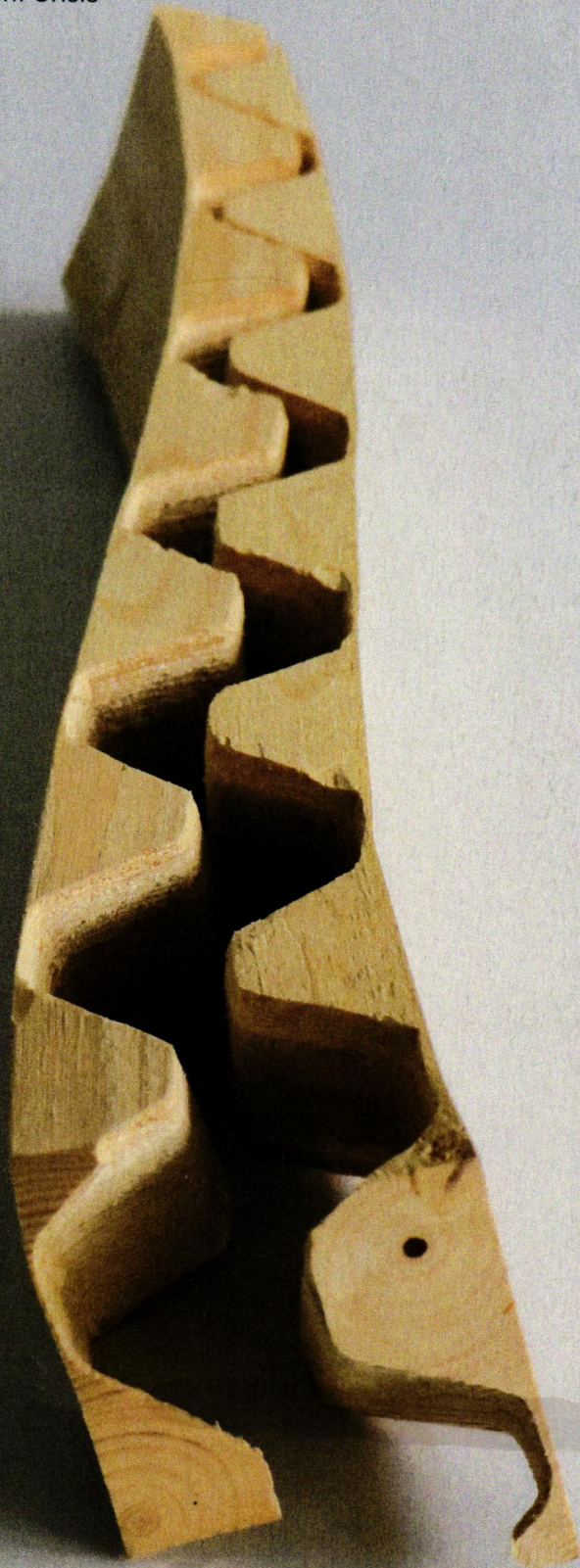


Büro Koray Duman Tiffany Brown on Necessary Change
Johnsen Schmalig Reduce Tax Liability with Research
EYRC Architects James Garrett Jr. on Anti-Racist Action
A Design School Enrollment Crisis

architectmagazine.com
The Journal of The American
Institute of Architects



R+D Awards

Seven innovations that improve the
built environment—and its impact



NEW OPTIONS FOR INSULATING AND VENTILATING WOOD-FRAMED SLOPED ROOFS

A continuing education preview sponsored by ZIP System® building enclosures

A successful roof system has the ability to create an unbroken line of defense in all four control layers: water, air, moisture and thermal controls. Additionally, it should have a backup means to prevent damage in the event water or moisture does breach the barriers. Unanticipated water may cause wood to rot, decrease some insulation efficacy and drain into the building causing additional damage. Beyond simply providing structure and covering, wood-framed roof design has evolved into a complete, coordinated assembly through four standard design and construction options.

VENTED ATTIC

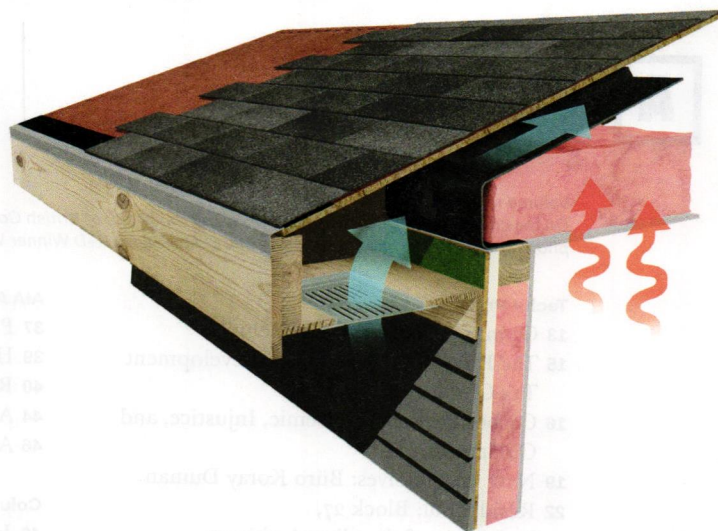
Currently the most common type of wood-framed roof assembly, vented attics rely on engineered trusses or rafters with ceiling joists to form an open unconditioned attic space. In this type of assembly, the water barrier is located on the roof surface above the attic, while the air barrier is along the ceiling surface below with the insulation that serves as a vapor retarder and thermal barrier. When properly designed and constructed with the needed levels of insulation, as well as the integrity and continuity of all barriers and ventilation, you can expect this roofing system to perform very well over time in almost all climate zones.



WOOD-FRAMED SLOPED ROOFS NEED TO PROVIDE ALL THE SAME FUNCTIONS AS EXTERIOR WALLS, IF NOT MORE SO.

CAVITY-VENTED INSULATED PITCHED ROOF

For circumstances where a horizontal ceiling and attic space above do not meet the design needs of a building, the assembly may be more compact, creating a pitched roof and sloped ceiling all in one. The same barrier and ventilation needs must still be addressed.



Unvented roofs with conditioned attic spaces place the air, vapor and thermal control layers near the roof sheathing.

Vented, unconditioned attics are among the most common roofing systems. Reducing uncontrolled airflow is key to maintaining insulation effectiveness in this assembly.

The common approach is to use roof framing members that are deep enough to carry the structural loads, fit the needed level of insulation in between and still provide space for ventilation. In some climate zones, this requires a deeper flat truss or other engineered member. Regardless, the water barrier will still remain on the exterior surface of the assembly, while the air barrier and vapor retarder are along the inner face. Insulation is installed between the framing members to the level needed.

TOP-VENTED INSULATED PITCHED ROOF

If providing enough ventilation and insulation all in one framing member depth is not possible, the alternative is to construct an additional ventilation layer on top of the framing layer. In this case, the framing cavity is filled with insulation or rigid insulation is applied over a timber frame and ceiling system.

A minimum 2-inch air space is provided as an "over-roof" to carry away any moisture that escapes up through joints

in the insulation. The ventilation space also helps keep the underside of the over-roof surface cold, thus avoiding snow melting and forming ice dams. While this over-roof approach is effective for ventilation, it can be more costly to construct since it involves the creation of the ventilation channel that needs to support the sheathing and roofing water barrier.

UNVENTED INSULATED PITCHED ROOF

This assembly uses a sloped roof/ceiling assembly with insulation filling the entire depth between ceiling and roof sheathing. It can be constructed of rigid insulation that serves as an air barrier between the inner and outer surface, such as closed-cell polyurethane or polyisocyanurate with water-, vapor- and air-barrier capabilities inherent to the insulation. In this case, the roof system relies on the multiple properties of the insulation and other materials to form fully continuous air, thermal and moisture barriers. Therefore, no ventilation is necessary.

Wood-framed sloped roofs need to provide all the same functions as exterior walls, if not more so. The result will be a successful roofing system that offers thermal resistance and protects against unwanted air, water and vapor. Learn more at TrustZIPRoof.com.

Learn more about maintaining control barrier continuity in roof assemblies from this online CEU course sponsored by ZIP System™ Roof Assembly: "New Options for Insulating and Ventilating Wood-Framed Sloped Roofs."

Register for free at hanleywooduniversity.com/course/7063

© 2020 Huber Engineered Woods LLC. ZIP System, the accompanying ZIP System logo and design are trademarks of Huber Engineered Woods LLC. Huber Engineered Woods' ZIP System® products are covered by various patents. Please see ZIPSystem.com/Patents for details. HUB 22484-1 06/20.

A Contents

Volume 109, number 7, July 2020.

On the cover: R+D Winner Zippered Wood, by University of British Columbia, HiLo Lab; University of Colorado, Denver, LoDo Lab; and HouMinn Practice; photo by Alex Preiss and Derek Mavis/HiLo Lab. Below: R+D Winner Walking Assembly, by Matter Design and CEMEX.

Tech + Practice

- 13 Opinion: Dismantle and Rebuild
- 15 The Rules: The Research & Development Tax Credit
- 16 CarbonPositive: Pandemic, Injustice, and Climate Change
- 19 Next Progressives: Büro Koray Duman
- 22 Residential: Block 27, by Johnsen Schmalig Architects
- 29 Typology: Culver Steps, by Ehrlich Yanai Rhee Chaney Architects

14th Annual R+D Awards

- 66 Seven innovations in building science and technology that will help architects to design safer, greener, and more equitable environments.

AIA Architect

- 37 Planning for Multiple Scenarios
- 39 Holistic Solutions for Homeownership
- 40 Rebuilding Trust
- 44 A Perfect Storm
- 46 A Tipping Point for Systemic Injustice

Columns

- 49 James Garrett Jr. Lists Actions for Architects, Institutions, and Business Owners to Combat Systemic Racism by Blaine Brownell, FAIA
- 55 The Looming School Enrollment Crisis by Thomas Fisher, ASSOC. AIA

Editorial

- 80 Time to Stand Up by Katie Gerfen



Volume 109, number 7, July 2020. ARCHITECT® (ISSN 1935-7001; USPS 009-880) is published monthly by Hanley Wood, 1152 15th Street NW, Suite 750, Washington, DC 20005. Copyright 2020 by Hanley Wood. Opinions expressed are those of the authors or persons quoted and not necessarily those of The American Institute of Architects. Reproduction in whole or in part prohibited without written authorization. All rights reserved. Printed in the USA. Periodicals postage paid at Washington, DC, and at additional mailing offices. POSTMASTER: Send address changes to ARCHITECT, P.O. Box 3494, Northbrook, IL 60065. Canada Post Registration #40612608/G.S.T. number R-120931738. Canadian return address: IMEX, P.O. Box 25542, London, ON N6C 6B2. For subscription inquiries, address changes, and single-copy sales (\$10 in the U.S., \$15 in Canada, \$20 for other countries, payable in advance in U.S. dollars) write to ARCHITECT, P.O. Box 3494, Northbrook, IL 60065 or call 847.291.5221 or toll-free 888.269.8410. REPRINTS: Call or email Wright's Media: 877.652.5295 or hanleywood@wrightsmedia.com. DISCLOSURE: ARCHITECT® will occasionally write about companies in which its parent organization, Hanley Wood, has an investment interest. When it does, the magazine will fully disclose that relationship. PRIVACY OF MAILING LIST: Sometimes we share our subscriber mailing list with reputable companies we think you'll find interesting. However, if you do not wish to be included, please call us at 888.269.8410.

Successful Washroom Design in the Age of COVID-19

Bolster your reputation for thoughtful design that supports workforce health & safety.

Arguably one of the most difficult design challenges today may be one often taken for granted: the washroom.

With few exceptions, the washroom has emerged as a make-or-break test for business, medical, educational, and manufacturing leaders anxious to put their organization back to work with confidence and safety. If owners, architects, and facility managers get the washroom wrong, workforce distrust and doubt about returning will spread across the enterprise like the virus itself.

Dr. Greg Poland, professor of medicine and infectious diseases at the Mayo Clinic in Rochester, Minn., doesn't mince words when describing the challenges ahead. Consider washroom water faucet and door handles, for example. "We swabbed them and put petri dishes in the incubator. The handles [were] grossly infected with bacteria and viruses."

Today's best practices to prevent the spread of infection may be the improvised and ad hoc design solutions developed in hospitals, emergency rooms, and other essential frontline washrooms over the last few months. What's the best way to inform your design with this hard-won understanding? It's a question Avi Bar and Paul Kechejian have given a lot of thought.

Both professionals live and work in the New York City area. Their proximity to a hotspot and service to medical centers throughout the ordeal may offer highly-informed, real-world insights available nowhere else.

Bar and Kechejian hold national and regional positions at American Specialties, Inc. (ASI), a respected U.S. manufacturer of sanitizer dispensers, partitions, lockers, visual display products, and other washroom supplies. Their national and regional perspective allows them to engage with architects as well as facility owners like New York's top hospitals. Bar and Kechejian share a few words on the lessons learned:


- **Wide Design Freedom.** "Identify a supplier that presents you with a large design palette," says Kechejian. "Don't limit yourself to a narrow range of material choices just because that's all the supplier offers. For example, look for a source that represents metal, plastic, and phenolic partitions across a wide array of sizes and colors."
- **Think Open Source.** Some soap and sanitizer companies offer proprietary products that may sound good upfront, but lock the owner into a costly long-



term contract. "Don't specify soap or sanitizer products that tie-up your owner financially. Non-proprietary dispensers accept any qualified product, which can increase availability and reduce costs," Kechejian advises.

- **Collaborate.** Our understanding of and the demands placed on us by COVID-19 are constantly shifting. Your supplier should have the manufacturing agility to respond to nearly any design requirement. ASI, for example, supplied and installed metal partitions for an emergency Covid-19 field hospital in Old Westbury, a village on the north shore of Long Island, in 72 hours.
- **1% Risking 100%?** Don't underestimate the washroom. It may represent less than 1% of the building cost, but it puts 100% of the occupants at odds or at ease with their employer's return-to-work decision.

Learn more about successful washroom design at www.ASIGroup.us.



LET YOUR IMAGINATION
GO OUTSIDE AND PLAY.

Design/Build: Jirsa Construction
Photo: Nick Laessig



We're always working on new ways to help you push the limits of your creativity. From the refined look of more glass and narrowed sight lines to door technology that turns a wall of glass into a moving masterpiece, our goal is to bring your next design project to life. Unmatched aesthetics and performance, that's the natural result of windows that never compromise.



**SIERRA
PACIFIC**
WINDOWS

SierraPacificWindows.com | 800-824-7744

A Division of



SIERRA
PACIFIC
INDUSTRIES

Architect: Morphosis Architects
Curtain Wall Consultant: Arup, New York, NY
Photograph: Matthew Carbone

ARCHITECT

The Journal of The American
Institute of Architects

Editor-in-Chief

Katie Gerfen
kgerfen@hanleywood.com

Managing Editor

Laurie Elden
lelden@hanleywood.com

Technology and Practice

Editor
Wanda Lau
wlau@hanleywood.com
@wandawlau

Intern

Madeleine D'Angelo
mdangelo@hanleywood.com

Features

Senior Editor
Eric Wills
ewills@hanleywood.com

Multimedia

Videographer/Video Editor
Rob Grauert Jr.
rgrauert@hanleywood.com

Art Director

Robb Ogle
rogle@hanleywood.com

Contributing Editors

Aaron Betsy
Blaine Brownell, FAIA
Daniel Davis
Thomas de Monchaux
Elizabeth Evitts Dickinson
John Morris Dixon, FAIA
Eva Hagberg
Thomas Fisher, ASSOC. AIA
Cathy Lang Ho
Karrie Jacobs
Edward Keegan, AIA
Ian Volner
Mimi Zeiger

Picture Perforated

The first academic building to open on Cornell Tech's Roosevelt Island campus, the **Emma and Georgina Bloomberg Center** aims for net-zero energy performance, a mission that drives its advanced aesthetics. Designed by **Morphosis**, its facade of pixelated perforated aluminum and curved glass provides both thermal protection and inspiration for a new generation of research. Read more about it in **Metals in Construction** online.

 **Ornamental Metal Institute of New York**

WWW.OMINY.ORG

Design Group

Executive Vice President,
Chief Content Officer
Jennifer Pearce
jpearce@hanleywood.com
703-407-6029

Senior Vice President,
General Manager Digital
Christie Bardo
cbardo@hanleywood.com
703-307-3014

Advertising

Account Coordinator
Katina Billado
kbillado@hanleywood.com
802.233.1976

Canada

D. John Magner
jmagner@yorkmedia.net
416.598.0101, ext. 220

China, Hong Kong, Taiwan

Judy Wang
judywang2000@vip.126.com
86.13810325171

Executive Vice President
Paul Tourbaf
ptourbaf@hanleywood.com
847-778-9863

Vice President of Account
Development & Sales
Administration
Philip Hernandez
phernandez@hanleywood.com
703-599-3076

Marketing

Executive Director of
Marketing
Lauren Fitzgerald

Group Director, Audience
Marketing & Circulation
Chris Lustan

Production

Senior Director,
Print Production
Cathy Underwood

Senior Director,
Print Production
Margaret Coulter

Production Manager,
Stephanie Fischer

Hanley Wood University/ Education

Jim Bagan
jbagan@hanleywood.com
773.824.2428

List Rentals

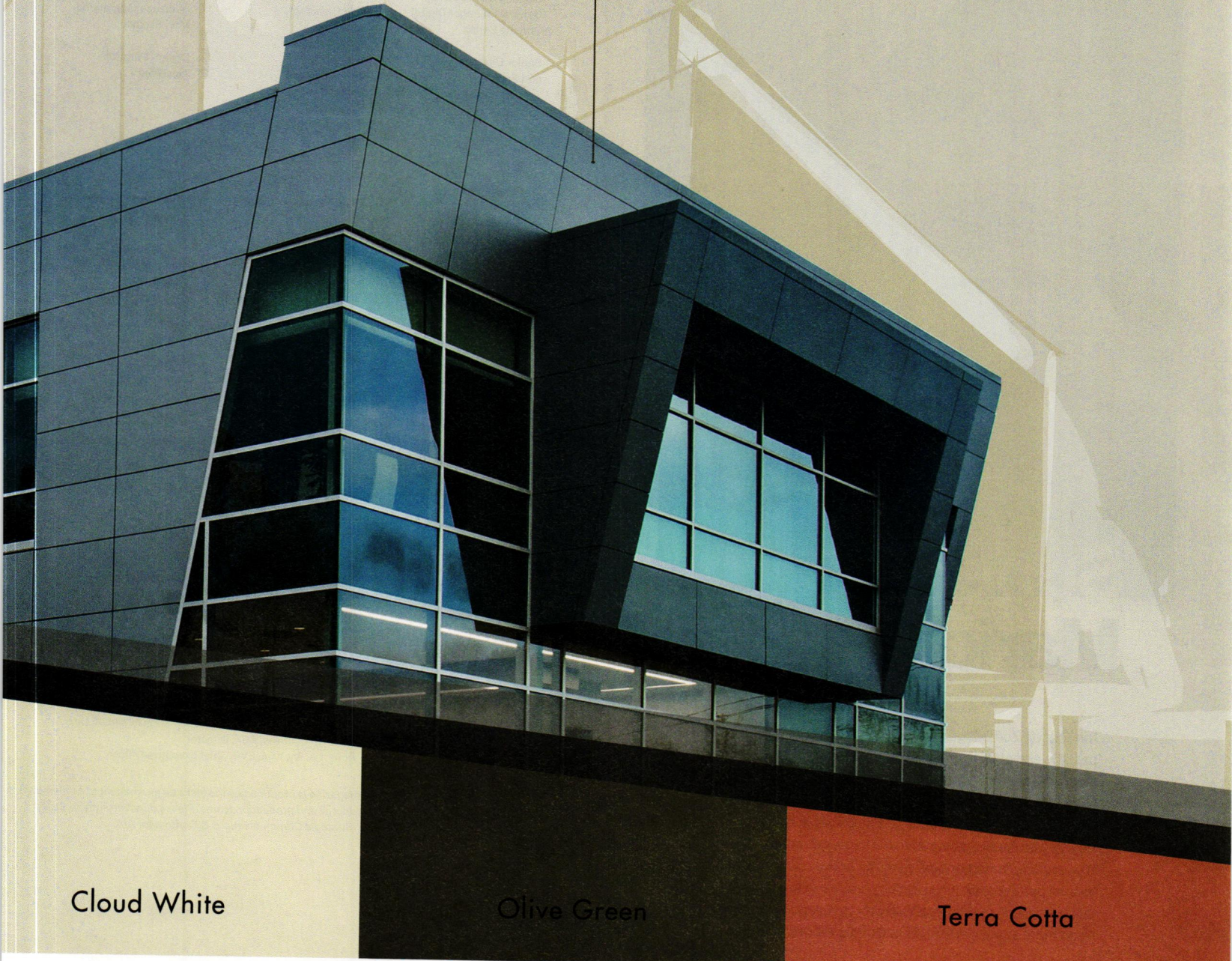
The Information Refinery
Brian Clotworthy
brian@info refinery.com
800.529.9020

Copyright 2020 by Hanley Wood, 1152 15th Street NW, Suite 750, Washington, DC 20005.
202.452.0800. Reproduction in whole or in part prohibited without written authorization.
All rights reserved. Printed in the USA.

Guy Brown Office Building
Brentwood, TN
Featuring Limestone Blue Finish

ALPOLIC[®]
METAL COMPOSITE MATERIALS

Your Design | **Perfected**



Cloud White

Olive Green

Terra Cotta

Photo Credit: David Braud

MATTE SERIES

Exceptional projects demand exceptional materials.

Architect and Engineer: Tappan Zee Constructors, LLC
 Lead Designer: HDR
 Photograph: New York State Thruway Authority



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.

 **Steel Institute of New York**

WWW.SINY.ORG

ARCHITECT

The Journal of The American Institute of Architects

Hanley Wood Media

Chief Operating Officer
Andrew Reid

Senior Vice President,
General Manager Digital
Christie Bardo

Senior Director, SEO
and Analytics
Jennifer Malkasian

Executive Vice President,
Chief Content Officer
Jennifer Pearce

Vice President,
Editorial
John McManus

Vice President,
Digital Strategy and
Operations
Bridget Forbes

Executive Vice President
Paul Tourbaf

Vice President,
Audience Operations
Mari Skelnik

Design Director
Tina Tabibi

Hanley Wood

Chief Executive Officer
Jeff Meyers

Group Vice President,
Talent Strategy
Kurt Nelson

Vice President of Account
Development & Sales
Administration
Philip Hernandez

Chief Financial Officer
Melissa Billiter

Senior Managing Principal,
Advisory Group
Tim Sullivan

Chief Operating Officer
Andrew Reid

Executive Vice President,
National Sales
Amy Dudley



The American
Institute
of Architects

2020 Board of Directors

L. Jane Frederick, FAIA, President
 Peter J. Exley, FAIA, First Vice President
 Jason C. Winters, AIA, Secretary
 Evelyn M. Lee, AIA, Treasurer
 Emily A. Grandstaff-Rice, FAIA, At-Large Director
 Daniel S. Hart, FAIA, PE, At-Large Director
 Timothy C. Hawk, FAIA, At-Large Director
 Mark L. Levine, FAIA, At-Large Director
 Britt Lindberg, AIA, LEED AP, At-Large Director
 Jessica A. Sheridan, AIA, At-Large Director
 Becky Magdaleno, 2020 CACE Director
 Yiselle M. Santos Rivera, ASSOC. AIA, Associate Director
 Sarah M. Curry, ASSOC. AIA, AIAS, Student Director
 George B. Forsythe, PH.D., BG, US ARMY (RETIRED), Director
 Vivian E. Loftness, FAIA, Director
 Robert A. Ivy, FAIA, EVP/Chief Executive Officer

The AIA Architect section of this magazine is produced by the Institute as a benefit to its members in partnership with ARCHITECT's editorial and production teams. Please direct any questions or comments to Frank Scanlan, MD, Strategic Communications & Content for AIA.

hanleywood



PEFC certification applies to text only



WOOD YOU



BELIEVE?



