from all the schools, not just from ones we're comfortable with. When we make that part of our standard operating procedure, then, yes, as Richie said, I think we can definitely see a huge change. But I encourage us not to take our eyes off the ball, because I think we did. And 60 years later, society is still at the same place.

DOWDELL I am actually borrowing this from Tonya Allen, president and CEO of the Skillman Foundation out of Detroit. She once said that diversity is about counting the people, and inclusion is about making the people count. More and more, this profession needs to ensure that the people who are shaping the future of the built environment for all of us really count, and that they really are representative of the society that we're serving.

> *Interviews have been edited and condensed. To read more, go to bit.ly/NOMAPipeline*

Will You Join Us?

TEXT BY KIMBERLY DOWDELL, AIA



1840 · The American Institute of Architects is founded · 1860 · 1880 · 1900 · 1920

Moon landing

THE NATIONAL PRESIDENT OF THE NATIONAL ORGANIZATION OF MINORITY ARCHITECTS CHALLENGES THE PROFESSION TO COMMIT TO INCREASING REPRESENTATION FOR BLACK ARCHITECTS.

On Sept. 12, 1962, before an audience of more than 40,000 people on the campus of Rice University, President John F. Kennedy delivered a speech that would define the 1960s in America. He said: "We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."

This bold statement was made more than two decades before I was born, but it resonates with me today more than ever. We were determined to make it to the moon, and we did. Now, in this decade, one of the greatest challenges that we must tackle with the same might is systemic racial injustice. Until all Americans are availed of the same opportunities and protections, we are all threatened by the insidious harm caused by racism and prejudice. This may not seem relevant to everyone, but please note that within two generations from now, the racial demographics of the United States will be different from what we see today: According to the Brookings Institute, the majority of people in the U.S. will be people of color by 2045. If we don't resolve our current issues with racial disharmony, we stand to jeopardize our collective future.

Racial healing and harmony are relevant to us as Americans, and to those of us who have chosen the noble profession of architecture. Our duty is to protect the health, safety, and welfare of the public—the entire public. The buildings that we design are meant to shelter everyone safely and, to the extent possible, to create delight. In the American context, architecture has historically been a profession of privilege: a formidable field of endeavor, reserved primarily for white men of means. Only in recent decades have we seen a significant uptick in the registration of women architects. For Black architects, their numbers have essentially moved from zero to 2% of all licensed architects in the United States since architecture organized as a profession in 1857.

When architecture emerged as a profession in the U.S., slavery was still legal. Let that sink in.

Presently, Blacks represent approximately 13% of the U.S. population. Out of approximately 116,000 licensed architects, 478 women and 1,847 men are in the Directory of African American Architects. Yes, that still equates to just 2% of the profession. In 2020. There's a gap here.

Why does this matter? I'm glad you ask. It matters because representation matters when it comes to protecting the health, safety, and welfare of the entire public. For far too long, Blacks and other racial and ethnic minorities have suffered under the cruel hands of injustice in this country, including land theft, bondage, internment camps, Jim Crow, and redlining, all of which have evolved into what we know today as systemic racism or institutional oppression. The time to end these atrocities is now.

As a profession, architecture can set an example for industries nationwide. This is the moment when we demand a new frontier for architecture as we seek to design a stronger and more just America. United We Stand.

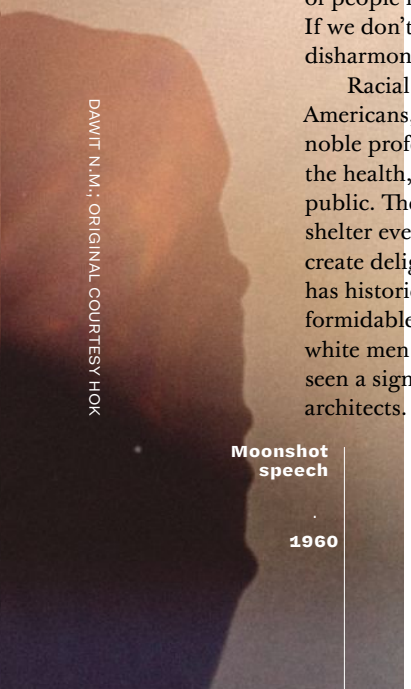
In my capacity as NOMA National President, I have been working very closely with myriad industry partners to essentially build bridges between NOMA and other organizations also committed to diversifying the profession of architecture. One such organization is AIA's Large Firm Roundtable, which represents the 60 largest architecture firms in North America. The CEOs of these firms, led by LFRT chair and Shepley Bulfinch CEO Carole Wedge, FAIA, have rallied around this issue over the past 18 months and co-authored with NOMA the 2030 Diversity Challenge for Architecture.

The task is straightforward: Double the percentage of African American architects from 2% to 4% by 2030. That would roughly equate to 5,000—or more—Black registered architects in the U.S. in this decade. This is probably as ambitious as sending a person to the moon in 1962.

Today, I say to you, we must choose to double the number of African American architects in this decade, and in Kennedy's words "not because [it is] easy, but because [it is] hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."

This is our challenge as a profession.

Will you join us?



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Editorial: Building a Legacy

TEXT BY KATIE GERFEN

It's hard not to have legacy on the brain after learning about a project like Moody Nolan's Legacy House initiative, which will see the firm design and build 12 houses—one in every market in which it has an office—over 12 years, and donate each to a family in need (you can see the first completed house on page 24). It is, in the purest form, an example of architects giving back to their communities with architecture. And it speaks to the power of design to make positive change in people's lives.

The houses contribute to not only the legacy of the firm but also that of the owners, each of whom is receiving much more than shelter when they accept the keys. For a family experiencing homelessness, the sense of security in having a permanent residence can change the direction of their lives. But the Legacy House offers something that most affordable housing does not: equity. In a country with a long history of discriminatory housing practices built upon systemic racism, the ability to obtain a home loan is cruelly out of reach for the low-income families and communities of color that need it most. The equity a mortgage-free house provides is a stepping stone—one that can catalyze change for an individual, and through them, a community.

While giving away a house is out of reach for many firms, finding inventive ways to give back to communities through design can contribute to creating more equitable communities around the country. It might seem futile to focus on making the world a better place one intervention at a time, but those actions, says CEO Jonathan Moody, AIA, are like "a drop in the ocean that can begin to create waves."

Whether it's physically building a legacy of houses or metaphorically building one of social change, the status quo systems in place are clearly not enough. The recent calls to improve diversity, equity, and inclusion in our society and in the field of architecture and design are no longer possible to ignore. And while dismantling systemic racism is urgent work, it will take time. In the feature well of this issue, we talk to architects, DEI experts, young professionals, and thought leaders to identify actions that individuals or companies can take to begin the process of enacting change. It is a discussion far too large for one issue, and one that we will continue to bring to these pages going forward. What is clear is this: If the design community—every individual, school, firm, and organization—works together with humility and a sustained commitment to action, incremental change can, and will, turn to waves of progress.

NOMA President Kimberly Dowdell, AIA, knows that it will take the whole community to enact radical and necessary change in the profession, which is why in her essay "Will You Join Us?" (page 84), she sets a moonshot goal to double the percentage of Black licensed architects in the profession from the current 2% to 4% by 2030. This will require commitment to change, accessibility, and inclusivity at every step, and by every institution, on the road to licensure—yet, this will still fall far short of the 13% of the current U.S. population represented by Black people. But it is progress. After all, the best legacy an industry can have is proof of change for the better. We need to answer Dowdell's call and be ALL in, together.

kgerfen@hanleywood.com

STEPHEN VOSS

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