Who knew ultra-durable top rails could look this good? DesignRail® from Feeney® makes it easy for your customers to bring their vision to life with its wood grain powder-coated top rail finish that provides an extra layer of durability, coupled with the beautiful look of wood. But don't take our word for it, discover how Feeney can elevate any project with a Cherry, Walnut or Weathered Gray wood grain top rail.

Become a believer at FeeneyMakesItEasy.com.

Feeney Makes it Easy.

feeney® 

HAVE FORMWORKS, WILL TRAVEL

To understand the design power of KnitCandela, start with a pair of suitcases.

It's not often you can carry the formworks for a 5-ton, 19-foot-tall hyperbolic paraboloid (hypars) concrete shell in a pair of suitcases.

But that's exactly what Dr. Mariana Popescu and her colleague from Switzerland's Block Research Group (BRG) carried onboard a flight from Zurich to Mexico City.

The contents of their suitcases formed the basis for an award-winning tribute to renowned Mexican-Spanish architect Felix Candela (1910–1997) called KnitCandela. The curvy, sinewy concrete shell was designed and built by BRG, Zaha Hadid Architects Code, and UK-based Architecture Extrapolated.

WIDTH OF SWITZERLAND

"We packed 50 square meters of knitted drapes in two suitcases," explains Popescu. The fabric represents about 350 kilometers (roughly the width of Switzerland) of polyester yarn, describing a complex formwork mold the team used to build the shell over a two-week period in 2018. The Museo Universitario Arte Contemporaneo (MUAC) in Mexico City hosted the exhibit.

Popescu is an architect and Ph.D. doing post-doctoral research in the casting of double-curved geometries in concrete using 3D knitting.

Why knitting? Constructing extreme geometrical forms with concrete ordinarily requires casting molds built with timber or with milled foam supported by scaffolding. It's a time-consuming, one-off process that produces lots of waste.

NEXT-GEN APPLICATION

"With textiles we move away from a rigid system to a flexible formwork system," says Popescu. "A flexible formwork system means there's some sort of membrane that's being tensioned to gain its 3D geometry. This can be done in various ways. It's not a new idea and has been tried throughout the last century but never gained traction because of the lack of computational design and fabrication tools."

BRG terms the next-gen, textile-based approach KnitCrete. "Knitted textiles can be made directly into 3D geometries, so it's more efficient. It minimizes the need for cutting patterns to create spatial surfacing. You can also add channels and openings without cutting, gluing, and stitching," observes Popescu. Compared to conventional weaving, knitting allows for more directional variation and better supports additional formwork elements, such as insulation, electrical components, and HVAC systems.

BETTER CONSTRUCTION

To help turn the precisely fabricated knit into a rigid 3D shape, the fabric, the shuttering component, is supported by a load-bearing

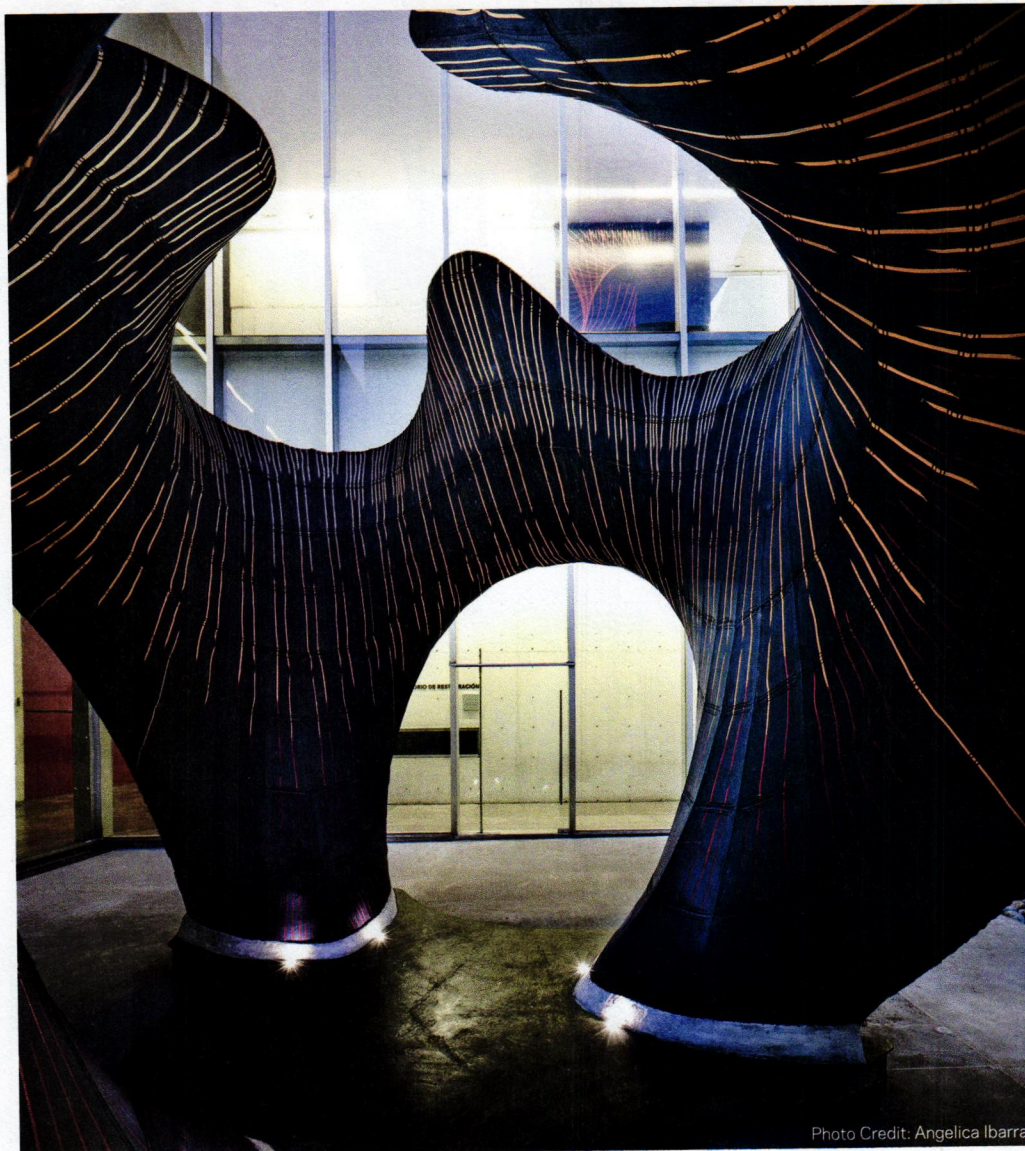


Photo Credit: Angelica Ibarra



Photo Credit: Lex Reiter



Photo Credit: Mariana Popescu



Photo Credit: Angelica Ibarra

cable net. The fabric is coated with a specially formulated cement paste.

In many respects, the precise off-site nature of the KnitCrete process resembles modular construction. The net result is a complex formworks mold that drastically reduces the need for field effort and uncertainty, which vastly simplifies logistics.

HOLD YOUR BREATH

With so much of the formworks meticulously choreographed 9,677 miles away in Zurich, was there anything left to surprise or delight in the MUAC courtyard? After all, this was the first time BRG used knitted textiles at an architectural scale.

“We had no doubts about the science and computations behind the formworks,” Popescu

says. “Even so, you’re not quite sure how it will all work until you’re standing there in front of it. You hold your breath. Wow, this is happening. There’s no way this isn’t happening,” she smiles.

HIGH PERFORMANCE OUTCOME

KnitCandela was an immediate sensation, earning a half-dozen notable awards and distinctions. How should architects understand the larger lessons of KnitCandela?

Consider a Formula 1 car race, Popescu advises. You won’t find Formula 1 racers in city traffic. But the innovations used to create high-performance motor vehicles often find their way into mainstream design and manufacturing. Likewise with KnitCandela. The proven techniques used to realize sophisticated

geometries in concrete now have far broader possibilities in residential and commercial design. And are simple enough to carry in a suitcase.

To learn more, visit BuildwithStrength.com.


Design: ZHCODE: Filippo Nassetti, David Reeves, Marko Margeta, Shajay Bhooshan, Patrik Schumacher; BRG: Mariana Popescu, Matthias Rippmann, Tom Van Mele, Philippe Block

KnitCrete Technology: BRG: Mariana Popescu, Tom Van Mele, Philippe Block; Chair of Physical Chemistry of Building Materials, ETH Zurich: Lex Reiter, Robert Flatt

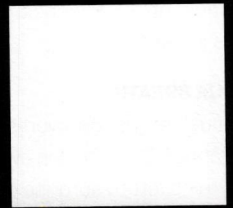
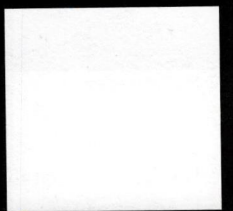
Fabrication and Construction: BRG: Mariana Popescu, Matthias Rippmann, Alessandro Dell’Endice, Cristian Calvo Barentin, Nora Ravanidou; R-Ex: Alicia Nahmad Vazquez, Horacio Bibiano Vargas, Jose Manuel Diaz Sanchez, Asunción Zúñiga, Agustín Lozano Álvarez, Miguel Juárez Antonio, Filiberto Juárez Antonio, Daniel Piña, Daniel Celin, Carlos Axel Pérez Cano, José Luis Naranjo Olivares, Everardo Hernández, Ramiro Tena

Your Voice Matters

ARCHITECT is about you, the people who enrich the design community with your perspectives, ideas, and talents. We are seeking contributors to write thoughtful, timely, and provocative opinion articles. What does the industry need to hear? And how can it make a better, greener, and more equitable built environment?



> Submit your one-paragraph pitch
for a 600-word essay to
stories@architectmagazine.com.



Opinion: Dismantle and Rebuild

TEXT BY TIFFANY BROWN, ASSOC. AIA



In the midst of a global health pandemic, another pandemic is shaking up our country as the world watches: Systemic racism has been centuries in the making, but recent acts of police brutality have brought it to the forefront. As the voiceless act out in rage, those with a voice—including architects, creators of the built environment—are frantically seeking to end the sickness in our society, once and for all.

Calls to defund the police have been met with outcries. Though such measures require time and a democratic process that includes all citizens of this country, I view reducing police funding as more like reimbursing our communities—freeing up resources for programs that may promote reconciliation, collaboration, or something that we have yet to dream of.

Did we ever consider the impact of defunding state and national parks, environmental protections, or even the U.S. Postal Service? As a student of Detroit Public Schools, I watched as all art programs were defunded midway through my middle school years. Did anyone think about how that would affect the future of youth in those programs?

American culture has a long history deeply rooted in the design of inequitable practices and institutional

systems of oppression. Together, as individuals, let's begin to explore and dismantle the barriers set in place so long ago. Let's commit to rebuilding equitable structures at all levels. Society must invest in community, arts, and leadership education for every person, every child. We must begin to enact and navigate the monumental change that is necessary. And it starts from within.

In his keynote speech at the 1968 AIA Convention, Whitney M. Young Jr. rightly laid out why change would require an integrated approach: "The crisis is not in our cities, ladies and gentlemen. The crisis is in our hearts, the kind of human beings we are. And I submit to you that if you are a mother or a father you are today being challenged either silently by young people or you will be challenged even more violently by them, but you are risking the respect of generations not yet adults and generations yet unborn."

I am among the generations that Young warned would come. Like many others, I was affected by the discriminatory urban renewal efforts of Robert Moses that seeped into the policies and procedures of our profession nationwide. I grew up in an environment that was an incubator for drugs and crime, physically and subliminally caged in by a black wrought iron fence. I am a survivor of racist city planning.

I broke through those barriers using the strength of my love for art, and my determination to beat the odds. I'm a Black female with an M.Arch. and an MBA. I am a designer of the built environment.

I refused to be seen as "disadvantaged youth." I am my ancestors' wildest dreams.

My generation has our work cut out for us. We must put systems in place that will help diversify the talent pool and, in turn, the leaders in the profession.

To my fellow designers—especially those with the agency to make change—I ask you to engage now. Ask how you can be a part of the change. Ask what you can do with and for your colleagues, clients, and peers of color. Ask how their lives were impacted by discriminatory practices and policies that many of you will know now or see.

Revisit your promotion policies and implement change in your firm now. Make a conscious effort to bring in minority leadership. Partner with entities that can assist you in diversifying your staff. Make it a core value.

Don't limit change to your work: Take the initiative and learn America's history of racial injustice. Read, listen, and watch educational content. Many resource lists have been put together; go and find them.

We must meet this moment now and abolish systemic racism in its tracks. We are the catalysts for humanity. We are history in the making.

Based in Detroit, Tiffany Brown, ASSOC. AIA, is executive manager of the National Organization of Minority Architects and raises awareness on how representation impacts firm practice, culture, and education.

Health, safety, and welfare are the bedrock of architectural practice.

Hanley Wood congratulates and thanks SAFTI *FIRST* for supporting enlightened standards in building regulation, design, and construction.

The Rules: The Research & Development Tax Credit

TEXT BY TERRI PETERS

Introduced in 1981 as an economic recovery measure and amended continually thereafter, the federal Research & Development tax credit aims to increase domestic technological advancements by allowing companies to claim research-related employee wages and other allowable expenses as adjustments. The economic conditions brought about by the COVID-19 pandemic has resulted in “many companies experiencing liquidity issues,” says Greenville, S.C.-based Adam Quattlebaum, a partner at accounting firm Dixon Hughes Goodman. “The R&D credit is a great mechanism to address this through reducing estimated tax payments, reducing tax liability, and by requesting refunds for previous ‘open tax years’ paid.” This window typically stretches back three years.

The credit can offset future tax liability as well. “Oftentimes, research credits exceed a firm’s tax liability,” Quattlebaum says. “In this situation, excess credits can be carried forward for 20 years to offset future tax liability.”

He estimates that the credit “typically ranges from 5% to 10% of eligible research expenditures; that is, if a firm has \$1 million of eligible research costs, the tax credit and associated cash savings could be \$50,000 to \$100,000.”

To qualify, the work needs to involve the design of new products or processes, the enhancement of existing products or processes, or improvement upon existing prototypes or software. Many firms leverage time-and-expense

software to track eligible wages and costs in detail, but they can estimate qualified costs as well.

Brian Aumueller, managing director of the consulting firm Alliantgroup’s New York office, has written about ways that architects specifically can qualify for the R&D credit. Eligible tasks can include employee time and relevant expenses relating to sustainable innovations; for example, work that could help a project achieve LEED certification, schematic design for any project type, and conducting environmental performance and impact analyses.

Since 2014, Seattle-based LMN Architects has claimed the tax credit to offset wage costs in research and development conducted largely by its internal LMN Tech Studio. The six-designer group splits its time between project-based research and product development of tools and processes for general use. LMN recently claimed the credit for some employee time spent on the design for the Seattle Aquarium’s Ocean Pavilion. “The tax credit supported our design work incorporating parametric analyses for daylighting in this aquarium context,” says partner Sam Miller, FAIA. The project prioritized access to daylighting and views, but also had “to minimize the amount of direct sun on the exhibits.”

Firms might not realize their design work can qualify for the tax credit, Miller says. “In our design process, we use iterative design methods and simulation and that can all qualify.”

One litmus test to conduct: “If the architect does not have financial risk for their work, then the costs associated with that project would not be eligible,” Quattlebaum says. Typically, a firm’s fixed-price or lump-sum contracts carry financial risk, he adds, but the terms of each contract must be analyzed to evaluate eligibility.

A bill proposed in Congress, the Furthering Our Recovery With American Research and Development (FORWARD) Act, would make R&D tax credits refundable. Because “many [architecture] firms generate credits that



The R&D tax credit helped LMN Architects offset design costs for the Seattle Aquarium’s Ocean Pavilion.

exceed their tax liability,” Quattlebaum says, “the proposed changes would result in additional cash savings for firms who invest in R&D.”

The uncertain economic outlook may give pause to designers considering the pursuit of new methods, tools, and strategies, but the R&D tax credit, as is, can offer a cushion and an incentive.

CarbonPositive: Pandemic, Injustice, and Climate Change

TEXT BY EDWARD MAZRIA, FAIA, AND NATASHA BALWIT

Both the COVID-19 pandemic and current worldwide protests against racial injustice reveal deeply entrenched social inequities that are far from new. Powerful responses to both crises acknowledge this truth and seek both short-term solutions as well as systemic change. When public attention subsides, the hard work will continue.

Underlying these injustices is the fact that fossil fuel emissions and climate change have a disproportionate impact on low-income and communities of color. With limited resources they must contend with climate hazards such as air pollution, which can cause increased rates of respiratory illness and vulnerability to disease; displacement from flooding, fires, and other natural disasters; migration because of drought, scarcity of clean water, and lack of food security; and heat waves and heat-related occupational illness. These impacts will only deepen and exacerbate current injustice if the root cause of climate change is not immediately addressed. Slowing and reversing the climate crisis requires a sustained focus and urgent commitment in the wake of the current pandemic: Once a threshold of global warming is crossed, climate change will continue to intensify and will be irreversible.

Recognizing that timing is critical and that the built environment is responsible for more than 70% of all CO₂ emissions, Architecture 2030, ARCHITECT, and their partners will host the CarbonPositive Reset! 1.5°C Global Teach-In. The UN Framework Convention on Climate

Global Teach-In Virtual Events

09.08.20
NORTH &
SOUTH AMERICA

09.17.20
EUROPE,
MIDDLE EAST
& AFRICA

09.22.20
ASIA, ASIA PACIFIC
& OCEANIA

Change (UNFCCC) sets the threshold for global temperature rise at 1.5°C above pre-industrial levels to avert an irreversible descent into climate chaos. We know the extent of change and work required to stay below this threshold: a 50% to 65% reduction of fossil fuel CO₂ emissions by 2030, and complete phase out by 2040.

There is no better time to set all sights on meeting this target and firmly commit to the immediate actions. The teach-in will bring together experts, practitioners, students, and policymakers from across the world. Together, we will focus on implementing the most effective and regionally specific architecture and planning strategies, materials, construction methods, tools, and policies to rapidly reduce carbon emissions in order to meet the Paris Climate Agreement target.

We remain in a critical race against time. On Feb. 20, 2007, Architecture 2030 hosted the first emergency global teach-in, the 2010 Imperative, which injected energy, practical knowledge,

and a sense of urgency into the climate change movement. It had more than 250,000 participants worldwide.

Teach-ins were pioneered by anti-war, racial justice, and labor activists generations ago, and the opportunity to leverage this format to again reach tens of thousands of our colleagues worldwide allows us to assess and reset our priorities and actions for the built environment—including providing practical solutions for the world's most vulnerable populations. Such a platform allows us to collaborate to carry out the real work of transformation: creating affordable clean energy and zero-carbon buildings and housing, designing walkable communities with free access to recreational areas, reframing our approach to buildings and infrastructure so that they act as carbon sinks, and supporting forest and biodiversity recovery.

The CarbonPositive Reset! 1.5°C Global Teach-In is scheduled as a full-day event that will be held three times in September, each one targeted to a different global region. Together, we can make the 1.5°C target a reality.



Vibrance



The upper two-thirds of this Technical Education Center is clad with Petersen's Highline S1 panel in three shades of red, gray and white, as specified by Pfluger Architects. The mix of finishes and profiles adds a high-tech appeal, with vibrant colors that pop and installation detailing that creates unique shadow effects.

Career & Technical Education Center, TX Installing contr.: Texas Roofing Co. Architect: Pfluger Architects
GC: American Constructors Owner: Del Valle Independent School Dist. Photo: alanblakely.com

Highline S1

Metal Wall Panel System

Cardinal Red, Ron Red, Tor Red,
Bone White, Cityscape



CASE STUDY @ PAC-CLAD.COM/DELVALLE

IL: 800 PAC CLAD MD: 800 344 1400 TX: 800 441 8661 GA: 800 272 4482 MN: 877 571 2025 AZ: 833 750 1935

PAC-CLAD.COM | INFO@PAC-CLAD.COM

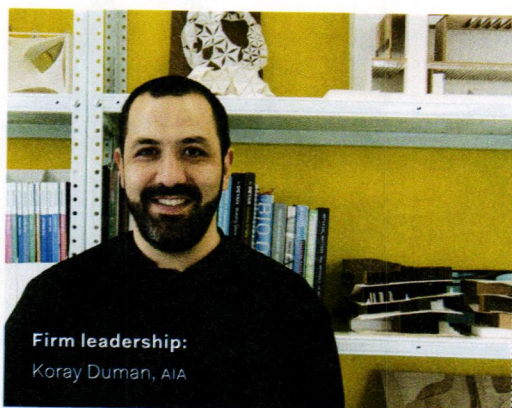
**Emerging professionals
are fueling today's design
conversation with high-energy
ideation that challenges
stated norms.**

Hanley Wood congratulates and thanks ASI Group for its ongoing commitment to design innovation driven by architecture's next generation.

Next Progressives: Büro Koray Duman

Location:
New York/Istanbul

Year founded:
2013



Firm leadership:
Koray Duman, AIA

Education:

Bachelor of Architecture, Middle Eastern Technical University in Turkey; Master of Architecture, UCLA

Experience:

Frederick Fisher and Partners in Los Angeles; Architecture In Formation in New York City

Firm size:

Four to six

Firm mission:

We believe in architecture's ability to be a social infrastructure. We want to design spaces that encourage people to interact with others and the space around them, and spaces that are meant for production of culture. Early on, we decided to move away from prescriptive and overwhelming design gestures.

Most important project:

The Islamic Cultural Center. We were able to get involved with the project from very early on. The research we did with the client and the multidisciplinary team was pivotal to think about what it means to create a cultural center for an underserved minority community, what it means to be an American Muslim now, and what kind of an institution should foster the new generation of American Muslims. It was the first time I realized how our profession too often shrinks to being merely a technical consultant and how we need to constantly push the boundaries of our profession to expand.

Second most important project:

Helsinki Hamam. This year marks the 30th anniversary of the Finnish Cultural Institute in New York. They want to expand their program beyond working with Finnish artists and designers. Turkey and Finland share several cultural rituals, including the Finnish sauna and the Turkish hammam. The idea was to create a temporary pavilion on water, looking at how people socialize around water in saunas and hammams. The project was scheduled for May 2020 and was unfortunately canceled due to COVID-19.

Biggest career leap:

Being shortlisted for a new addition to the Noguchi Museum in Long Island City. It was the first time our office was invited to a shortlisted competition for an institution. We won the project three

years ago and the construction is due to start in fall 2020.

Design tool of choice:

Blackwing matte pencil

Design aggravation:

Unnecessary twisting and turning of forms for the sake of formal play. If the gesture does not provide interesting spaces within or around, or opportunities for the users or public, do not bother.

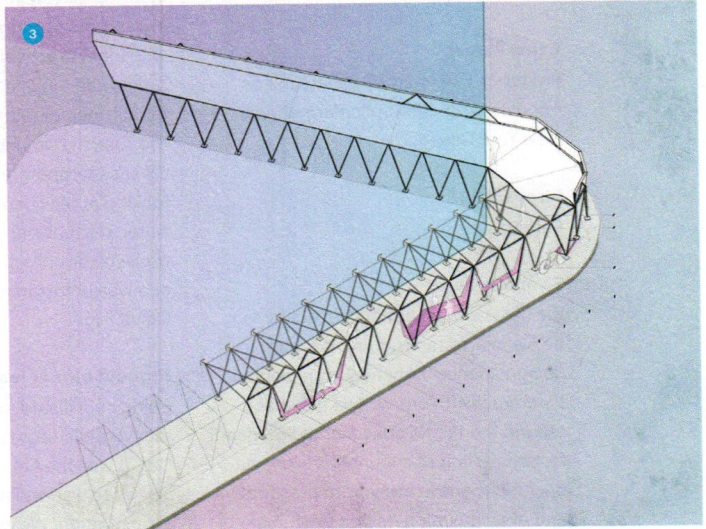
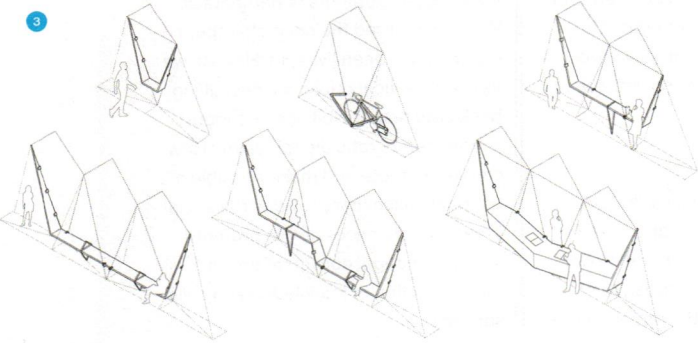
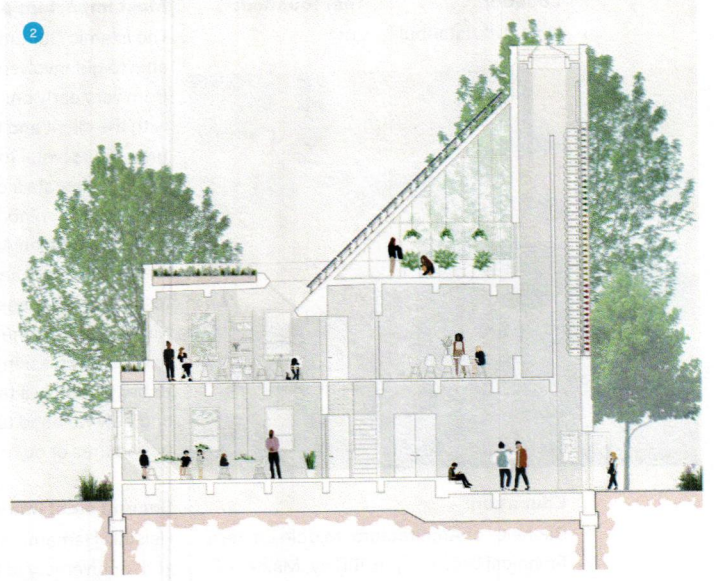
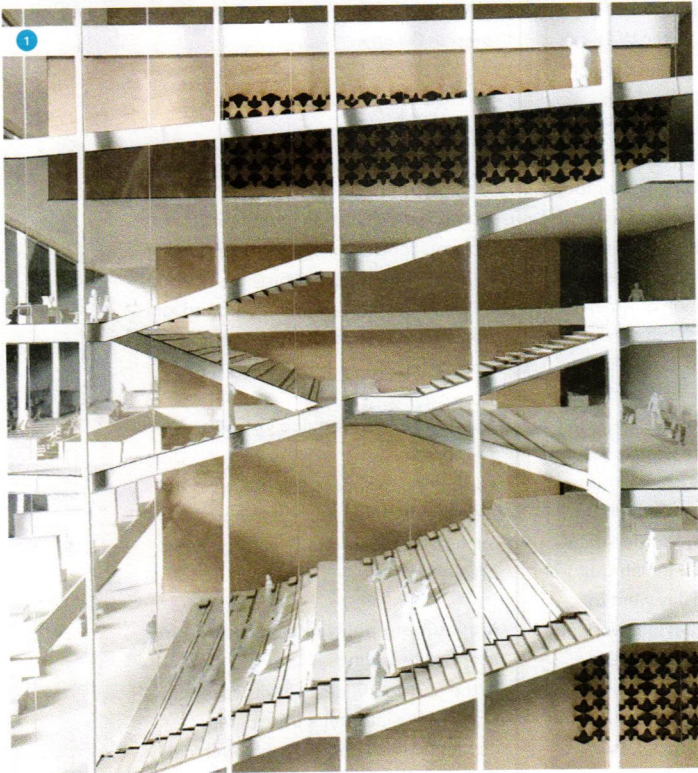
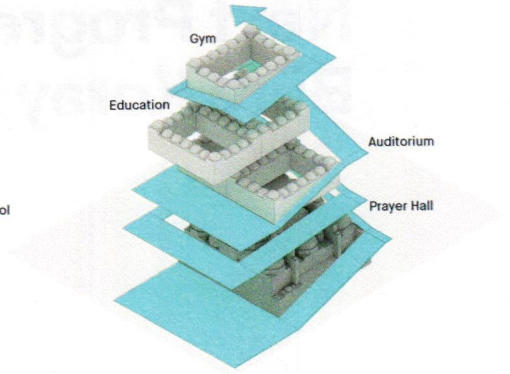
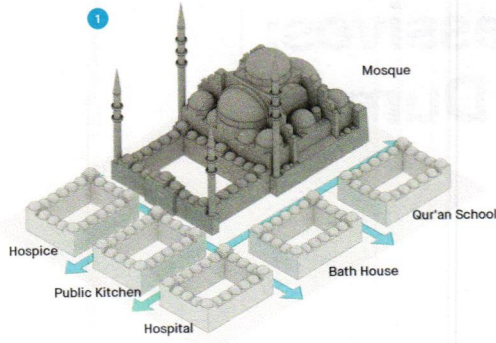
Most important advice you ever received:

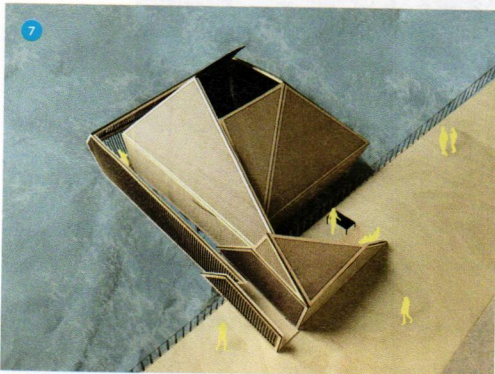
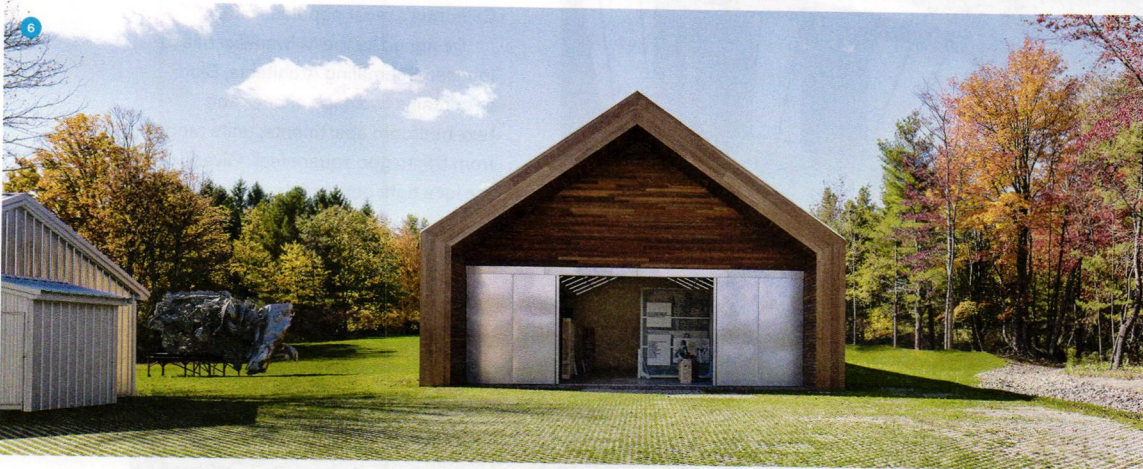
You can be the best cook in the world. It does not guarantee you to have a successful restaurant. That requires a great team.

Most urgent political question facing architects today:

In the past few years, we witnessed the limits of the internet's transparency: its horizontality and "non-hierarchical" and "non-mediated" structure, making it a threat to elements of democracy. We have realized the echo chambers that we have been living in. How do we foresee physical public spaces taking back civic responsibilities or support a more democratic digital realm? How can we promote and make possible a physical space that provides the social infrastructure necessary to promote social exchange, conversation, and the production of knowledge and civic spaces?

**Next Progressives:
Büro Koray Duman**





1. For the design of the Islamic Cultural Center in New York, bringing "architectural thinking to the table from the very beginning helped to form the identity and program of the institution, and the architecture became a natural extension of the research and debates we had," Duman says. 2. The LES Ecology Center engaged Büro Koray Duman to investigate how retrofitting the organization's historic New York building could make it more energy efficient through the use of geothermal, photovoltaic panels, and Tesla battery packs to store surplus energy. 3. Urban Canopy, a research initiative that seeks to reinvent scaffolding in New York City offers a kit of parts (benches, side tables, bike racks, food vendors) that can be incorporated into the ubiquitous construction framing. 4. The Publisher's Loft rethinks how an extensive book collection can be creatively accommodated in an apartment in Williamsburg, Brooklyn. 5. The Artists Studio is the conversion of a manufacturing building in Harlem into a studio and gallery for the artist Richard Prince. 6. The Artists Foundation is a gallery and art storage barn in upstate New York, constructed as part of a larger master plan for Prince's foundation. 7. The Helsinki Hamam aims to introduce New Yorkers to different ways of socializing around water. "We were able to define the question for the project with the client, rather than only providing a creative solution," Duman says.

Residential: Block 27, by Johnsen Schmalig Architects

TEXT BY MADELEINE D'ANGELO



In Sacramento's Newton Booth neighborhood, R Street is lined by a sea of single-family bungalows on one side, and light industrial buildings on the other. Block 27, a 4,505-square-foot, four-unit apartment complex, makes use of an infill lot right along that border, targeting a neglected segment of the market in one of California's most populous cities.

Designed by the Milwaukee-based Johnsen Schmalig Architects, Block 27 contains two each of one- and two-bedroom apartments; units range from 675 to 900 square feet. Given the lot's tight constraints, the building

Located on an infill lot in Sacramento's Newton Booth neighborhood, Block 27's four small units provide a mid-market housing alternative.

> For materials and sources information, visit bit.ly/JSABlock27.



Update your restroom to hygienic touch-free.

Now more than ever, making the commercial restroom experience touch-free is crucial to public health and safety. Sloan is ready to provide updates from manual to touch-free fixtures, with products for every budget.

Shown above: DSCT-8200 Designer Series™ Sink and EAF-100-ISM Optima® Faucet with ESD-1500 Sloan® Foam Soap Dispenser, EHD-501 Sloan® XLERATOR® Hand Dryer, ADA Recess Kit.

Shown left: G2 8186 Exposed Sensor Urinal Flushometer, G2 8111 Exposed Sensor Water Closet Flushometer.

Residential:
Johnsen Schmalig Architects

stretches upward, resulting in a three story height that begins to bridge the gap between the low-lying residential area to the south and the increasingly tall commercial centers to the north. "What intrigued us about the site was that weird dichotomy between these two typologies," says co-founding principal Sebastian Schmalig, AIA.

Clad in a simple palette of cedar and cementitious stucco, the building's façade grows increasingly transparent as it rises from a monolithic wooden base to a framed, open-air terrace on the third floor. "We carved out that third floor so the façade dematerializes and you see the sky through those openings instead of an enclosed volume," Schmalig says. "The intent here was to erode the volume as it rises up to the top, and reduce the visual weight that it has on the street."

An irregular pattern of floor-to-ceiling windows and vertical yellow stripes punctuates the upper two levels of the façade, and helps to distinguish the

multifamily building further from the stark industrial buildings nearby. "Some are just painted metal strips, and others are LED light strips that overlay the entire composition with their own order," Schmalig says.

Although Block 27's compact lot did not allow for a sprawling, grassy yard, the architects provided outdoor space with the building's shared, third-floor terrace. Instead of individual balconies, which would have been pocket-sized and difficult to position, this 680-square-foot communal space encourages interaction among residents.

The architects also wove sustainability into Block 27's common areas, electing to include bike storage in lieu of parking. The choice not only preserved the project's valuable square footage, the lack of parking also encourages residents to take advantage of more sustainable mass transit, including a nearby light rail line.

Block 27's design not only bridges the divides between building typologies and residents, it also works to help close the gaps in Sacramento's available housing by focusing on the often-ignored middle market. "There's a whole strand of the population that are making a decent living but get priced out of attractive housing options," Schmalig says. He hopes that Block 27—with its focus on design and amenities, balanced with its small unit size and resulting relatively lower price point—can help to provide "one piece of the puzzle" of housing inventory in the region.

Project Credits

Project: Block 27, Sacramento, Calif.

Client: Indie Capital

Architect/Landscape Architect/Lighting Designer: Johnsen Schmalig Architects, Milwaukee · Brian Johnsen, AIA, Sebastian Schmalig, AIA (principals-in-charge); Andrew Cesarz, P.J. Murrill, Ben Penlesky, Angelina Torbica, Matt Wendorf (project team)

Structural Engineer: Core 4 Engineering

MEP Engineer: LP Consulting Engineers

Civil Engineer: KPFF Consulting Engineers

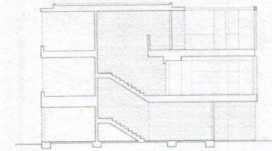
General Contractor: Indie Capital Constructors

Life Safety: Ultimate Fire Systems

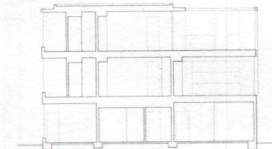
Size: 4,505 gross square feet; 680 square feet (communal roof terrace)

Cost: \$921,000

Section A-A₁



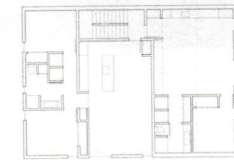
Section B-B₁



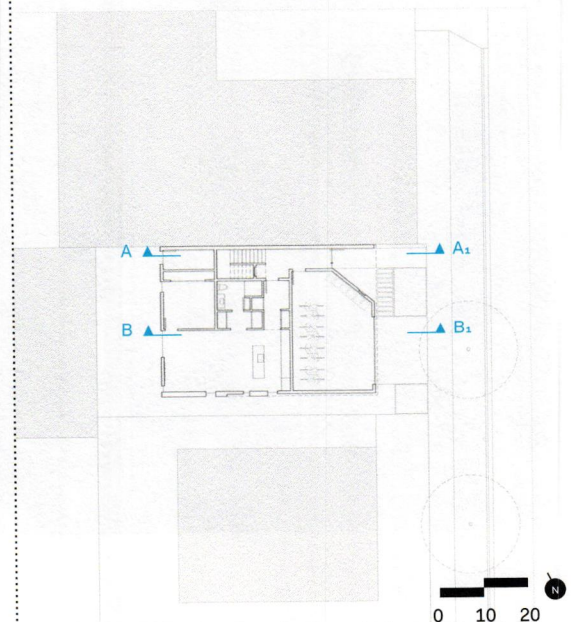
Third-Floor Plan



Second-Floor Plan



Ground-Floor Plan



THE MIRACLE OF 520 WEST 20TH STREET

The design specified 11-foot-tall glazing. The fire code said no way. Guess what happened next?

The view of New York City from this floating glass-and-steel aerie couldn't be more majestic.

In the distance reigns the Empire State Building and the fabled NYC skyline. Closer in, the growing architectural wonderland of Chelsea. Below, the strolling paradise of the High Line. Imagine this crazy-beautiful view being walled-over to meet fire code.

Welcome to 520 West 20th Street, the latest architectural pearl on a string of them along the High Line from Morris Adjmi Architects. The firm's portfolio of adaptive reuse projects reveals a sensitive hand at fusing historic integrity with contemporary design and materials. 520 West 20th Street is a classic example, essentially a stacked massing of new atop old in a beguiling vision.

FLOATING THREE-STORY ADDITION

The seemingly suspended new three-story steel addition is poised above an old 60,000-square-foot, four-story brick warehouse. The family-owned building is being reimaged as an 85,000-square-foot, seven-story mixed-use center, ideal for a corporate tenant.

"The historic integrity of the warehouse is preserved with the help of two new vertical cores that support the glass-and-steel addition," explains firm founder Morris Adjmi, FAIA. The cores work like "vertical masts to support the glass-and-steel box spanning between them." The new addition is cantilevered, creating the illusion of a floating office complex to High Line strollers.

TRANSPARENT FIREWALL

The upper tier features floor-to-ceiling glass panels. As obvious as that transparency seems, it didn't come without a knotty complication: The extreme proximity to neighboring buildings mandated two-hour-rated firewalls on the building's flanks. Spanning the new addition with an 11-foot-tall glass ribbon seemed like a dim possibility.

"We discovered there were apparently no manufacturers of two-hour-rated fire-resistant glass in the sizes we required," Adjmi says. "You could find smaller windows or create something with lots of mullions." In fact, the solution Adjmi's team had in mind would make 520 West 20th Street the nation's largest installation of fire-resistant glass.

UNEXPECTED SOLUTION

Emphasize the word "apparently." A California company came to the architect's attention from the project's chief glazing contractor. Contact was quickly made to Safti-First, North America's only vertically integrated, single-source manufacturer of fire-resistant glass, framing, and entrances for over 35 years. Yes, their ASTM E-119-rated, fire-resistant SuperLite II-XLB 120 system met the fire code requirement. What about the oversized dimensions?



Photo Credit: Morris Adjmi Architects

Actually, no ... they could go bigger. Lucas Posada, Adjmi's lead architect on the project, remembers the feeling well. "It was amazing. The windows are custom-designed to just what we needed." Having a maximum clear view area of 7,980 square inches with a maximum clear view height or width of 133 inches, SuperLite II-XLB 120 has the largest tested and listed sizes of any fire-resistant glazing product available today. The inclusion of low-iron glass in the fire-resistant glazing units also ensured superior clarity and aesthetic continuity with the adjacent non-rated windows.

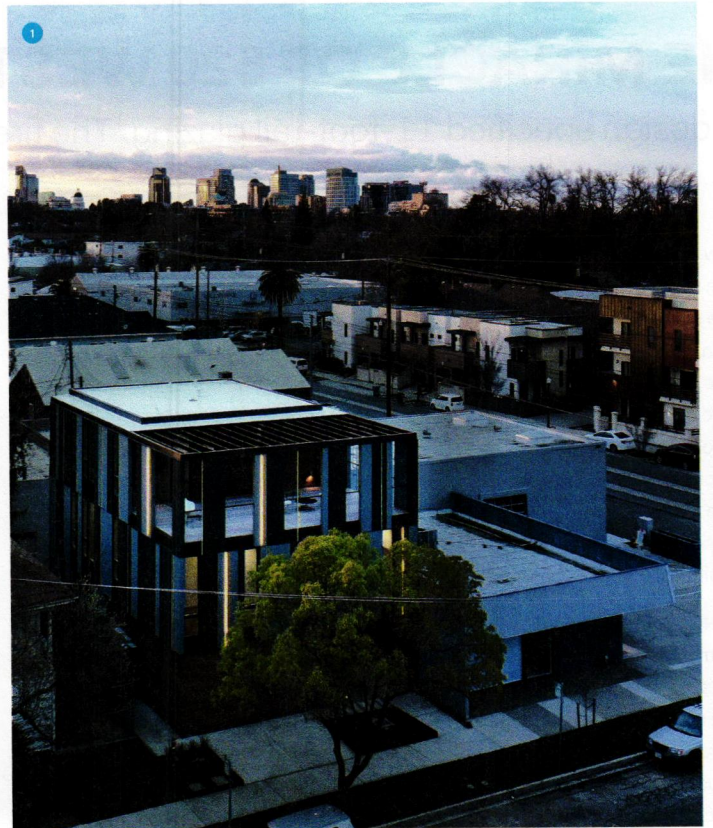
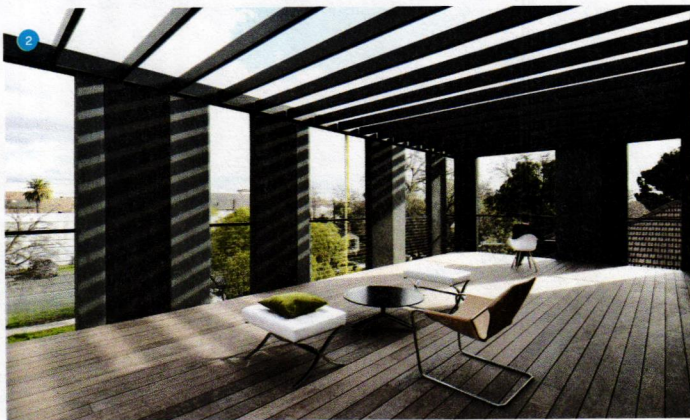
GOOD TO GO

There were no code issues, either. NYC code officials took one look at the third-party certifications from Safti-First and issued a quick approval. "There wasn't even a question," Posada recalls.

Like the acclaimed repurposing of the neighboring High Line, 520 West 20th Street is a stylish reminder of how fenestration science has helped transform the art of the possible in adaptive reuse.

To learn how advanced USA-made fire rated glazing systems, including jumbo-sized two-hour-rated fire-resistant glazing, could support your design, visit safti.com.

**Residential:
Johnsen Schmalig Architects**



- 1.** Painted yellow strips, some with embedded LED fixtures, create a dashed pattern over the Sto stucco and cedar façade.
- 2.** A third-floor, communal terrace offers residents a spacious outdoor area.
- 3.** Block 27 contains four units, each outfitted with Ikea and custom cabinets, Grohe kitchen fixtures, and Silestone countertops.

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.

5th ANNUAL



Call for entries

ELIGIBILITY

All full-time, part-time, and visiting faculty and administrators may submit studio course curricula, and the resulting student work, for consideration. All studio courses must have occurred in the context of an accredited Bachelor of Architecture or Master of Architecture program, or their equivalents, and all must have been concluded within the 2019–2020 academic year. Summer 2019 studios are also eligible. For full eligibility requirements, visit studioprize.com.

RECOGNITION

Winners will be featured in the November issue of ARCHITECT with expanded coverage online at architectmagazine.com.

HOW TO ENTER

SUBMIT YOUR WORK AT
> studioprize.com

DEADLINES

REGULAR September 2, 2020
LATE September 9, 2020

FEES

ADMINISTRATIVE FEE \$45
LATE FEE \$25 (for entries submitted after September 2)

Responsibility is the
watchword for architecture in
the 21st century and beyond.

Hanley Wood congratulates and thanks the National Ready
Mixed Concrete Association for its ongoing commitment to
sustainable design, material innovation, and social purpose.



A COALITION OF THE NATIONAL READY MIXED CONCRETE ASSOCIATION

hanleywood

Typology: Culver Steps, by Ehrlich Yanai Rhee Chaney Architects

TEXT BY KATIE GERFEN



The project's public space is anchored by a grand occupiable staircase made with Shaw & Sons concrete.

Culver City, Calif., has something that defies the car-centric tropes of the Los Angeles region: a healthy number of pedestrians. Encouraging this foot traffic, and further activating the streetscape, was a main driver behind the Culver Steps, a new mixed-use development at the heart of the city's downtown.

A public/private partnership between the city and developer Hackman Capital Partners, the Culver Steps features 35,000 square feet of new public space, complemented by 40,000 square feet of retail, and 75,000 of office. Designed

Project Credits

Project: Culver Steps, Culver City, Calif.
Client: The City of Culver City; Hackman Capital Partners
Design Architect: Ehrlich Yanai Rhee Chaney Architects, Culver City, Calif. · Steven Ehrlich, FAIA, Patricia Rhee, FAIA, Mathew Chaney, AIA (partners); Thomas Zahlten (principal); Bryn Garrett (associate); Alden Glauch, AIA (project architect); Lee Lamoreaux, Roy Malone, Yuan Feng, Andres Lin Shiu (designers)
Landscape Architect: SWA Group
Contractor: KPRS Construction Services
Structural Engineer: Saiful Bouquet Structural Engineers
MEP Engineer: Glumac
Civil Engineer: Psomas
Construction Manager: IDS Real Estate Group
General Contractor: KPRS Construction Services
Landscape Architect: SWA Group
Lighting Designer: BOLD
Parking Consultant: Walter P Moore
Signage: Air-Conditioned
Size: 115,108 square feet (40,000 retail, 75,000 office); 35,000 square feet (public space)
Cost: \$53 million

> To see more images of this project, visit bit.ly/CulverSteps.

Typology:
Ehrlich Yanai Rhee
Chaney Architects

by local firm Ehrlich Yanai Rhee Chaney Architects (EYRC), the project brings new life to what for years had been an empty lot. "It's an amazing site because you have the historic Culver hotel on one side, and on the other side, you have the Culver Studios. You're literally in the heart of downtown," says EYRC partner and project lead Patricia Rhee, FAIA. The plot served temporary uses, such as a Christmas tree lot in the winter or a staging area for outdoor events in the summer, but to have such a prominent piece of the sidewalk lie fallow was "just such a shame," she says.

The project's massing is broken down into a four-story office building with retail lining the base, a two-story restaurant volume, and the surrounding public space. "You don't have any back sides of the building," Rhee says. "Every façade needed to have that pedestrian scale break down—the ability to draw people in and that fineness of detail everywhere. It's always engaging, on whichever side you're walking by."

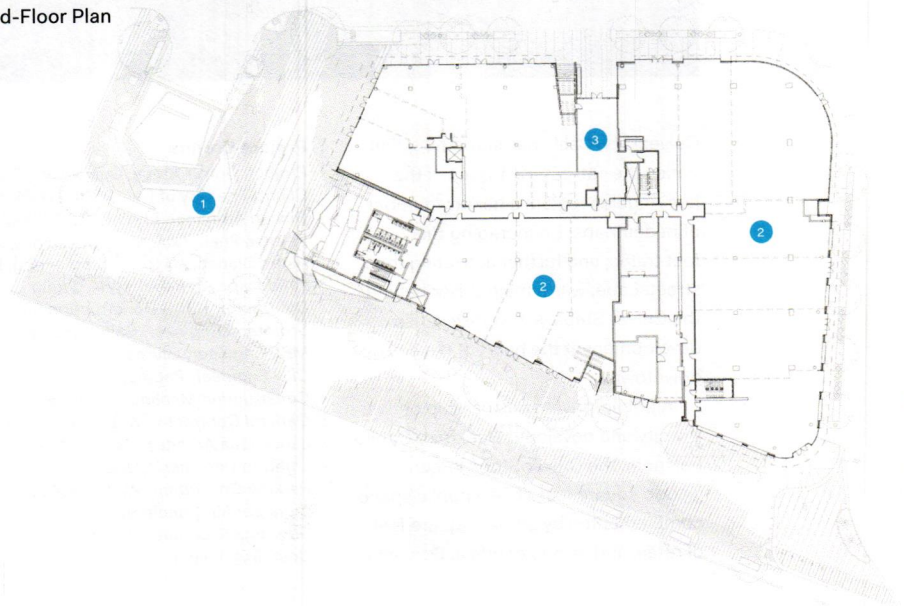
A bevy of glazing strategies help break it down further: floor-to-ceiling glazing for the restaurants and retail shaded by warm wood-lined overhangs that help prevent heat gain; fixed louvers on multi-story glazing facing east and west; and punched, operable windows that project from the easternmost corner of the project. All of the glazing is darkly tinted to help minimize heat gain, and, combined with a dark brick selected to make the project stand out from the red tones of the historic brick hotel,

"it makes an amazing backdrop for all the color that comes from the landscape, like the vines that grew up the wall," Rhee says.

Most of the interiors will be tenant improvement projects for Amazon, which leased the office space, or for retailers. But EYRC did design the bright and sculptural office lobby, cladding the walls and ceiling with alternating strips of light wood and lighting. "We went a little bonkers with the wood," Rhee says, noting that the goal was for the space to feel "like it was very carved out."



Ground-Floor Plan

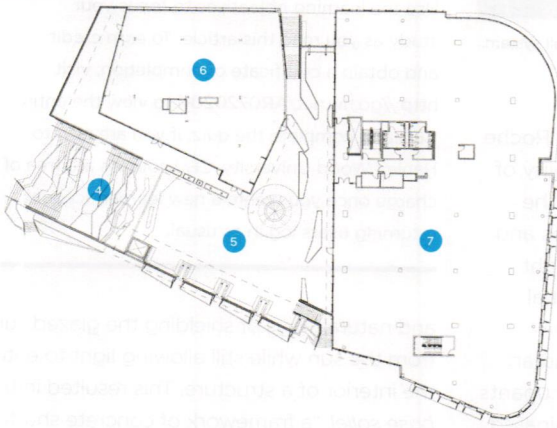


The project's ample public space runs throughout the complex, and was designed with the Los Angeles office of landscape architecture firm SWA Group. A plaza anchors the space to the west and south, and hosts green lawns, shade trees, seating, and paved areas with integrated strips of grass that help mitigate the heat island effect. But the main event is a nearly 50-foot-wide, two-story-tall monumental stair at the southern edge of the complex: With integrated lighting, plantings, shade trees, and seating, the stair can serve as everything from an outdoor gym to seating for a concert. The staircase leads to a second, raised plaza, and further gardens on the podium; while these spaces can be cordoned off for private events, they were designed to be accessible to any of the pedestrian traffic in the area.

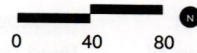
The complex opened at the end of 2019, and with tenants still moving in, did not reach full vibrancy before COVID-19 shut offices and retail across the country. But "now that we have bean bags and umbrellas out, people have little picnics out there—they're with hanging out with their kids and their dogs," Rhee says. "It's really for everyone."



Upper-Plaza Plan



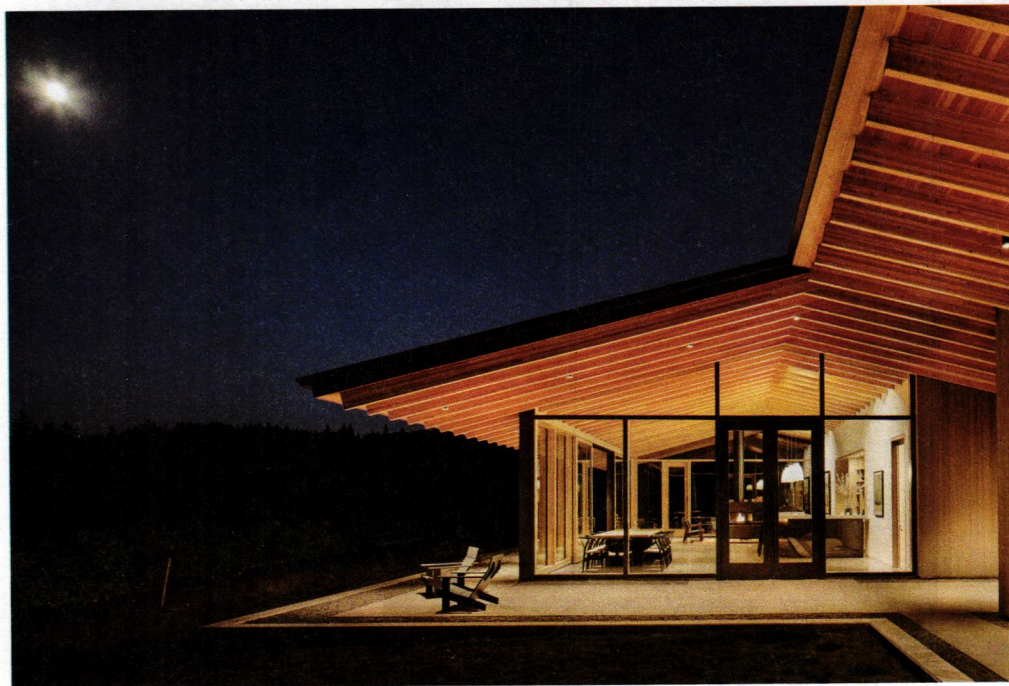
- 1. Plaza
- 2. Retail
- 3. Office lobby
- 4. Monumental stair
- 5. Upper plaza
- 6. Restaurant
- 7. Office



1. The easternmost corner of the complex has punched window openings in the façade formed from H.C. Muddox brick. 2. Tinted glazing from with tinted glazing from Guardian Glass combined with fixed louvers on this west façade help mitigate heat gain to the offices within. 3. The upper level plaza features fixed planters and pavers from Acker-Stone and StepStone. 4. The office lobby is clad in wood from gWood.

Wood Window Walls Achieve Biophilic, Sustainable Design in Contemporary Architecture

Presented By:



L'Angolo Estate Winery. The use of wood throughout this beautiful tasting room is enhanced with a timber curtain wall system. Photographer | Jeremy Bittermann | LEVER Architecture

AN INTRODUCTION TO HISTORIC EXPERIMENTATIONS WITH WINDOW WALLS IN MODERN ARCHITECTURE: LE CORBUSIER AND PHILIP JOHNSON

As the modern movement began in the 1920s, there were two primary responses to the potential architectural uses for large sheets of glass, which were a new innovation in glazing: letting in light and dematerializing architecture. The first school of thought was championed by Le Corbusier. By using reinforced concrete, Le Corbusier did not need framing walls and could instead install wall-to-wall windows. He ultimately wanted to “treat the interior like an exterior, creating effects of light and shade, volume and space.”¹

Villa La Roche serves as an example of one of Le Corbusier’s most auspicious

structures.² The window wall in Villa La Roche succeeded in “bringing an external quality of light into the interior and emphasizing the continuity between the external facades and the internal walls.”³ The windows and light also helped Le Corbusier to create spatial volumes and a “spatial experience”; the house functioned as both residence and art gallery, where a promenade guides occupants and visitors through “wonderfully illuminated spaces which were perceptibly designed to be experiential and viewed from a single, fixed point.” The central vestibule, where the window wall appears ultimately diffuses light throughout the interior of the Villa La Roche.⁴

To hone his techniques, Le Corbusier began to experiment with glass walls, including different glazing systems, ventilation, insulation,

LEARNING OBJECTIVES

1. Understand the importance of fenestration in contemporary and modern mountain architecture and how fenestration is used in these buildings for daylighting, views, and a connection to the landscape.
2. Examine the concepts of biophilic and sustainable design and why wood windows, doors, and curtain walls should be used to achieve these design goals.
3. Identify wood fenestration products that can be used to create walls of windows in both residential and commercial projects.
4. Explore design considerations, as well as glazing options that are imperative for occupant safety and comfort when designing with large expanses of glass.

CONTINUING EDUCATION

AIA CREDIT: 1 LU/HSW

Use the learning objectives to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit <http://go.hw.net/AR072020-1> to view the entire CEU and complete the quiz. If you are new to Hanley Wood University, CEU courses are free of charge once you create a new learner account; returning users log in as usual.

AIA
Continuing
Education
Provider

and natural ways of shielding the glazed surface from the sun while still allowing light to enter the interior of a structure. This resulted in the *brise soleil*, “a framework of concrete shutters placed in front of the window wall.” Another “natural” solution he devised was one “to replace mechanical ventilation.” He created an open section “designed to encourage a free flow of air through the building.” Some of Le Corbusier’s experiments were more successful than others. For the Le Corbusier projects that were not as successful, such as his Salvation

Army hostel, it became clear that it was not enough to simply let large quantities of light into a structure. He continued to experiment with thermal insulation, ventilation, and balancing the sometimes opposing needs of transparency and privacy.

Phillip Johnson: The Glass House

Phillip Johnson's Glass House was completed in 1949 and served as his personal residence from that date until 2005. Floor-to-ceiling plate glass exterior walls—on all four sides—are “held in place by steel stops and black-painted steel piers of stock H-beams.”⁵ Some of the panes of glazing are as large as 18' x 7'10”.

The house “ushered the International Style into residential American architecture.” During a walking tour with Johnson in 1991, he noted the house, stylistically, “is a mixture of Mies van der Rohe, Malevich, the Parthenon, the English garden, the whole Romantic

Movement, the asymmetry of the 19th century. In other words, all these things are mixed up in it but basically it is the last of the modern, in the sense of the historic way we treat modern architecture today, the simple cube.”⁶

Before being inspired by any style, however, Johnson was moved by the land. Stating he had ““thrown out”” a multitude of ideas for the house for several years, it was not until he discovered a knoll in the woods that he began to conceive of the ultimate design for the house. In short, the design was ““conditioned by the landscape,”” and ““the view from the knoll and the view back was how [Johnson] figured the whole thing.”” The house is situated against the knoll with a pavilion at the end, affording views in all directions.⁷

While the house cannot be seen from the road, achieving privacy without destroying the aesthetic was a concern. The solution was the result of discussion and planning between

Johnson and Van der Rohe. A separate, circular pavilion in the center of the house contains the bathroom, and the house as a whole is arranged asymmetrically as blocks and planes. Johnson then encapsulated the interior design in a ““symmetrical cage”” which he found to exude an exterior calmness and sense of organization. The entire Glass House sits on a step, resting on a lawn ““delineated by a granite edging [that] anchors”” the house to the land.⁸

Ultimately, however, the Glass House afforded little privacy, and while Johnson made the property his weekend home, he also built another 14 structures on it, dividing his time between the Brick House, where he slept; the Library, where he worked; and Calluna Farms and Grainger, where he relaxed.⁹ In short, while the floor-to-ceiling windows across all four exterior “walls” at the Glass House afforded unrivaled views of the surrounding landscape, they did not offer enough privacy to make the house fully functional.

GLOSSARY

Biophilia—was coined by German social psychologist Erich Fromm in 1964 and further developed by Edward O. Wilson in 1984 in his work, *Biophilia*. The term itself can literally be translated as a “love of life” or of living things, and Wilson maintains that people have an “innate tendency to focus on living things, as opposed to the inanimate”; “long-term sustainability of restoring and strengthening the relationship between man and nature.”

Brise Soliel—“a framework of concrete shutters placed in front of the window wall.”

Contemporary Design—started to become popular around the 1970s; incorporates elements of any style, including modernism, postmodernism, art deco, deconstructivism, and futurism; literally means “of the moment” and is constantly evolving and incorporating new and old trends, as well as design principles and elements.

Daylighting—natural light is incorporated into a space; desirable from both a health and an energy-savings perspective; adds to visibility; can help to regulate circadian rhythm as well as body systems and moods. With the right fenestration systems, daylighting can further increase ventilation and contribute to energy savings.

Indoor Environmental Quality (IEQ)—encompassing “the conditions inside a building—air quality, lighting, thermal conditions, ergonomics—and their effects on occupants or residents.”

Low Emissivity (Low-E)—comprised of several layers applied to glass; heat is filtered out while visible light can filter in. The layers, or coatings most

commonly in the form of metal oxides, are applied to glass during production and help reduce radiant heat transfer. Such coatings help to lower a window's U-factor and can protect furnishings from fading while providing benefits to the wellbeing of occupants.

Modern Design—trends began in the late 1800s, are rooted in the German Bauhaus school of design, and have taken cues from Scandinavian emphasis on simplicity and function; eventually gave birth to mid-century modern in the 1950s and 60s and then to postmodernism in the 1970s and 80s.

Mountain Modern—does away with clutter and heavy décor, rejecting the 20th century stereotype of dark log cabins filled with hunting motifs, heavy textures, and dark colors. Instead, modern mountain architecture strives for unique exteriors; windows and light; subtle texture over dark color; locally sourced materials; indoor/outdoor living; and low maintenance designs.

Solar Heat Gain Coefficient (SHGC)—the measurement of the solar heat that passes through glass from sunlight. This measurement is expressed as a number between 0 and 1. A value of 1 indicates that all solar heat passes through, and a value of 0 indicates that no solar heat passes through.

Vertical Timber Architectural Wall Systems—give specifiers the design freedom and load bearing capabilities to meet current commercial and residential trends including expansive use of glass, clean straight lines, and transparency between indoor and outdoor living.

CHARACTERISTICS OF MODERN AND CONTEMPORARY ARCHITECTURE¹⁰

Today's architecture and design encompass a broad range of styles from numerous influences. What is currently considered "contemporary design" started to become popular around the 1970s. It incorporates elements of any style, including modernism, postmodernism, art deco, deconstructivism, and futurism. Contemporary design, which literally means "of the moment," is constantly evolving and incorporating new and old trends, as well as design principles and elements.

One of the most influential trends that contemporary design incorporates is modernism. Modern design trends began in the late 1800s, are rooted in the German Bauhaus school of design, and have taken cues from Scandinavian emphasis on simplicity and function. Modern design trends eventually gave birth to mid-century modern in the 1950s and 60s and then to postmodernism in the 1970s and 80s.

While modernist adaptations of the principles and elements of design are still currently in use, there are some differences between modern and contemporary interpretations. Because contemporary design is constantly growing and changing, it involves components of modern design as well as components beyond modern

design's scope. For instance, modern design uses pops of color or dark colors eliminating coldness, whereas contemporary design might either use pops of color or encompass minimalist trends and intentionally create starkness. Modernist design also focuses on functionality; however, contemporary design has the tendency to focus on form. Additionally, modern design emphasizes vertical and horizontal lines whereas contemporary design includes curved shapes, as well as horizontal and vertical lines.

Contemporary architecture also uses the latest technology and materials, veering away from the architecture of the late twentieth century by including eco-friendly features and embracing sustainability. Building design has become focused on energy efficiency and the use of appropriate materials. Walls of windows or glass for natural lighting and ventilation are common, allowing occupants to interact more seamlessly with the natural environment, as well as improving heating and air conditioning costs.

Both contemporary and modern design, however, embrace a straightforward use of building materials and structural systems, and design facilitates the integration of interior and exterior environments. A general lack of ornamentation encourages a focus on materials such as glass, steel, wood, or stone,

or on asymmetrical compositions, to provide aesthetic interest. Both styles incorporate clean lines and uncluttered spaces with the goal of making rooms comfortable and inviting.

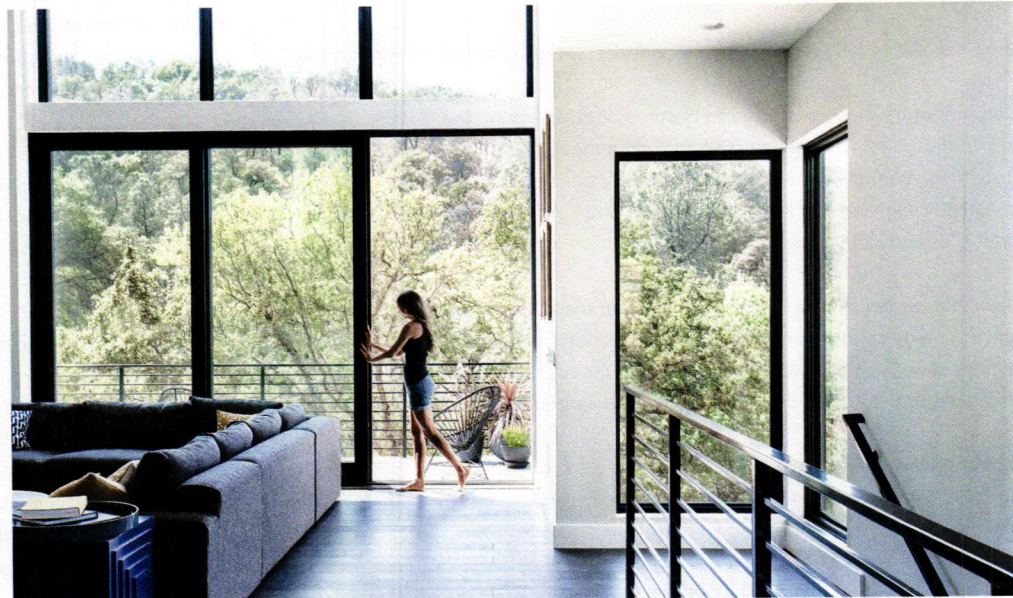
Characteristics of Mountain Modern Architecture

Mountain modern architecture also does away with clutter and heavy décor, rejecting the 20th century stereotype of dark log cabins filled with hunting motifs, heavy textures, and dark colors. Instead, modern mountain architecture strives for unique exteriors; windows and light; subtle texture over dark color; locally sourced materials; indoor/outdoor living; and low maintenance designs. Technological advances have created new opportunities for mountain design that embrace the outdoors while still providing warmth, comfort, and security.¹¹

One of the most important features of a mountain modern home is its use of windows. An article on design trends in Mountain Living notes, "Contemporary mountain forms reach up and out, to bring the outdoors in, as opposed to the sheltering, enclosing shapes of traditional mountain designs." While older technologies and building techniques sought to protect inhabitants from harsh mountainous climates by creating dark, cave-like dwellings, newer technologies and



Daylighting in abundance comes through these floor to ceiling contemporary windows. *Photographer | Farmer Payne Architects*




Open an entire wall to the outdoors, and create a seamless transition to nature.

techniques permit the use of floor-to-ceiling windows that simultaneously let in light and protect occupants. These window walls are comprised of operable glass, blurring the boundaries between exterior and interior and allowing occupants to get the most of views through indoor/outdoor living.¹²

Not only does indoor/outdoor living afford better integration with the surrounding landscape, it also increases the total living space of a home. This means both the incorporation of retractable windows into design but also large decks and ski-in, ski-out basements. Native landscaping further contributes to the feeling of being at one with the outdoors and escaping to the mountains.

Open layouts and tall ceilings further contribute to views, brightness, and a connection with the outdoors. They also emphasize larger design features like building materials rather than smaller, cluttered decorative items. Glass, stone, concrete, and thick woodwork create varied interior textures and focal points while connecting to the exterior landscape. Many of these materials are locally sourced or reclaimed, contributing to sustainability efforts while offering the added benefit of amalgamating with natural surroundings.

 This article continues on

<http://go.hw.net/AR072020-1>.

Go online to read the rest of the CEU course, complete the corresponding quiz for credit, and receive your certificate of completion.

SPONSOR INFORMATION



Sierra Pacific Windows makes an extraordinary range of windows and doors for residential and commercial applications, including new construction, replacement, coastal, and innovations in load-bearing Timber Curtain Wall Systems and specialty door technology.

From planted seed to delivered window and door, we control every part of our vertically integrated approach. Visit our website at:

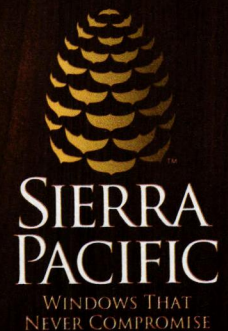
www.sierrapacificwindows.com

QUIZ

- Phillip Johnson's Glass House was completed in _____.
 - 1926
 - 1949
 - 1955
 - 1960
- According to the course, which design trend began in the late 1800s and is rooted in the Bauhaus school of design?
 - Contemporary Design
 - Futurism
 - Modern Design
 - Deconstructivism
- Which design trend started to become popular around the 1970s?
 - Contemporary Design
 - Futurism
 - Modern Design
 - Deconstructivism
- Mountain Modern Architecture can best be described by which of the following?
 - Hunting motifs
 - Heavy textures and dark colors
 - Log cabins and heavy décor
 - Subtle texture, locally sourced materials, low maintenance design, and windows and light
- Biophilic design offers which of the following benefits?
 - Improved mental health and reduced stress
 - Attention restoration and increased wellbeing
 - Decreased violence and crime and greater altruistic behavior
 - All of the above
- Wood is better for the environment in terms of greenhouse gas emissions, air and water pollution, and other impacts. Steel and concrete consume 12% and 20% more energy, emit 15% and 29% more greenhouse gases, and release 10% and 12% more pollutants into the air, and generate _____ and 225% more water pollutants than wood, respectively.
 - 100%
 - 200%
 - 300%
 - 400%
- This type of window can be described as a specialty window designed to take contemporary aesthetics to any level, turning walls into moving focal points. It folds effortlessly to the side, creating an expansive opening that is ideal for a pass through to an outdoor living space.
 - Casement
 - Bi-fold
 - Multi-slide
 - Awning
- This type of window can be described as being able to slide in one or both directions. They can stack on the sides, or even slide completely into a pocket in the wall. They can also turn a 90-degree corner into an opening.
 - Casement
 - Bi-fold
 - Multi-slide
 - Awning
- Which option listed below is comprised of several layers applied to glass, filtering heat out and letting light filter in?
 - Low-E
 - Gas-filled airspaces
 - Non-metal warm-edge spacers
 - None of the above
- The WBDG maintains that low SHGC windows should be specified on which façade of large commercial and industrial structures?
 - South
 - East
 - West
 - All of the above

Construction and design practices that protect the environment are more than a good idea, they're becoming an essential part of doing business. But when it comes to building in a way that truly respects and preserves our limited resources, it's only part of the story.

BUILDING VALUES THAT GO BEYOND SUSTAINABILITY



SierraPacificWindows.com | 800-824-7744 A Division of



Sustainable vertical integration, our

unique seed-to-window manufacturing approach. Owning every step of the manufacturing process gives us something no other window company has — complete control of everything from product quality to how we practice environmental stewardship. We're the only window and door company that builds this way, and it affects everything about us as a company, starting with where we get our wood.

The benefits of being your own supplier. We buy wood from ourselves. Our parent company owns over two million acres of prime forestland, maintained with strict adherence to the environmental protection standards of the Sustainable Forestry Initiative® (SFI). As a result, we'll plant 7 million new trees this year, and schedule frequent visits from our professional foresters and wildlife biologists to help protect wildlife habitat. For generations, we've been growing more than we harvest, to make us more than sustainable. Much more.



Every step of the process helps us do more. The vertical integration manufacturing cycle that produces our world-class windows and doors gives us more ways to protect resources too. We process the wood, convert the lumber, assemble the components, and ship the products. The bark and sawdust left over? It fuels seven cogeneration energy plants that produce energy for our local communities. This approach makes us different. It makes us better at protecting quality, our people, our communities and our environment.

Windows and doors greater than the sum of their parts. Building products this way is an expression of what we value as a company, one that will have lasting effects for generations to come. Increased forest growth reduces greenhouse gasses through carbon sequestration. Vertical integration helps us respect our limited resources. Our goal is to work with you to become part of something bigger than ourselves. And on this point, we will never compromise.



Watch our values come to life at sierrapacificwindows.com/videos





AIA Architect

AIA Q&A

Planning for Multiple Scenarios

Q&A with Sheela Søgaard and Kai-Uwe Bergmann, FAIA

A strong network can be an asset in challenging times.

Bjarke Ingels Group has grown to four offices and more than 600 employees in the last 15 years, which is a huge undertaking even under the best economic circumstances. Here, BIG partner Kai-Uwe Bergmann, FAIA, and CEO Sheela Maini Søgaard talk about what the current public health crisis means for a creative and business enterprise, and the value of creating a support network for designers and architects who have moved through the firm over the years. “We have a saying at BIG,” Bergmann says: “Once a BIGster, always a BIGster.”

As told to William Richards

Søgaard: The uncertainties that affect global markets also affect our clients, and therefore us, and the need to plan for several scenarios is stronger now than ever. We are learning a new way of working not only with each other, but also with our clients and external collaborators.

Perhaps the learnings accumulated now will reduce our need for frequent travel in the future. We are learning new styles of management that depend on the ability to

disperse assignments efficiently across team members and rely on their deliverables without as much supervision or guidance as normal. We are approaching this situation as an opportunity for growth of our leadership and BIGsters alike.

Bergmann: Google is one of our current clients, and we have already been integrating a lot of their digital tools for remote working and conferencing over the past years, so our staff is very adept at this already. As such, we have maintained our productivity in these challenging times. At BIG, we are currently sharing conceptual PDFs within our design teams and learning how to interact and sketch within a group of 5-10 designers, one on top of another, to further the design interactively. I feel that this will quickly be adopted into the studio environment if it has not already.

Søgaard: In many regions, the immediate future is somewhat less predictable than usual, and that has increased our tolerance for risk in the short term. As an employer we are doing our best to ensure that we inform our BIGsters transparently about market and business developments, how BIG is affected, and how this may in turn affect them in the short and medium term.

Bergmann: BIG was founded 15 years ago and we currently number more than 600 BIGsters in our four offices around the globe. [This number is] complemented by the 1,000 or more BIGsters who have left BIG for new horizons—returning to school to finish their studies, or starting their own offices. Over the years we have mentored many of these entrepreneurial spirits as they started their own design practices, visualization studios, or, in some cases, their own restaurants. We see former employees as our family, and provide a helping hand when we can through our “Big Resources for Small Businesses” network, so that in these challenging times, they all can fall back upon our incredible network and ask their most pressing questions to see if anyone else may have dealt with a similar issue. We can allow our collective experience to provide a helping hand.

Søgaard: We acknowledge that 2020 will be a year marked by risk and less growth than in recent years. Whenever the immediate future is unpredictable, it is natural to experience some concern—and rightly so. Focus on those things you can control. Plan the possible scenarios and remedies for each, as well as which triggers will alert you to the development of one scenario over others. Plan. Evaluate. Act. Re-evaluate. **AIA**

AIA Contract Documents

Real projects start with the industry standard

Throughout design and construction, Bell Architecture used an AIA contract to construct the **Mandeville Residence**, influenced by estate homes in France.

AIA documents used: B101-Owner/Architect Agreement

Learn more about the Mandeville project at aiacontracts.org/architectmag-mandeville



 **AIA** Document B101
Standard Form of Agreement Between Architect and Owner

AGREEMENT made as of the _____ day of _____
in the year _____
(In words, indicate day, month and year.)

BETWEEN the Architect's client identified as the Owner
(Name, legal status, address and other information)

AIA Now

AIA Future



Buster Ward sits outside his West Alabama home, which was designed and financed as part of Rural Studio's Front Porch Initiative.

Holistic Solutions for Homeownership

The work of Rural Studio's Front Porch Initiative doesn't stop at design.

By Katherine Flynn

Since its founding almost three decades ago, Auburn University's Rural Studio has focused on affordable housing as a core part of its mission to serve the residents of Hale County, Ala. This commitment was formalized through

the Front Porch Initiative, an offshoot of Rural Studio that aims to build single-family houses and enhance access to mortgages in high-need rural areas. Each house design prioritizes the objectives of affordability, energy efficiency, and resilience.

Beyond design, the Front Porch Initiative tackles the accumulated costs of owning a home, including building operations, maintenance, and insurance. "When you think about housing affordability, you think about what a house costs to build," says Rusty Smith, associate director of Rural Studio and a faculty member at Auburn University's College of Architecture, Design and Construction. "But we've found that thinking about the

total cost of homeownership is where the most traction can be made." Through work with partner Fannie Mae, which extended a research agreement with Rural Studio for three additional years in April 2020, faculty and students developed four prototypes for one- and two-bedroom houses that can be adapted to different site conditions. The detailed construction documents and supporting technical materials allow the houses to be built by local workforces with easy-to-access materials.

Over the next year, the Front Porch Initiative plans to further refine prototype designs and start construction on houses in Tennessee, Florida, and South Carolina. **AIA**

AIA Feature

wo/AIA

Rebuilding Trust

Community-led design seeks to dispel myths about who best understands how to shape public space.

By Patrick Sisson



For Chicago-based architect and designer Craig Stevenson, it's always been vital to work with, not for, the community.

Stevenson is director of the Chicago's chapter of the Open Architecture Collaborative (OAC)—a national nonprofit that does pro bono work designing buildings and placemaking projects for local communities. The realities of working in the midst of the coronavirus pandemic, and the recent wave of protests over police brutality and the death of George Floyd, have made outreach and community engagement even more essential tools for facing an “existential crisis.”

“It’s an interesting challenge to design when fear and grief is prevalent,” he says.

Stevenson is part of a team working on Under the Grid, a kind of reverse High Line for the North Lawndale neighborhood in Chicago that aims to turn vacant lots underneath rail lines—specifically a stretch of the Pink Line of the city’s elevated train system—into a park, community green space, and gathering place. The ongoing project seeks to spark interest and re-emergence in art and the business corridor—a place for farmers markets, basketball, and dance events, created in concert with community groups, local businesses, and residents. To do so, the group has been holding hackathons and meetings with community groups as part of OAC’s goal to democratize design, flatten hierarchies, and dispel myths about just who understands how to shape public space and how it can best serve a community.

“We’re not here to impose solutions on people,” he says. “It’s about figuring out how the community wants to solve the immediate need for public space, and the best solutions to bring people together.”

A New Challenge

In coming years, architects will be challenged like never before to help disadvantaged communities rebuild after these crises. Neighborhoods across the nation have been irrevocably changed by coronavirus and protests, both of which have altered perceptions of public space.

Listening, responding, and shaping future designs around neighborhood needs will become even more vital. And while some might see the time and effort involved in garnering feedback and engaging in community-led design as a luxury, that would be a mistake, according to architects and designers who place equity, community feedback, and social justice at the center of their practice. When resources are scarce, the value of truly reflecting the community in design, hearing about their struggles and trauma, and getting their buy-in is immeasurable.

“Architecture often sets itself up to be an expendable service, a luxury,” says Liz Ogbu, a designer, urbanist, and social innovator who teaches at the University of California, Berkeley. “We should do work that’s vital to people’s day-to-day ability to live their life. During the last recession, I worked for a small nonprofit, and while there was a culling of the industry—a third lost their jobs—I never feared, because the work we were doing was essential. Community-based work is about creating tools that let people thrive and live their best stories. That’s what success looks like to me.”

It’s a priority that the profession as a whole is being increasingly challenged to meet. “Democratizing the decision-making and

design of the built environment is critical to both the future relevance of our profession and a truly equitable society,” says William Bates, FAIA, 2019 president of AIA.

It’s instructive to look at the Great Recession of 2008, and the birth of placemaking, as architects adjust to new financial realities, Ogbu says. With city budgets on hold back then, the DIY/guerrilla approach created an opening for smaller street-level projects. In the coming years, communities recovering from historic disinvestment, a pandemic, and the loss of so many small businesses will look to the kind of rapid response design, such as parklets and pop-ups, that flourished in the early 2010s.

This approach also offers quick ways to help neighborhoods recover. Coronavirus has exposed long-standing social inequities, says Sara Aye, executive director of Greater Good Studio, a Chicago-based social design practice. People of color and low-income people, who were already marginalized, have been further marginalized in the management and containment of the outbreak. Any project purporting to help needs to first engage with these uncomfortable truths.

“If you design something for a group of people, but not with them, you’re not doing it for them, you’re imposing upon them,” Aye says. “You’re assuming the role of a savior, that your expertise outweighs their lived experience. These assumptions aren’t just dangerous, they add up to irreparable harm.”

For Aye, whose specialty—like a recent multi-city collaboration with the Robert Wood Johnson Foundation to help local groups design children’s health programs—is process, what’s required now goes beyond the typical methods

AIA Feature

CONTINUED

of listening and outreach. Design teams can't rely on the traditional engagement checklist and community meetings, which typically exclude those who can't take time off or obtain childcare, and often favor louder, more organized, and more white voices (Katherine Einstein, a Boston University professor and researcher, has analyzed who speaks at public meetings and found a significant racial divide and underrepresentation of people of color).

Language is key to engagement, Aye says. Don't ask about problems someone faces, projections of the future, or the needs or dreams of a community at a time when compounding crises make that sound slightly tone deaf. Start with questions that honor the moment and ground feedback in lived reality, with inquiries about daily activities, fears, attitudes, and small improvements.

As fears of coronavirus make some of the preferred methods of in-person outreach—listening sessions, setting up pop-up booths at fairs and public events, door-to-door surveys, and small group meetings—impossible, digital means have become more prevalent. That's created fear of a digital divide, says Katherine Darnstadt, AIA, architect and founder of Chicago's Latent Design. But it's not so simple. Done right, digital meetings can actually encourage more interaction, and they can be recorded and remain online well beyond the live event, inviting more feedback from those who can't attend.

"Establishing a digital footprint doesn't solve every access issue, but it can make it easier for a larger number of people to connect," Darnstadt says. "But more doesn't always mean better. Policymakers need to change the status quo of how they intake and utilize feedback."

Seizing the Moment

As cities and neighborhoods begin to reopen, rapid prototypes and small-scale projects for commercial districts will be a focus due to changing regulations, the growing needs of local businesses, and evolving health guidelines. Darnstadt believes architects need to seize the moment and advocate not just good design, but for reforming processes and cutting costs that further benefit the community. How can policies be nudged in a direction that allows for quicker deployment of car-free streets, outdoor dining areas, public space, or pick-up and drop-off zones? Can designers reappropriate common items, such as sawhorses or other materials used by municipal authorities, for other purposes? For instance, in early June, Darnstadt offered to do pro bono work to help damaged businesses

rebuild, which required design from a licensed architect; can that process be accelerated?

"We need to look at temporary solutions that allow us to critically analyze what a more permanent solution looks like," she says. "It's not a fixed, start-and-stop process."

Darnstadt's Boombox project, a series of small, 8-by-20-foot portable pop-up shops for small Chicago businesses, exemplifies her vision for mobile, malleable design. To create these low-budget, floating storefronts for small businesses and entrepreneurs out of shipping containers and cement board, Darnstadt met with potential operators and nonprofits to learn about their needs, in terms of interior space and layout; compliance with city regulations (she helped write an ordinance that legalized the pop-ups); and how to best take advantage of outdoor space.

Originally introduced in 2015, the project has continually been refined over time; Boombox offers design services for businesses, in addition to managing and leasing the spaces. Darnstadt sees an even bigger future for these structures now, when businesses seek new ways to deliver goods and services in neutral locations, and buyers are wary of shopping indoors. With budgets tighter all around, there's great need for multi-functional small space and points-of-service hubs in communities.

"We fell into a common trap, thinking that we had a representative sample after a few interviews, and later found that there were so many organizations that felt left out, that couldn't afford good design," she says. "You need to constantly evolve to make the project work."

Buildings that reflect community need and engagement can also bolster local economies via community labor and business collaboration. Patricia Gruits, director with the Boston and Rwanda-based nonprofit MASS Design Group, says their design process always looks at ways to tap into local materials, labor, skills, and ingenuity. The firm has extensive experience working in Rwanda and other developing nations—work that has been informed by a core framework of collaboration as a way to improve the value and impact of a project. Gruits points to a number of decisions made in past projects—for the Butaro District Hospital in Rwanda, built in 2011, hiring local laborers instead of bringing in a bulldozer cost the same amount of money and provided local jobs; and relying on locally found or reclaimed material, from volcanic stone in Rwanda (used on the Butaro project) to beetle-killed pine in the U.S. (used during a 2015 dorm project for Colorado College), helped support local business and industry.

A Neighborhood History Lesson

The added value of tapping into community skills and vision can take many different forms. In Los Angeles, another chapter of OAC has spent the last two years designing a renovation of the Avalon Carver Community Center. According to Sarah Loy, a member of the LA chapter of OAC, the first six months were a neighborhood history lesson, gleaned from extensive community conversations and interviews, aided by Jamivo Elder, the director of the community center. Built in the '50s after being championed by local activist and civil rights leader Mary B. Henry, who helped found the Head Start program, the building has always been a progressive nexus for the South Central neighborhood. Loy and her collaborators sought to infuse that history with the neighborhood's new vision for its future (a colorful new mural on the building's exterior recalls woven fabric, a nod to Henry's vision for a space that weaves together the neighborhood). The pending final design now includes a music production space for local artists and students, low-income housing, a STEM learning center, and a shelter for transitional youth.

"Typically, projects like this involve communities working directly with a contractor, which means they don't have designers who can translate community vision into something concrete," says Loy. "In this case, we can step in and really help them define their new space and environment, and by listening, we can help shape their voice."

That may be the core lesson to deploy when working with communities in need; don't just assist or aggregate ideas, amplify their experiences.

"We have a role to play, and it's not that we're all powerful, it's that we're complicit in either healing or harm," Ogbu says. "This is a point where we might radically change how we practice."

Stevenson, of Chicago OAC, says that he sees the community-led design process as akin to running a church, something he did while growing up. He wants his designs to be something that people interact with, because there's shared ownership and vision. It's hard to build the relationships needed to accomplish that over a small period of time.

"We're not going to show up for 24 hours [and then leave]," he says. "You need to be embedded enough to care whether the solution works or not. I approach outreach by thinking, 'I would like our grandchildren to be solving problems together.'" **AIA**

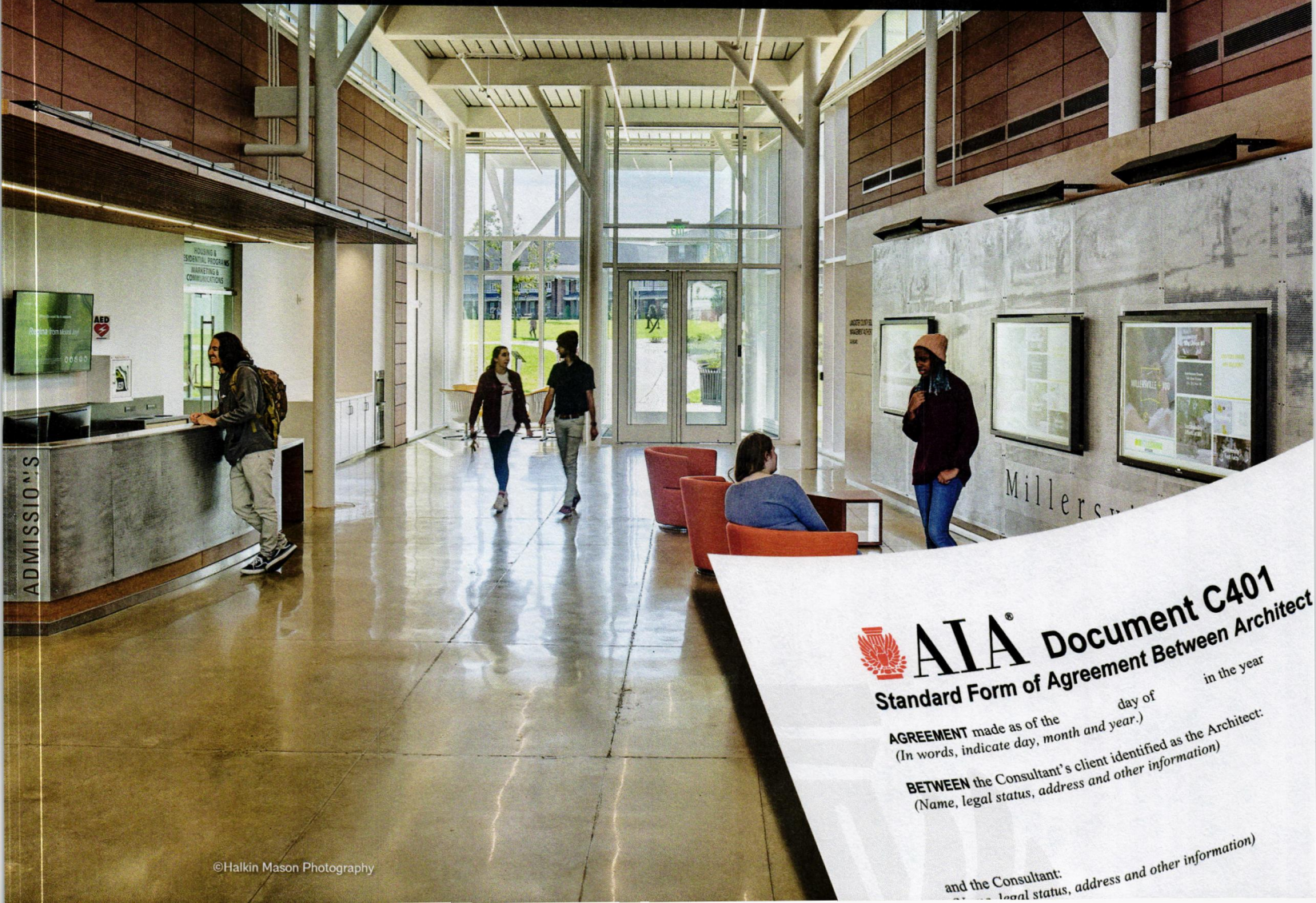
AIA Contract Documents


Real projects start with the industry standard

Before the project broke ground, Spillman Farmer Architects used an AIA contract to design and build **Millersville University's Lombardo Welcome Center**, designed to achieve Net-Zero.

AIA documents used: C401-Architect/Consultant Agreement

Learn more at aiacontracts.org/architectmag-lombardo



 **AIA** Document C401
Standard Form of Agreement Between Architect and Consultant

AGREEMENT made as of the _____ day of _____ in the year _____
(In words, indicate day, month and year.)

BETWEEN the Consultant's client identified as the Architect:
(Name, legal status, address and other information)

and the Consultant:
(Name, legal status, address and other information)

AIA Future

CREDIT: R



CREDIT: TRACY LEE

A Perfect Storm

How architects can plan for the intersection of COVID-19 and hurricane season.

By Amanda Abrams

Mid-2020 may go down in history as a summer of natural disasters: The coronavirus pandemic, an unprecedented biological disaster, will likely continue wreaking havoc around the country for the next few months—or longer. Meanwhile, NOAA has predicted an above-normal hurricane season this year, due to warmer-than-average ocean temperatures in the Atlantic Ocean and Caribbean Sea. And air temperatures across the country are slated to be hotter than usual this summer, leading to potentially dangerous overheating in urban areas and wildfires in the West.

These cascading events could utterly tax emergency management officials, who are already stretched in their efforts to respond to COVID-19. While FEMA and the Red Cross play vital roles in disaster preparedness and response, local governments take the lead in assisting residents before, and after, a disaster strikes. But responding in the middle of the pandemic will require a vastly broadened skill set: Shelter plans will need to be expanded to accommodate social distancing, for example, and officials will have to develop plans for contingencies such as flooding or power loss to hospitals with patients on ventilators, or to senior living facilities whose residents may be infected with COVID-19.

From the Ground Up

Some of these potential situations are outlined in FEMA's recent "COVID-19 Pandemic Operational Guidance for the 2020 Hurricane Season," which aims to align closely with the federal government's Guidelines for Opening Up America Again. It recommends temperature and health screening procedures prior to entry at all facilities or sites, cleaning and disinfection procedures, and instructions about face coverings, among other things. "The nation's emergency management system is most successful when it is locally executed, state managed, and federally supported," the guide reads—meaning that many details will have to be worked out on the ground by local emergency management officials.

Architects will have a distinct role to play as well in the upcoming season. While most aren't directly trained to respond to natural and man-made hazards, they do have a distinct knowledge base and set of capabilities that can be very valuable during disaster recovery.

"Architects by training have something to offer," says Al Comly, AIA; he serves as AIA Pennsylvania's state disaster coordinator, and is also on AIA's national Disaster Assistance Committee. "We know something about human behavior in terms of how design works. And a good part of [disaster response] is about human behavior and how to modify it." Architects are uniquely trained to handle all the different moving parts that accompany the response to a natural disaster. "If you liken it to designing a big project where the architect is facilitating the interactions between the engineer, the owner, the designer, and others—the architect is the composer that makes sure everyone is doing what they're supposed to be doing. It's the same when you're responding to a natural disaster," says Brandon Love, AIA, the deputy city manager of Lumberton, N.C., which was devastated by hurricanes Florence (2018) and Matthew (2016). "Architects in general tend to think a little differently."

But governments and the general public aren't necessarily familiar with architects' value-add when it comes to crisis recovery. Finding a point of entry or figuring out who to work with can be a challenge for anyone; the agencies in charge can vary from county to county.

Getting Involved

AIA has some clear ways that architects can get involved in disaster response. A first stop might be AIA's Disaster Assistance Committee (DAC), which has been around for decades. Among other focuses, the committee offers a volunteer Safety Assessment Program that trains architects and others in the AEC industry to evaluate homes and other structures after a disaster has occurred. The service can allow individuals to return to their homes quickly and thereby spend less time crowded into a shelter where the risk of contracting COVID-19 may be higher.

Usually, the program requires an eight-hour, in-person training, but DAC chair Scott Eddy, AIA, says that during this time of social distancing, it can be done virtually. He and his colleagues on the committee are determining other ways to ensure the safety of volunteer evaluators as they visit affected structures.

The assessment program is a way of becoming involved after a disaster has occurred, but architects can insert themselves in preparedness efforts as well—though those avenues aren't as established.

In New York, the New York arm of AIA's Disaster Assistance Program can serve as an inspiring example for interested architects.

In response to the spike in coronavirus infections that occurred there this spring, Illya Azaroff, AIA, the AIA New York state disaster coordinator, led an ad-hoc effort to lend expertise to the city and state.

It started with the N.Y. State Department of State contacting AIANY in search of a list of buildings across New York that could be used as alternative care facilities during the crisis. The call came on a Thursday, Azaroff says. "We activated our network of emergency architects, and then AIANY put it out to every architect throughout the state"—well over 9,000 people, he says. "By the next morning, we'd identified over 1,000 buildings for the Department of State."

That effort jump-started the creation of a unified task force of engaged AIA members, most of whom had many other ideas about how they could be of use. The group began meeting twice a week and eventually divided into eight subgroups with different focuses. One of the subgroups created a list of healthcare architects, engineers, and facility managers for the state Department of Health; another coordinated the 3D printing of PPE, which was then scarce; and another continues to develop advisories for building owners and managers that lay out HVAC and air quality standards in plain language.

"We're just a group that created an umbrella and is finding common ground," Azaroff says. "We're making sure people's ideas and work have a foundation and the traction to go somewhere."

The group was focused on the coronavirus crisis, but their work is relevant to any number of different types of disasters. And now that New York's peak of infections has passed, the task force is beginning to examine how to mitigate the compound effects of extreme heat, storms, and the coronavirus. In New York, the real issue is heat, not hurricanes. But the questions are the same: How do you

"We know something about human behavior in terms of how design works. And a good part of [disaster response] is about human behavior and how to modify it."

—Al Comly, AIA

AIA Future

CONTINUED

create barriers, design for social distancing, or expand the number of facilities in order to make sure that cooling centers or shelters aren't too crowded?

A Need for Space

In many cities and counties, officials are just beginning to look into additional sites for emergency shelters; by some estimates, they'll need roughly five times as much space as in normal years in order to meet social distancing standards. When asked about it, Azaroff says, "My answer is always, 'You need to engage your local AIA and get candidates for space.'"

When they do create a list of potential alternative shelters and care sites, architects can be aided by a new guide released by AIA in late May. The Re-Occupancy Assessment Tool provides parameters and strategies that will allow businesses, schools, restaurants, and other facilities to safely reopen and provide services. It lists designs and details meant to reduce the spread of infection, outlining elements like indoor and outdoor space planning, ventilation, and the design of restrooms, as well as policies and procedures covering symptomatic people and generally reducing the spread of pathogens.

In creating the tool, AIA sought to address a need for guidance for the built environment that holistically addressed the CDC's Hierarchy of Controls to ensure the public's health, safety, and welfare. An accompanying seven-step Risk Management Plan for Buildings helps architects to conduct a hazard analysis and assess potential primary and secondary risks. While the tool is largely focused on addressing the COVID-19 threat, it's also meant to be useful in the case of a secondary crisis, says Ken Filarski, FAIA. As the AIA disaster coordinator for the state of Rhode Island, he helped write the report.

In the case of a hurricane while the coronavirus is still a major worry, Filarski says, "What if they crowd a whole bunch of people into a gymnasium, or even a parking lot? That's a breeding ground for disease transmission."

"The protocols that are part of [the tool] will help in strategies and implementation in terms of how to care for people," he says.

It's a step-by-step guide that will help structures and spaces remain healthy and safe—created by people whose entire professional lives have been spent studying how humans interact with the built environment. **AIA**

AIA Perspective



A Tipping Point for Systemic Injustice

We can no longer be complacent.

The 15th Amendment in 1870. Brown v. Board of Education in 1954. The Civil Rights Act in 1964 and Voting Rights Act in 1965. President Barack Obama's election in 2008.

In our nation's slow and fitful progress in reckoning with the original sin of slavery, some years stand out as turning points. Could 2020 be a tipping point toward dismantling systemic racial injustice?

It must be. It is up to all of us—as individuals and as a profession—to do our part to make it so.

The righteous demonstrations spurred by the brutal murder of George Floyd by Minneapolis police seem to indicate a nation, and a world, finally awake to the destructive and deadly injustice that permeates daily life for people of color. It should not have taken Mr. Floyd's death—one of a devastatingly long line that includes Breonna Taylor, Ahmaud Arbery, and so many others just this year—to open the nation's eyes. But it does seem that eyes are open, and even the most complacent in our society can no longer ignore the fact of systemic, pervasive racial injustice—and collective culpability in sustaining it.

The fact that Mr. Floyd's death occurred during a pandemic that is disproportionately killing African Americans only underscores the reality that American society is failing people of color—not sporadically, but systemically. Not incidentally, but existentially. Health, home, safety, education, economic opportunity, environmental quality—no aspect of "life, liberty and the pursuit of happiness" is free from inequality.

It is a failure that extends back 400 years and takes different forms in different eras. In a

virtual town hall on June 3, President Obama emphasized that the injustices exposed in 2020 are the outcome of not just an immediate moment in time, but as the result of a long host of things—slavery, Jim Crow, redlining, and institutional racism." Noting that so many have been "awakened" to existing "structural problems," Obama described this moment as "an opportunity to work together to tackle them and take them on and change America and make it live to its highest ideals."

Our profession certainly has a role to play, and The American Institute of Architects is fully committed to action.

AIA's Board of Directors has made the decision to make addressing systemic racial injustice fundamental to the organization's mission. Addressing systemic racial injustice and inequity will be an organization-wide focus in the same way leading the fight against climate change is a fundamental focus of the organization.

For instance, there is no question that housing policy is one of many factors impacting the epidemic of discriminatory policing and outright brutality that jeopardizes communities of color. Accordingly, AIA's Board of Directors has committed to "address and work to correct the built world's role in perpetuating systemic racial injustice" including "designing housing that marginalizes communities of color, helping to design communities that exclude people of color, and participating in municipal projects that destroyed or weaken thriving African American, Hispanic, and Native American communities."

We're also looking inward, actively working to create a more inclusive governance and leadership pipeline, as well as develop a more diverse slate of award recipients.

It all starts by listening. We know we don't have all the answers. So we're holding listening sessions with stakeholders, partner organizations, and affinity groups to find concrete ways to break down barriers and redouble efforts to ensure that the profession more closely reflects the diversity of society.

In his historic 1968 speech to AIA's National Convention, National Urban League executive director Whitney M. Young Jr. challenged architects to "stand up and say something."

Let's make 2020 the pivotal year that we fully accept the challenge, not only to "stand up and say something" but to stand up and do something to help dismantle systemic racial injustice and inequity in AIA, in firm culture, and in communities in this country. **AIA**

Jane Frederick, FAIA, 2020 AIA President



Better for your brain

Makes waking hours more **productive**
and resting hours more **relaxing.**

Coming soon from TCP...the newest
innovation in LED lighting.

High Quality Vents for your "Special Project"

DRYER VENTS

NEW Model: **CFX-P**
4" & 6" Aluminum

Model: **SFB-P**
4" & 6" Aluminum

With Backdraft Flapper Damper

NEW Model: **CFXF-P**
4" & 6" Aluminum

NEW Model: **SB-P**
4" & 6" Aluminum

Model: **CFXC** 4" & 6" Aluminum

Model: **SFZC** 4" & 6" Aluminum

Model: **RCC-S** 4" & 6" Stainless Steel

VENT CAPS

NEW Model: **CFX**
3"-12" Aluminum

Model: **SX**
3"-8" Aluminum

Model: **KX**
3"-6" Aluminum

Model: **SXL**
10"-16" Aluminum

Model: **SFX-S**
4" & 6" Stainless Steel

Model: **SX-S**
4" & 6" Stainless Steel

Model: **RCA-S**
4" & 6" Stainless Steel

FRESH AIR GRILLES

Model: **JRC**
4" & 6" Aluminum

Model: **JRA**
4" & 6" ABS Resin

Model: **DK-M8**
3", 4", 6" ABS Resin

Model: **JSP**
4" & 6" ABS Resin

► If you are interested in becoming an authorized international distributor, please contact us. (Except the United States/Canada/Mexico/Japan)



SEIHO | seiho.com

We Ship Worldwide



“The protesters
may disperse,
the smoke clear,
and the sirens fade,
but one thing is
certain: We cannot
return to the old ways.”

**James Garrett Jr. Lists Actions for Architects, Institutions, and
Business Owners to Combat Systemic Racism** by Blaine Brownell, FAIA

The killing of George Floyd in Minneapolis is one of countless examples of police brutality against Black people, and the widely circulated video of his death at the hands of white police officers has triggered an outpouring of rage, grief, and heartache in cities worldwide. A significant portion of human society now stands united against racial injustice and is making strident calls for reform.

The architecture community shares this anger, pain, and sense of loss. Architects generally focus on creating and building, so Floyd's murder has led some to feel helpless—but inaction is not an option. What can architects do to make a measurable difference against racial injustice?

James Garrett Jr., AIA, has some answers. A fifth-generation Black resident of St. Paul, Garrett is a founder of the architecture firm 4RM+ULA and a colleague of mine at the University of Minnesota. He also knew George Floyd personally, making the news of his brutal killing even more devastating.

Although Garrett was not surprised that Floyd's death sparked protests, the fact that several of 4RM+ULA's commissioned projects were damaged—including two community art centers—has deeply unsettled him. "It's very traumatic for me to be in the midst of such intense destructive energy," he says.

Garrett feels that his highest value will be in the rebuilding process, but he says that time has not yet arrived. "There has to be an endurance of the pain, frustration, sadness, anger, and all the emotions of this destructive cycle—balanced with the understanding that there will be a moment when we shift, and the energy moves toward creating new things from the remnants of the old things that are literally and figuratively burning down."

When the time to build does come, Garrett will pursue a three-step approach that is standard practice at 4RM+ULA—and a method that he believes all

architects can employ to achieve more equitable and inclusive outcomes.

The first step is to organize a representationally diverse team that has broad-based knowledge and expertise. The second step is to establish a community engagement plan. Ideally, at least one team member should have a personal connection with the neighborhood in which a project is based. The third and final step is to leverage the work of one or more community-centered artists. As members of the design team, the artists will incorporate site-specific responses into a project as a further means of engagement. Garrett's three-pronged strategy effectively partners with diverse communities because community members can relate to team members, are heard and understood, and ultimately see themselves represented in the work.

Unfortunately, Garrett often witnesses a different approach employed by architecture firms that results in a "disaster capitalism" phenomenon. They do not hire or mentor a diverse staff, they lack a connection to the community, and they have no engagement plan, which creates an exploitative relationship. "You're going to jump in and cash in on the pain and suffering and explosion of decades of all kinds of inhumane treatment," he says, "and you're not putting any of that money, leadership, or opportunity into that community."

White-owned businesses and exclusively white selection committees can also present challenges. Architects can make a difference by paying attention to—and holding them accountable for—racial bias, explicit or implicit. As a partner in a minority-owned firm, Garrett is all too familiar with discrimination disguised as discernment. He is frequently invited to submit project proposals so that his presence diversifies the candidate pool. However, when his firm is not selected, the debrief is often suspect or problematic. "RFPs say the right things, but the goal posts move,"

A 4RM+ULA-designed campus for Juxtaposition Arts, under construction in Minneapolis, was vandalized during the civil unrest following the death of George Floyd.



INTRODUCING GLAZED

A provocative new series of glazed thin brick from Endicott offers a fresh combination of style, durability, trending colors and textures that will transform your design palette.

The Endicott logo features a stylized 'E' icon in a dark brown color, followed by the word 'ENDICOTT' in a bold, white, sans-serif font.

ENDICOTT

Learn more at endicott.com/glazed

The logo consists of the number '100' in a white, serif font inside a white square, with the word 'YEARS' in a smaller, white, sans-serif font below it, all set against a dark background.

100
YEARS



Left: 4RM+ULA collaborated with AECOM on the design and documentation of the 18 stations comprising the Twin Cities' Green Line Light Rail Transit.

Below: For two transit studies in the Twin Cities, 4RM+ULA is engaging with community residents to amplify their voices.

Garrett explains. Established criteria suddenly change during the process, replaced with new standards that are inherently biased; for instance, a minority firm invited to submit might later be told it does not have enough experience in the specific project typology.

Garrett argues that such expertise is difficult to obtain when opportunities are kept out of reach. When 4RM+ULA pursued a theater project, for example, the client rejected the proposal due to the firm's lack of theater-design experience. However, Garrett points out, no firm of color has had a chance to design a theater in the state of Minnesota. "The moment you make similar experience a criterion, you are committing to perpetuating the system of white supremacy," he says. "You can say whatever platitudes you want, comfortably knowing you don't have to work with firms of color. The message is: 'I've shown initiative in trying to be inclusive.' But you haven't."

Garrett has community allies who inform him when selection committees, often all-white, show signs of racial bias—a practice they call "the same old bullshit." However, not all firms vying for a project are aware of this phenomenon. To effect meaningful change, all architects should be trained to detect evidence of discrimination and hold the responsible individuals accountable. Architects serving on the client side must pay attention to shifting goal posts and other biased practices in order to stand up for people of color.

Other questions that Garrett recommends architects ask include: "What is your plan for equity? What is your procurement strategy? How does that translate into capital projects? How much of that gets into the bloodstream of the communities you talk about uplifting?"

The prevalence of discriminatory behavior in the design industry is a key reason that many Black architecture students pursue other career paths. Young people of color need compassionate mentors who can advocate for their academic and professional



development. Garrett has taught and mentored many individuals who have remained devotees to the field—and to him—for life. "I'm investing in young people, giving them opportunities," he says. "[T]hat's what it takes to build a different profession. That's the type of stuff that's necessary if we're going to build a community that reflects the community."

The protesters may disperse, the smoke clear, and the sirens fade, but one thing is certain: We cannot return to the old ways.

Eradicating systemic racial bias in architecture will not be easy, however. No one knows the magnitude of this challenge more than firm owners of color, who have uniquely faced a steep uphill battle since their existence. "I don't have any sympathy for a system that is systematically underserving me," Garrett says. "What's the opportunity cost for all these projects that I don't get over the years in terms of the growth of my business, and my ability to hire and train for this profession? The impact that we're having on young people—I could be doing a lot more of that. It's devastating for our industry, and nobody cares."



CREATE A HERO'S WELCOME FOR EVERY SHIFT

To address post-pandemic needs, hospitals are reconsidering every space. As easy-to-clean hard surfaces are being added, ceilings can help take on the acoustical heavy lifting. Our healthcare portfolio offers the largest selection in the industry – from panels and suspension systems to light coves and drywall grid. Learn how ceilings can help support our healthcare heroes at armstrongceilings.com/healthcare

CALLA® LAY-IN PANELS WITH PRELUDE® XL® SUSPENSION SYSTEM & AXIOM® INDIRECT LIGHT COVE
JOHNS HOPKINS SUBURBAN HOSPITAL, BETHESDA, MD / WILMOT SANZ, GAITHERSBURG, MD

Inspiring Great Spaces®

Armstrong®
CEILING & WALL SOLUTIONS

In this place creativity brews.

Ideas flow

Questions are raised

Proposals are made.

Here young men steal glances

Old friends reconnect

While ancient aromas

Guide the willing through history.

This is where discoveries are made

Relationships deepen

Meaning is found
and time is lost.

You're not designing a space. You're creating a memory.

A thoughtful design can open up new possibilities at every turn. Ultra-Tec® cable railing offers you more creative flexibility with solutions that are simple, clean and aesthetically pleasing. Count on us for the support you need to suit your unique taste.

To learn more, visit ultra-tec.com

 **ULTRA-TEC®**
CABLE RAILING

AMERICAN MADE SINCE 1998

**“The profession
needs to do all it can
to help and support
the growing number
of architecture
graduates of color as
they move through
the licensure process.”**

The Looming School Enrollment Crisis by Thomas Fisher, ASSOC. AIA

When will students return to campus? The COVID-19 pandemic has not only shuttered architecture schools around the country; it will also likely exacerbate a long-standing crisis in the profession. Architecture, much like higher education, is facing a slow-moving demographic disaster. The number of international students, who have buoyed university enrollments since the Great Recession, has started to slide. And enrollments of women and students of color may be on the rise, with women outnumbering men on many campuses, but the number of women and people of color who become licensed architects has not increased at anywhere near the same pace. If we want to increase the number of practicing architects and further diversify the profession, we need to respond to these demographic challenges.

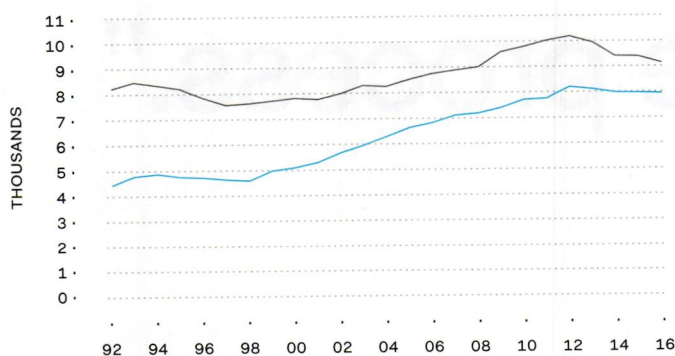
First, let's review the good news: Data collected by the Association of Collegiate Schools of Architecture (ACSA) in 2016 reveals that the gap in the number of male and female architecture students continues to close. There were nearly twice as many male students as female students enrolled in architecture schools in the early 1990s, but women are now within 3 percentage points of pulling even with men. While the gap remains larger within B.Arch. programs, the number

of women receiving M.Arch. degrees is now very close to that of men.

A similarly optimistic view of gender equality in the profession comes from the National Council of Architectural Registration Boards (NCARB). "In 2016, women accounted for 36% of newly licensed architects ... compared to 34% in 2015," a rate that, if it continues, would see the number of new female architects equaling that of their male counterparts by the mid-2020s. Women also outperform men in the time it takes from the start of school to the earning of a license—11.8 years versus 12.6 years.

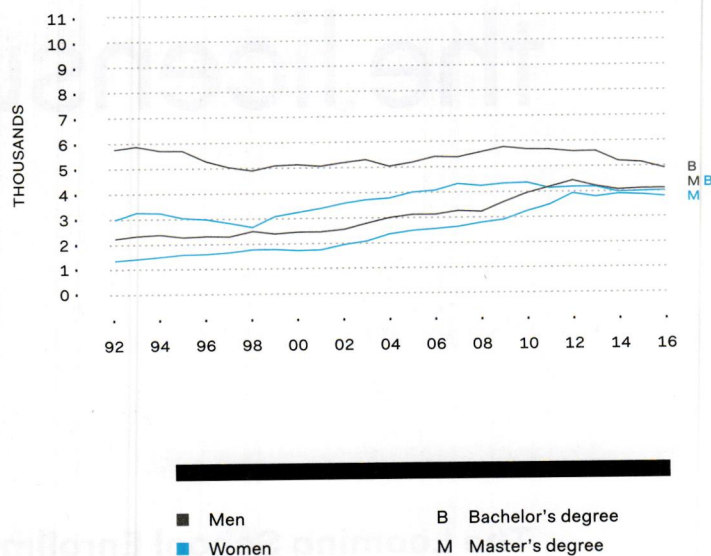
But the pessimists can make a case here as well. ACSA data from 2013 shows that the number of women working as architects has not nearly kept up with the number graduating from schools, suggesting that the profession needs to do a better job of keeping women in the pipeline. That includes improving pay equity and work-life balance at firms. ACSA data from 2015 shows that men's and women's salaries track very closely for the first couple of decades in the field, but that the salaries of women start to drop off after about 23 years of experience, with the median salary for women after 28 years almost \$20,000 lower than that of men.

The Closing Gender Gap for Design Graduates



Number of degrees conferred each year in architecture, city and urban planning, environmental design, interior architecture, landscape architecture, architecture history, architectural technology and building sciences, real estate development, and architecture and related services

Larger Gender Gap Among Undergraduates/Bachelor's and Master's Degrees by Year



What's Next?

Subscribe to the ARCHITECT newsletters, and find out.



ARCHITECT Newswire

- > Monday through Friday at lunchtime
- > The latest news from ARCHITECT and around the web



ARCHITECT Weekly

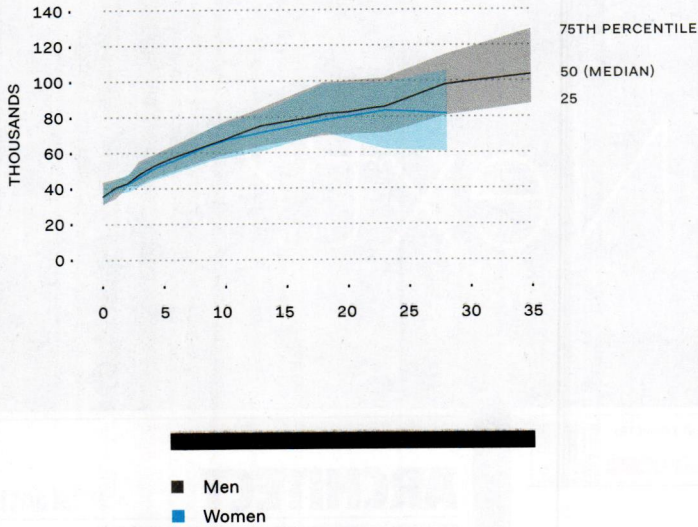
- > Tuesday afternoons
- > A round up of ARCHITECT's own top stories



ARCHITECT Project Gallery

- > Friday mornings
- > Hot projects of the week

U.S. Salary Ranges for Men and Women, by Years of Experience

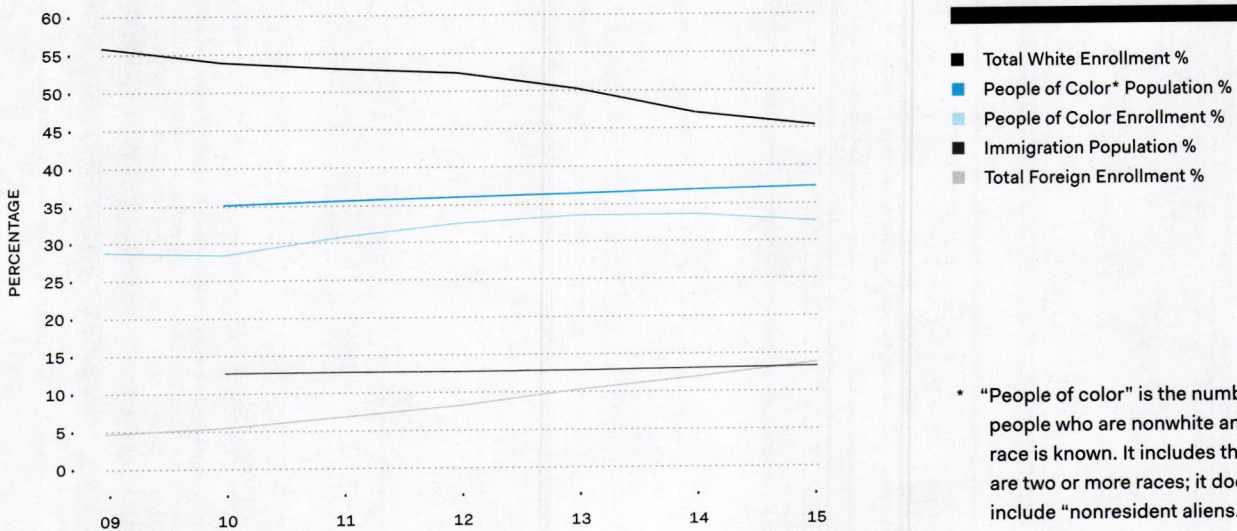


Diversifying the Profession

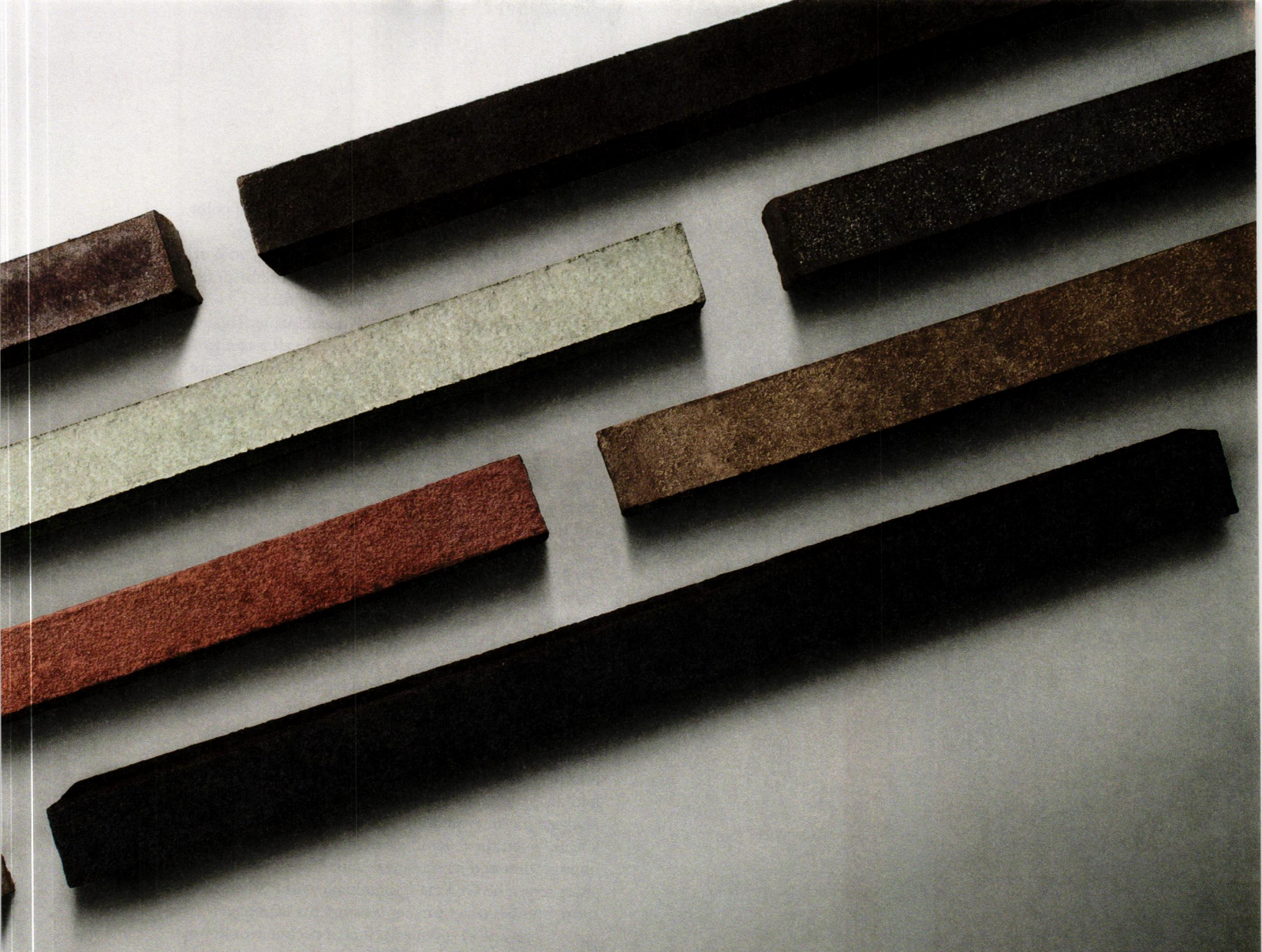
We can make another glass-half-full or -half-empty assessment of the diversity data. The profession has historically had a horrible track record when it comes to racial diversity: among NCARB certificate holders in 2018, only 2% were Black and less than 1% Latinx, despite those groups accounting for more than 12% and 16%, respectively, of the U.S. population. In that context, the growing diversity among students enrolled in architecture programs seems particularly impressive. According to 2015 ACSA data, well over 25% of M.Arch. and pre-architecture enrollees are students of color, representing a more than 10-percentage-point increase since 2009.

As the percentage of students of color has increased, that of white students has been on a steady, downward trajectory. White students constituted more than 55% of all architecture students in 2009 and accounted for 45% of the total by 2015. What is interesting about that figure is how it follows future projections of the U.S. population: demographers predict a more than 16% decline of white people as a percentage of the population between 2015 and 2055, when white people will be at, yes, about 45% of the total. In that sense, American architecture schools may be at the leading edge of a demographic trend already transforming this country.

Student Enrollment Percentages Compared to the U.S. Population, by Year



* "People of color" is the number of people who are nonwhite and whose race is known. It includes those who are two or more races; it does not include "nonresident aliens."



Length + Luxury

ROMAN MAXIMUS®

Elevate your aesthetic with elegant and elongated Roman Maximus from Sioux City Brick.
glengery.com/romanmaximus

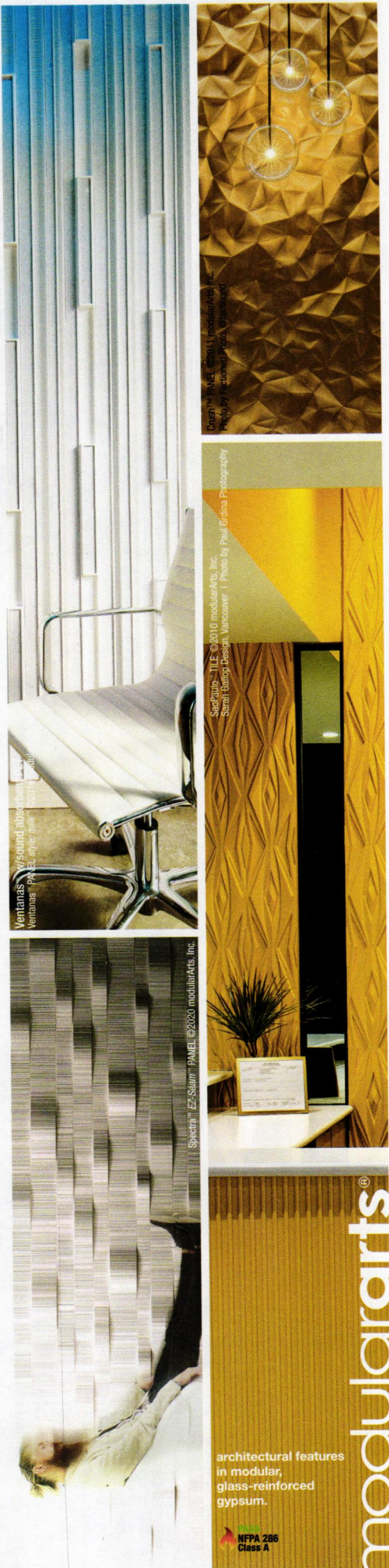


Whether the growing number of students of color will become architects, though, remains an open question. NCARB data shows that fewer than 20% of new architects identify as racial or ethnic minorities, even though they represent 30% of new ARE candidates and 42% of new AXP participants. This suggests that the profession needs to do all it can to help and support the growing number of architecture graduates of color as they move through the AXP and ARE process. The data on that front isn't encouraging. NCARB data from 2017 shows that while roughly 45% of new record holders identify as a racial minority, that drops to around 15% of those who are licensed, with the biggest gap occurring between the start of AXP and the start of the ARE.

The Decline of Foreign Students

Another diversity data point should also cause us concern. ACSA has tracked the steady increase of international students in North American architecture schools, from 5% in 2009 to roughly 15% in 2015. That is a higher percentage than in universities as a whole, where foreign students in 2015 accounted for about 5% of the total student body at U.S. universities, about a third of them from China. By 2017, however, the number of foreign students in American universities had dropped almost 7% from that total and some analysts see an even more precipitous decline ahead, given the federal government's stance toward immigration and its trade war with China. (In the short term, the COVID-19 pandemic will likely depress those numbers ever further, as students face travel restrictions and visa issues.) Such a decline would not only negatively affect architecture-school enrollments and their budgets, but also impede diversity efforts in the profession.

The overall architectural workforce could also take a hit if foreign students stop coming. While ACSA has tracked a rise in the number of architecture degree programs of all types, which have increased from about 600 in 1992 to 1,100 by 2016, the overall number of students in accredited programs has declined by roughly 6% between 2009 and 2017. That data may seem contradictory, but it reveals something important about the future of our field. Universities have responded to the growing interest in design and have created more diverse offerings—certificates, minors, and nonprofessional degrees—for those who may or may not have any intention of becoming architects. Optimists might see this as a good thing—more people want to learn how to think and work like designers—but pessimists might point to the softening demand for accredited degrees as a real concern.



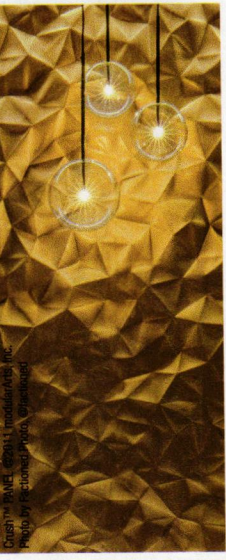
architectural features
in modular,
glass-reinforced
gypsum.



modulararts®

Spectra™ - TILE ©2010 modulararts, inc.
Serra Group Design, Vancouver / Photo by Paul G. O'Connell Photography

Spectra™ - EZ-Stack™ PANEL ©2020 modulararts, inc.





Prefabricated Modular Planter Systems and Screen Wall
Lifetime Structural Warranty Marine-Anodized Aluminum Frames
DeepStreamDesign.com (305) 857-0466



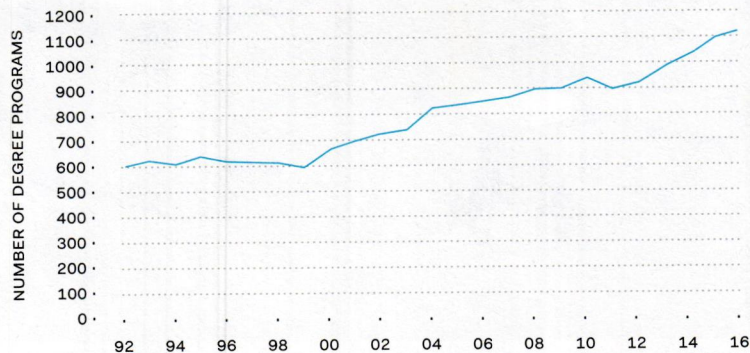
HANOVER® PORCELAIN PAVERS



Half Pint Creamery, Hanover, PA
Porcelain Pavers Woodland Collection

HANOVER®
Architectural Products
www.hanoverpavers.com • 800.426.4242

Increase in Architecture Degree Programs in the U.S. by Year



Number of degree programs in architecture, city and urban planning, environmental design, interior architecture, landscape architecture, architecture history, architectural technology and building sciences, real estate development, and architecture and related services

How to Grow the Profession

In the January 2018 of *ARCHITECT*, Kermit Baker, HON. AIA, posed the question: “How Many Architects Does Our Economy Need?” He concluded that “we’ll need about 25,000 additional architectural staff over the coming decade to handle growth in the construction industry and replace those who will leave the workforce. This need accounts for about half of all future graduates of accredited architectural programs nationally who are eligible to work in the United States.” Nobody knows yet to what extent the current economic downturn will change these long-term projections, but needing only half of all future graduates to become licensed sounds like an achievable goal. If the enrollment decline continues, however, the profession must find ways to spur a higher percentage of graduates to achieve licensure to keep up with the projected demand.

To attract both the number and diversity of architects we will need in the future, we must pay attention to how the profession gets portrayed in places where prospective students and their families look for advice. This year, *U.S. News & World Report* ranked “architect” sixth among the eight “best engineering jobs,” claiming that our field has “average” opportunities for upward mobility and workplace flexibility, but an “above average” stress level, which lowered our ranking. And WalletHub ranks architecture ninth out of 109 entry-level jobs, behind eight engineering careers, but well above other professions like law and accounting. Again, architecture does well in terms of job opportunities and growth potential, but poorly—59th place—in terms of long working hours.

In 2008, AIA held a “Diversity Plenary” in which it committed “to develop a profession that reflects the diversity of the communities, users, and the clients we



WHAT ITALY DID FOR
DESIGNER FASHION,
B&D BUILDERS DOES FOR
COMMERCIAL SPACES.

B & D
BUILDERS
LLC
Built Right or Not at All

Let's discuss your building vision.
717.687.0292 | BandDBuilders.com

NO-TOUCH DOOR HANDLES



DHC1

Door Handle Cuffs Minimize Contact

Prevent spreading germs and bacteria with 'no-touch' hardware

MOCKETT
DOUG MOCKETT & COMPANY, INC.

www.mockett.com
800-523-1269

Fine Architectural Hardware for Your *fine* Furniture®

ULINE



We provide over 37,500 shipping, packaging and industrial supplies to businesses across North America. From tape and tags to boxes and cushioning, everything's in stock. Order by 6 PM for same day shipping. Best service and selection – experience the difference. Please call 800.295.5510 or visit uline.com

Fire Resistant. Design Consistent.

Fire-Rated Aluminum Window And Door Systems

Aluflam has a complete offering of true extruded aluminum fire-rated vision doors, windows and glazed wall systems, fire-rated for up to 120 minutes. Available in all architectural finishes, our products are almost indistinguishable from non-fire-rated doors and windows. You won't have to compromise aesthetics to satisfy safety regulations.

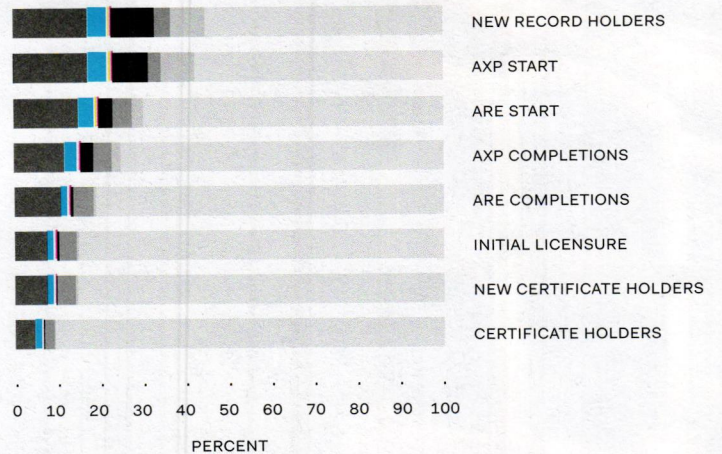
aluflam



Aluflam North America
562-926-9520
aluflam-usa.com

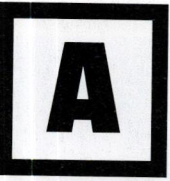


2017 NCARB Licensure Data



- White/Not Hispanic or Latino
- White/Hispanic or Latino
- Other/Not Hispanic or Latino
- Other/Hispanic or Latino
- Native Hawaiian or Other Pacific Islander/Not Hispanic or Latino
- Native Hawaiian or Other Pacific Islander/Hispanic or Latino
- American Indian or Alaska Native/Not Hispanic or Latino
- American Indian or Alaska Native/Hispanic or Latino
- Black or African American/Not Hispanic or Latino
- Black or African American/Hispanic or Latino
- Asian/Not Hispanic or Latino
- Asian/Hispanic or Latino

serve.” That goal remains achievable if schools and the profession see themselves as part of a singular, coordinated effort to reach out to underrepresented students in primary and secondary school and to create a path for them into architecture school, through AXP and the ARE, and into practice. The COVID-19 pandemic and the current economic downturn only makes the challenge all the more difficult. How many aspiring women and minority architects may be laid off or find themselves locked out of the profession? Will remote learning expose further inequity by limiting students who may not have access to the necessary technology? We need to remain committed to the goal of diversifying the profession because it’s the right thing to do. But it’s also a question of professional survival: Without such an effort, schools face a shrinking pool of students, and the profession a shrinking workforce. Demography may be destiny, but we cannot let it defeat us.

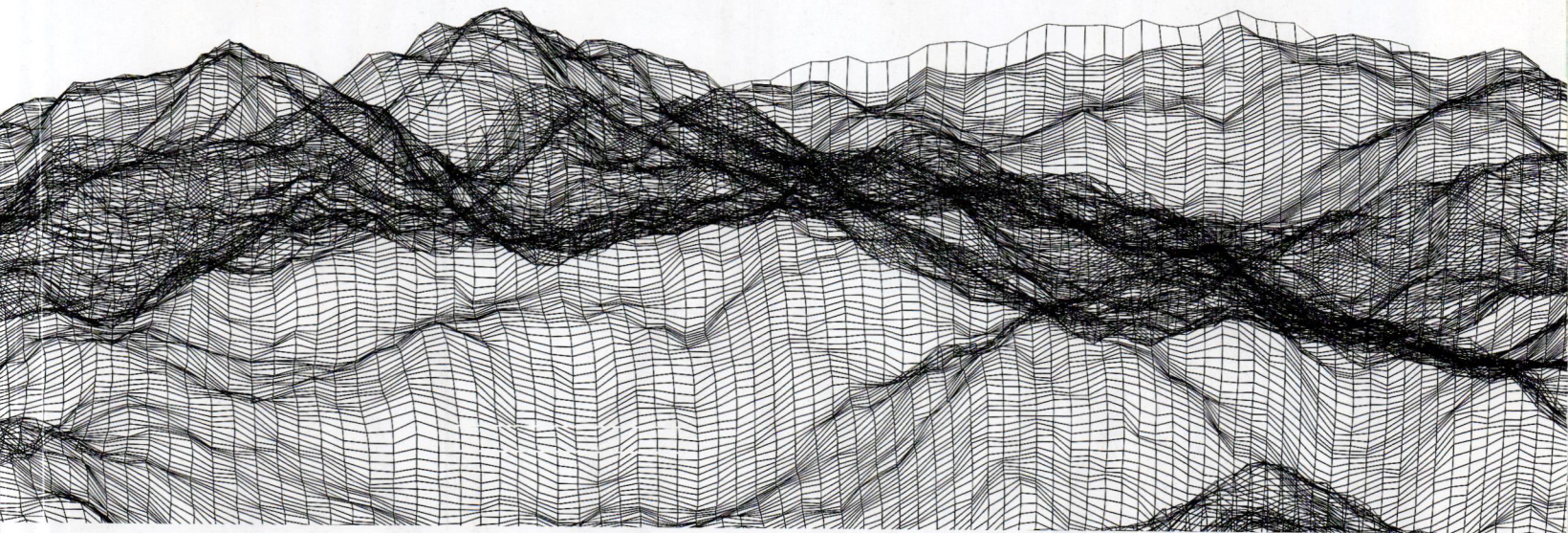


The **ARCHITECT** Podcast Network

Where we talk with the innovators working at the cutting edge of design, technology, and practice in architecture.

Come join us.

> bit.ly/ArchitectPodcasts



sponsored by

SAFTIFIRST
FIRE RATED GLAZING SOLUTIONS

Now available on



One of two prototypes
built with Zippered Wood
structural members that
subvert conventional notions
of the wall plane.



JURY

Steve McDowell, FAIA, principal, BNIM

K.P. Reddy, founder and CEO, Shadow Ventures

Ming Thompson, AIA, co-founder, Atelier Cho Thompson

the 14th Annual R+D Awards

PROJECT TEXT BY GIDEON FINK SHAPIRO

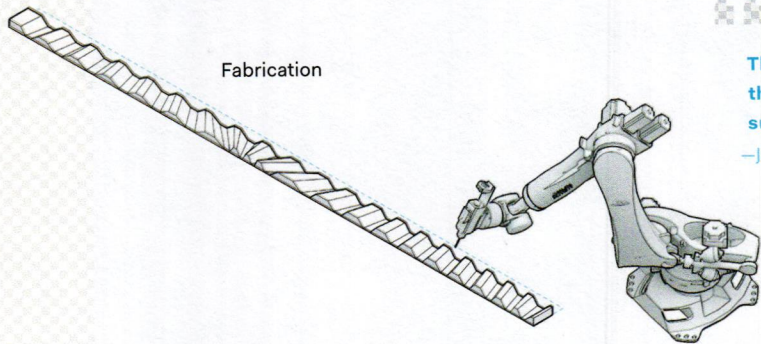
EDITED BY WANDA LAU

Society is confronting no shortage of crises, with climate change and housing access among the most critical. But the design community, undaunted, is responding with no shortage of thought-provoking ideas and new technologies, as evidenced by the 90 submissions to ARCHITECT's 14th annual R+D Awards. Jurors Steve McDowell, FAIA, K.P. Reddy, and Ming Thompson, AIA, evaluated each entry's potential to have a lasting, positive impact on the built environment and beyond—and its ability to, as Reddy put it, “iterate to something special.”

The resulting seven award winners have room to grow and scale while also “taking on fairly important and ordinary problems that the world is facing, or using data to help make better decisions for humanity,” McDowell says. Despite the challenges we face, Thompson says, “these projects are all hopeful about the future.”

Zippered Wood

University of British Columbia, HiLo Lab + University of Colorado, Denver, LoDo Lab + HouMinn Practice



Fabrication

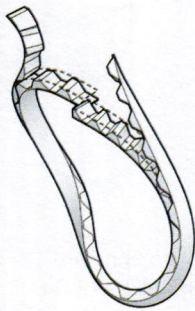


Through this analysis of standard sizes and fabrication methods, the team came up with something very sinuous, beautiful, and surprising from a 2x4.

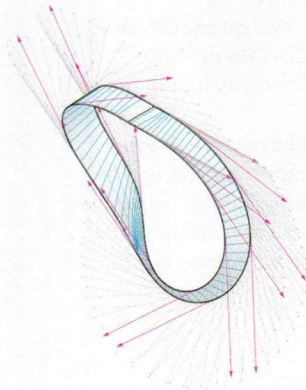
—Juror Ming Thompson



Virtual Tool Pattern

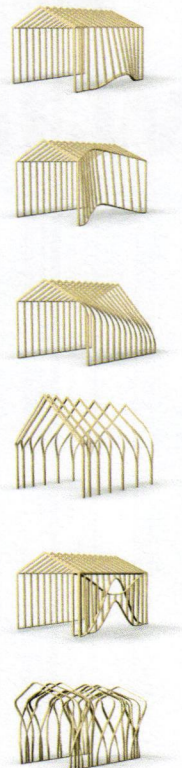


Vector Analysis Diagram



The “aha!” moment at the University of British Columbia’s HiLo Lab came when researchers, intent on bending strips of wood veneer into unusual forms, stepped back to look at their elaborate setup. “We realized we could use the formwork itself as the member,” says Blair Satterfield, UBC department of architecture chair and associate professor. + That breakthrough led to zippered wood, which leverages ordinary construction methods to create extraordinary structures with the humble 2x4. “We thought about the project both formally, in terms of what we can achieve cheaply and quickly with standard studs, and also in a performative way, in terms of efficiency and strength,” says Marc Swackhamer, ASSOC. AIA, who chairs the architecture department at University of Colorado, Denver and co-founded HouMinn Practice with Satterfield. + Starting with a cross-cut saw, the team created kerfs along 2x4s, enabling them to bend and twist. Using Grasshopper and the Kangaroo plug-in, they modeled the results and then wrote software protocols to map tooth patterns to specific curvatures. They upgraded to a CNC mill to cut teeth into 2x4s in such a way that two separate pieces of wood would lock or “zipper” only when they are hand-twisted together into the desired position. The mated pieces are clamped and glued to form a curving composite member with the dimensional cross-section of a 2x4. “Anecdotally, these bent and joined members are much stronger than a straight stud,” Satterfield says. + To demonstrate their project’s potential, the team built and exhibited two full-scale prototypes on the UBC campus in 2019. Most exciting, Swackhamer says, is the “democratizing potential” of a technique that broadens the possibilities of stick-frame construction.

Framing Possibilities



Dash x +

127.0.0.1:8050/map

ADUniverse Home Map Cost Estimator FAQ Transparency Testimonials Analysis Neighborhood View

Help us find your home:

This address bar only contains single family and multi-family residential parcels

2458 S EDMUNDS ST 98108

Let's find an ADU around you!

At least one of your neighbors has an ADU. Zoom out to see more on the map. The closest one @ 2422 S COLUMBIAN WAY 98108

Core Eligibility Details

<p>Zoning</p> <p>Your lot must be in a single-family zone to build an AADU or DADU</p> <p>Your home is eligible.</p>
<p>Lot Size</p> <p>Your lot must be at least 3,200 square feet in area to have a DADU</p> <p>Your lot is 5060 square feet and therefore is eligible for a DADU</p>
<p>Lot Dimensions</p> <p>Your lot must be at least 25 feet wide and 70 feet deep for a DADU</p> <p>Your lot's width is 55.0 and depth is 84.0 and therefore qualifies!</p>
<p>Lot Coverage</p> <p>If lot is larger than 5000 feet, no more than 35% should be covered. If lot is smaller, no more than 1000 plus 15% should be covered.</p> <p>Your 5060-square-foot lot has an estimated lot coverage of 24.90%. Therefore it is eligible for a DADU.</p>
<p>Shoreline</p> <p>Your home must not be located within the Shoreline District to be eligible for a DADU</p> <p>Your lot is not located in the Shoreline District, an area where DADUs are not allowed. Therefore your lot is eligible.</p>
<p>Existing ADUs</p> <p>A lot may have up to two ADUs</p> <p>No ADUs currently exist on this property.</p>

Want even more information? Please see the Transparency section for more details on these terms
[Explore the financial implications of creating an ADU on the next page](#)

Your home's Eligibility for an ADU

For an AADU, this home is eligible

Here are some pre-approved AADU plans to consider

For a DADU, this home is Eligible

Here are some pre-approved DADU plans to consider

This property is eligible to build both an AADU and a DADU!

Potential considerations of concern for AADUs and DADUs:

Given the age of your home, you converting existing space to an AADU could require substantial changes or upgrades to meet current building codes

Your property appears to be located in a floods-prone area. This may make it more costly or difficult to design, permit, and build an ADU

Your property has a side sewer that crosses another lot. You may need to reroute or construct a new side sewer for a DADU

More details on the eligibility criteria and your home's eligibility below

Check for neighborhood covenants

Other potential considerations for your lot:

Given the age of your home, converting existing space to an AADU might require substantial changes or upgrades to meet current building code requirements.
You have a sizable basement that could be converted to an AADU. An already finished basement will not be as expensive to retrofit for an AADU. A daylight basement in particular is quite attractive to renters.
Your home is near a frequent transit stop , making it attractive to renters of AADUs and DADUs.
Environmentally Critical Areas
Your lot has the following environmentally critical areas (ECAs) that may make it more costly to permit and build a DADU. (If list is empty, no ECAs are present)
Flood prone areas:
Your home has a side sewer that crosses a neighboring lot. You may need to reroute or construct a new side sewer for a DADU

ADUniverse

Rick Mohler, AIA + Nick Welch

Seattle is the 18th largest city in the U.S., but it has the nation's eighth most expensive rental housing market and third largest homeless population. About three-quarters of residentially zoned land is designated for single-family use, but the city wants to increase density. In July 2019, Seattle Mayor Jenny Durkan signed legislation to make it easier for homeowners to develop accessory dwelling units—smaller structures that can house guests or renters—on their properties, with the goal of adding rental housing options while offering a potential benefit to homeowners. + “The short-term goal is simply increasing the number of available housing units, but the longer-term goal is increasing equity,” says Rick Mohler, AIA, a University of Washington associate professor who serves on Seattle’s planning commission. Single-family neighborhoods with parks, playgrounds, and other amenities would become less exclusive. + To help

homeowners navigate the regulatory, financial, design, and permitting challenges of developing an ADU, Mohler teamed with city senior planner Nick Welch to create the app ADUniverse. In 2019, they developed a prototype with UW’s Data Science for Social Good program; a slightly modified, public version of the tool, developed by the city government, is expected this month. + With the app, homeowners can see if their lot is eligible for an attached or detached ADU. Existing GIS data on zoning, lot size, and coverage may be enough to produce a yes/no verdict, but more nuanced variables like tree canopy may prompt the user to contact the city for code compliance help. + In conjunction with launching the app to the public, the city is planning to release a set of 10 pre-approved ADU plans to streamline permitting and design. The plans emerged as winners of a design competition that was part of a city-led ADU development reform effort.

ADUniverse has tremendous potential to make code legible to people, empower citizens to shape their built environment, and help solve a problem that our cities are facing.

—Juror Ming Thompson



Stereoform Slab

Skidmore, Owings & Merrill

In an effort to improve upon the carbon footprint of the ubiquitous flat plate, the Chicago office of Skidmore, Owings & Merrill and Odense, Denmark-based formwork robotics firm Odico jumped straight to revolutionizing the form of the slab itself. They then demonstrated the potential of their innovation—Stereoform Slab—in a full-scale prototype. + “We wanted a structural solution to minimize the amount of material [used] to reduce the embodied carbon,” says SOM design partner Scott Duncan, AIA. “We wanted it to be implementable at scale, readily constructible, and no more costly than a conventional system.” Typical reinforced concrete structures incorporate 10- to 12-inch-thick plate slabs, which, though simple to build, require more concrete and rebar than other slab configurations, Duncan says. The Stereoform Slab

system is a mere 6 inches thick, and is supported by a “smart band beam” whose tapering form, optimized through computational design, efficiently transfers loads to columns spaced 45 feet apart, for a floor plan with 30-foot bays. “We’re able to achieve longer spans than a conventional flat plate, which means fewer columns [and less] concrete in the foundations of the building,” Duncan says. + SOM began designing the Stereoform pavilion about six months before its debut at the 2019 Chicago Architecture Biennial. Odico used a robotic hot-wire cutting technique to make the expanded polystyrene (EPS) formwork. This technique is much faster than CNC milling, says Odico chief technology officer Asbjørn Søndergaard, though it limits the form to “ruled surfaces,” which must be defined by the straight line of the cutting wire.

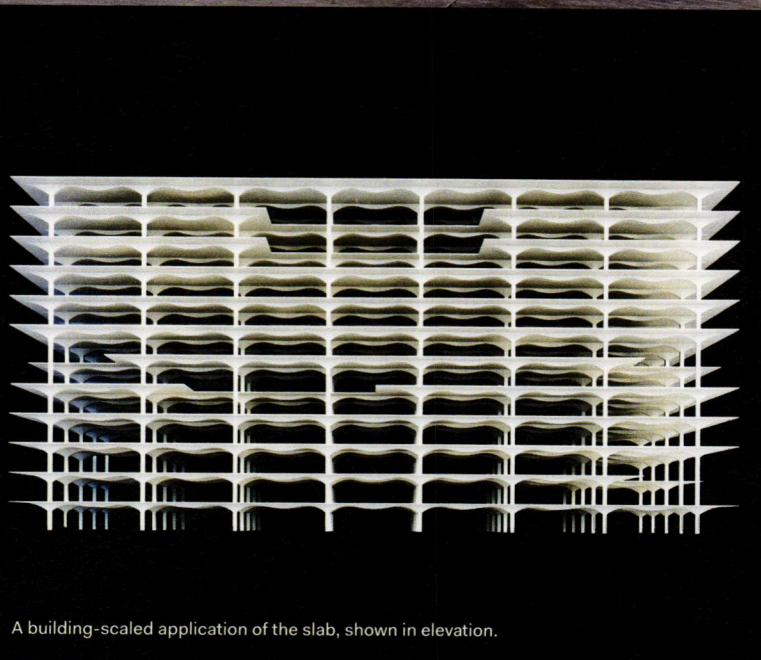
To make concrete beautiful like this, you have to build the formwork like cabinets.

—Juror Steve McDowell



The Stereoform Slab system debuted as a demonstration pavilion at the 2019 Chicago Architecture Biennial.

EPS is a petrochemical plastic product, Søndergaard acknowledges, but the EPS formwork takes less energy to produce than wood formwork and can be “almost 100%” recovered and recycled. + The resulting 70-foot-long, 24-foot-wide, 14-foot-tall pavilion, a potential module in a multistory structure, was erected in less than a week and uses 20% less concrete than a conventional slab with the same load capacity, according to SOM and Odico. The expressiveness of the structure adds to the Stereoform Slab’s appeal, Duncan says: “Our clients are drawn to the authenticity of exposed ceilings, higher ceiling heights, and the loft aesthetic.” + Stereoform’s captivating form, comparable strength, and competitive cost add to his conviction: “We’re committed to reducing embodied carbon and implementing this at scale,” he vows. “You have my word. We’re going to make it happen.”

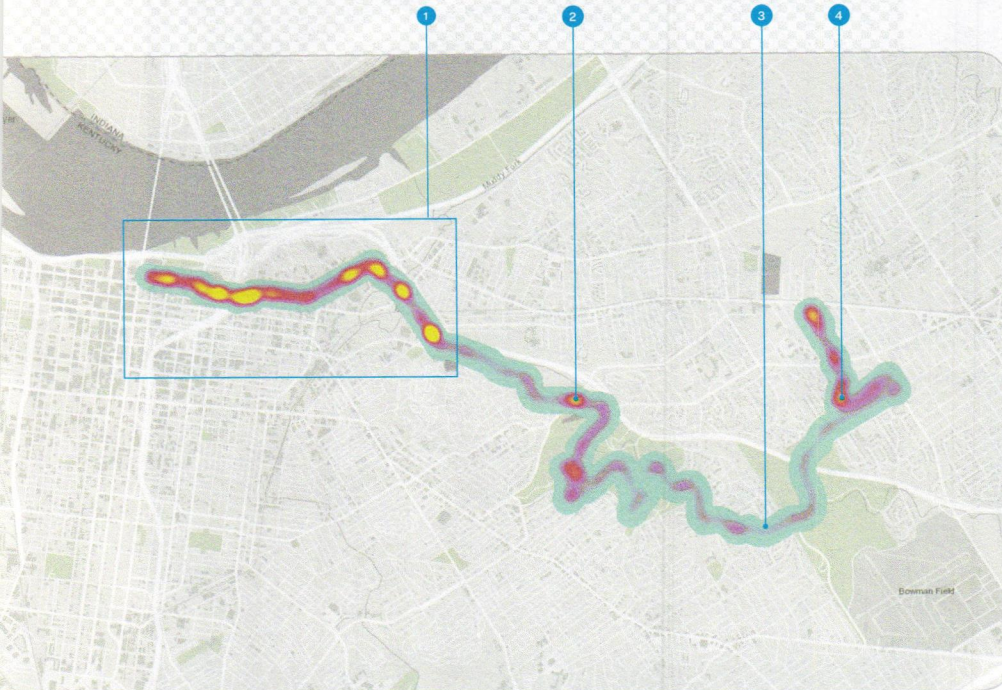


A building-scaled application of the slab, shown in elevation.

Empathic Design Process

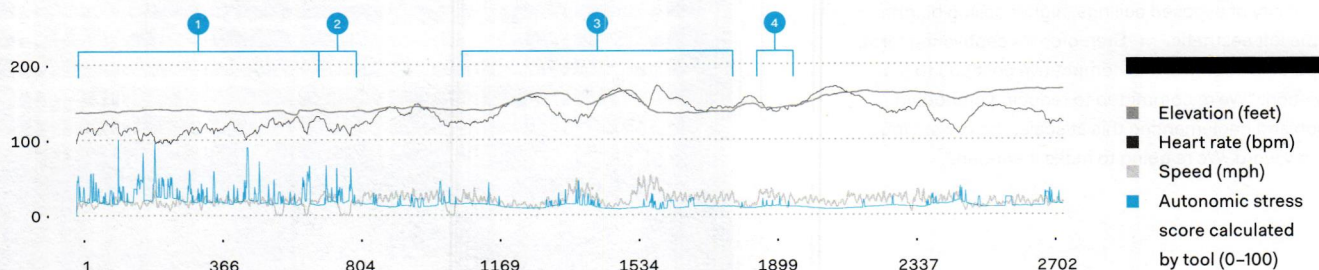
Gresham Smith's Studio X Innovation Incubator

Empathic Design Process Debugging and Validation by a Bicycle Commuter



1. The test user's stress levels were high in the city center, where the environment is not very user-friendly—despite the fact that the ground terrain here is flatter.
2. The memory of a collision with a car six months earlier still creates a stressful experience at the location of the accident.
3. The lowest stress was recorded in the parks, where an abundance of green space couples with a lack of conflicts.
4. The location of a former pothole, even months after its repair, still creates stress for the test user.

Data Analysis and Validation



As Mike Sewell, a lead engineer with Louisville, Ky.-based Gresham Smith, relished his 2019 bike trip across the Netherlands, he wondered if he could quantify and correlate his emotional response to specific places, and if the ability to objectively detect where people feel stressed or comfortable could be useful in planning and design. + Sewell enlisted colleagues from Gresham Smith's tech innovation unit to develop a patent-pending empathic data collection tool that works by comparing two datasets: geolocation data, as recorded on a smartphone or smartwatch; and the wearer's heart rate, which can serve as a biomarker in stress analysis. + Not all stress responses reflect the environment, Sewell notes; a person who is exercising, running late, or receives an angry text message, for example, could show an elevated heart rate unrelated to spatial design. Memories can also display in the data as psychological stress: "I was exhibiting remnant stress in a location where I was hit by a car a year ago," says Sewell, a bike commuter. + The solution, he says, is to gather larger datasets. "The more users we have, the more we can eliminate those [statistical] outliers." Biometric data should also be cross-referenced with data from surveys, user interviews, and direct observation to understand its significance. + Still, Sewell believes geolocated heart-rate data will allow one to corroborate "good design"—or the absence of it. The technology could improve the design of transit spaces and intersections, potentially reducing accidents, as well as hospital and airport environments. + The prototype works smoothly, Sewell says, but Gresham Smith is strengthening the platform—in which users opt to participate—to "handle lots of data very quickly, normalize the results, and improve the automation behind the scenes."

22

I see a lot of stuff [pitched], and I haven't seen anyone saying, 'Oh, we want to map emotional data,' which I thought was pretty cool.

—Juror K.P. Reddy

99

Walking Assembly

Matter Design + CEMEX

If ancient humans could create megalithic monuments without fuel-guzzling machines, modern society should be able to do likewise. "Every building component or object has intelligence," says Brandon Clifford, director and co-founder at Boston-based Matter Design and an associate professor at MIT. "In this work, we thought about transportation and positioning. How do you design the object so that it can be moved and placed with as little energy as possible?" + A shared interest in "embedding intelligence into objects" led Clifford to Davide Zampini, head of global R&D at multinational cement producer CEMEX. In 2017, their teams began collaborating on a series of eight interlocking concrete units, which range in weight from 926 to a staggering 3,902 pounds, and in height from 5 to 10 feet. The precisely irregular megaliths can be turned, rocked, and positioned by one or two

individuals with nothing but a pair of gloves. Strategic grooves, or dado joints, lock the masses together until their disassembly. + To make the units responsive to gentle nudges—like dancing with a partner, Clifford says—the designers calculated the location of each unit's center of mass. "Just moving the center of mass a quarter-inch will change the speed of rotation, how it rocks, how it moves," Zampini says. + To displace each unit's center of mass from its geometric location, the team used two concrete mixes with different densities to cast each unit. One unit was designed with two centers of mass: one when a hand-held tool is inserted into a socket, and the other when the weight of the tool is removed, causing the unit to ease into a standing position. + Admittedly, Walking Assembly is not suited for everyday construction, but the effortless maneuvering of immense forms is awe-inspiring.

The choreographic and dramatic aspects of this project are fresh and surprising. It's got a wonderful humanism to it: a kind of architecture that's conceptual and practical at its best.

—Juror Ming Thompson

1. Riding surface
2. Braking surface
3. Distribution plane
4. Curvature
5. Center of curvature
6. Resulting center of mass
7. Geometric center of mass
8. Contact point



De-Pave Park

upper 71st
percentile of
projects

11,506 tons
carbon
sequestered
beyond
emissions

3
years to climate
positive

VIEW SCORECARD

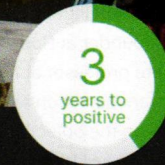
DESIGN SUGGESTIONS

Project Landing Page

MATERIALS

PLANTS

MAINTENANCE



3
years to positive

Climate Positive Design Scorecard

Project Name **De-pave Park**
Type of Project **Park**

Net Impact over 50 years

-11,506 tons

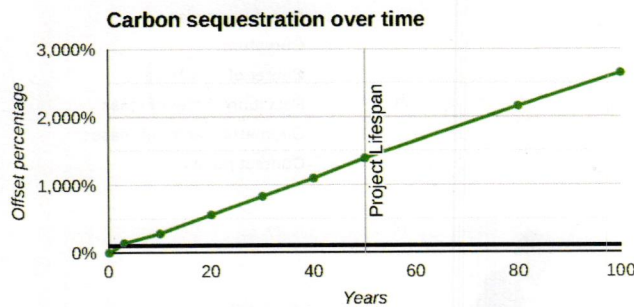
Total Embodied Carbon from Materials	2,758,260 lbs CO ₂ -eq
Total Carbon Sequestered by Plants over 50 years	26,391,279 lbs CO ₂ -eq
Total Operational Carbon from Maintenance over 50 years	69,845 lbs CO ₂ -eq

Total Area

1,133,694 sq feet

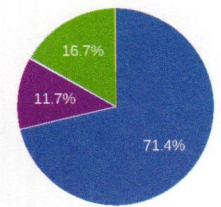
26.03 acres

Impervious area	304,419 sq feet	27% of total area
Permeable area	829,275 sq feet	73% of total area
Planted area	829,275 sq feet	73% of total area



Embodied carbon profile

- Paving
- Drainage / Irrigation
- Planting / Soil
- Transportation and Construction (Contingency)
- Other



Data Input Sliders

MATERIALS | PLANTS | MAINTENANCE

Filter by type

23 × Paving

Loose Aggregate Paving
Area: [Slider]

Wood Decking
Area: [Slider] 168000 sf
34,667 lbs of CO₂ emitted

Sand
Area: [Slider] Depth (inches): 0

Aggregate Base ♦ Compacted
Area: [Slider] Depth (inches): 0

MATERIALS | PLANTS | MAINTENANCE

Filter by type

7 × Trees

0 lbs of CO₂ sequestered

Growth Zone
 north
 central
 south

Deciduous Large - Mature height above 50ft (15m)

Deciduous Medium - Mature height 35-50ft (10-15m)

MATERIALS | PLANTS | MAINTENANCE

Filter by type

4 × Gas-Powered Equipment

Trimmers/Edgers/Cutters
[Slider] 20 hours/year
921 lbs of CO₂ emitted

Leaf blowers/Vacuums
[Slider] 10 hours/year
476 lbs of CO₂ emitted

Chainsaws
[Slider]

Lawn-mowers
[Slider]

Pathfinder

CMG Landscape Architecture

Until recently, landscape architecture has been mostly overlooked in attempts to reduce embodied carbon in the built environment. "Architecture has been collecting this data for years, but we're starting from scratch," says Pamela Conrad, a principal at CMG Landscape Architecture, in San Francisco. She and her collaborators are closing the gap with Pathfinder, a climate impact assessment tool for landscape architects that Conrad began developing in 2016; it launched last fall. + The online carbon calculator provides instantaneous suggestions for substituting building materials to reduce embodied carbon emissions and to improve carbon sequestration. These recommendations are meant for general guidance, as material selection is a nuanced process, Conrad says, but "by using the app, users are able to cut emissions by 30% to 50%, and double the sequestration from baseline expectations while still providing high quality design." + The tool requests user input on three design parameters: the quantity of materials that are sources of carbon emissions, such as pavement; the quantity of materials that are carbon sinks, such as plants; and anticipated carbon-emitting maintenance, like mowing or fertilizing. + The app uses data from the Athena Impact Estimator for Buildings and the U.S. Forest Service to calculate a Climate Positive score, indicating when the project's carbon sinks will offset its embodied and operating carbon footprint. The current carbon neutrality goal, calculated from 20 case studies integrating feasible interventions, is five years for parks and campuses, and 20 years for plazas and streetscapes. + As of April, Pathfinder had logged 858 projects from 621 contributors in 46 countries. A forthcoming version will factor in preliminary site disturbances, such as tree removal, demolition, and earthmoving. Conrad also has plans to improve the app's user experience, expand the material and plant database, and integrate life-cycle analysis data more seamlessly. + To increase Pathfinder's effectiveness and reach, Conrad convened an international advisory panel of industry and academic partners. Her own team of immediate collaborators spans five countries and multiple disciplines. + Conrad hopes that Pathfinder will help promote holistic carbon accounting across architecture and landscape. "I'm really looking forward to collaborating with more architects," she says. "We need to be working together."



This feels like a tool that gets designers engaged with material choices and material impacts very early in the design process.

—Juror K.P. Reddy



SITIVE DESIGN TOOLKIT

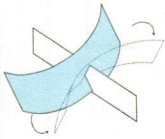
REDUCE EMBODIED CARBON IN MATERIALS

		USE AS SUBSTITUTE FOR
PATHWAYS		
WOOD BOARDWALK/DECKING		CONCRETE, STONE, CONCRETE UNIT PAVERS
DECOMPOSED GRANITE		CONCRETE, STONE, CONCRETE UNIT PAVERS
ASPHALT		CONCRETE, STONE, CONCRETE UNIT PAVERS
CHIP SEAL		CONCRETE, STONE, CONCRETE UNIT PAVERS
CO2 SEQUESTERING CONCRETE		CONCRETE (TYP. W/ PORTLAND CEMENT), CONCRETE UNIT PAVERS
CONCRETE WITH CEMENT SUBSTITUTIONS		CONCRETE (TYP. W/ PORTLAND CEMENT), CONCRETE UNIT PAVERS
RECYCLED-CONTENT UNIT PAVERS		CONCRETE UNIT PAVERS
ENGINEERED WOOD FIBER (EWF)		RUBBER SURFACING
WIELDED WIRE FABRIC (WWF) OR TEXTILE- REINFORCED CONCRETE (TRC)		REBAR
NATURAL DRAINAGE SWALES AND BIORETENTION AREAS		HDPE PIPE, CAST, IRON
LIGHTWEIGHT FILL		FOAM, CELLULAR CONCRETE
RECYCLED MATERIALS FROM THE SITE - CONCRETE		CONCRETE, ASPHALT

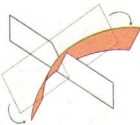
InVert Self-Shading Windows

TBM Designs

Bimetal Piece—Cold

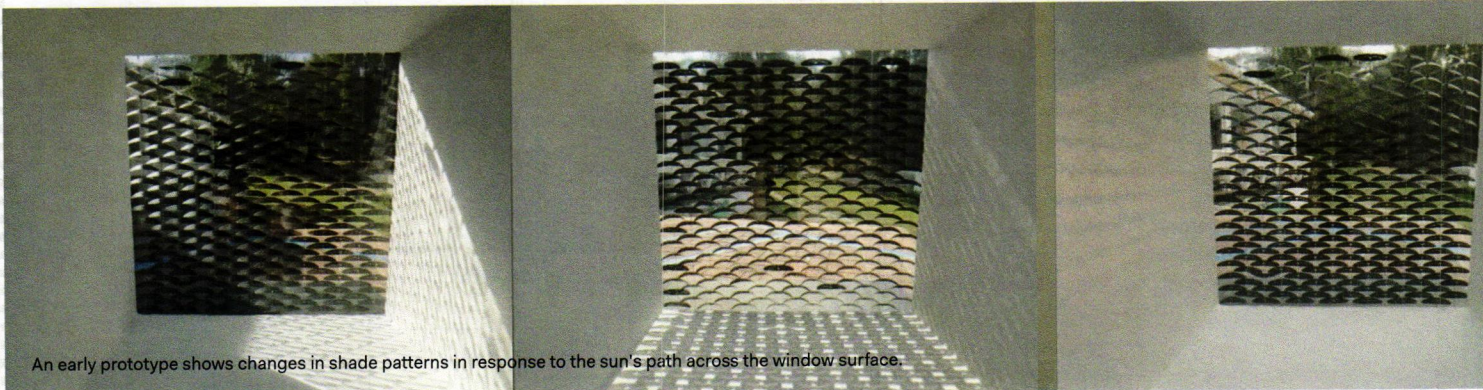


Bimetal Piece—Hot



Attempts to mitigate solar heat gain and glare through glass curtain walls often involve electrified systems such as automatic blinds, active fritting, or tinting controlled by sensors and software. However, Doris Sung, ASSOC. AIA, co-founder of New York- and Los Angeles-based TBM Designs and associate professor at the University of Southern California has an elegant, new solution that relies on nothing but the mechanical properties innate to its materials. InVert Self-Shading Windows is Sung's latest exploration into thermobimetals, the subject of her two previous ARCHITECT R+D Award-winning projects: an active façade and a self-assembling structure. + Thermobimetals consist of two different alloys laminated together. Because the two metals expand at different rates, the laminated sheet curls in different directions when heated or cooled, predictably and repeatedly, and with no degradation. Designed to be sealed within the cavity of an insulated glass unit, the InVert system consists of an array of bimetal pieces mounted on a stainless-steel network grid. When sunlight hits the window, the individual bimetal pieces warm and begin to curl, flipping into a new orientation

that blocks the direct light. + After experimenting with 50-plus shapes and sizes for the pieces, Sung and her team settled upon a 0.0027-inch-thick notched ellipse that resembles a pair of butterfly wings. "The shape and size of the pieces are based on the performance of the material to curl and behave the way we want it to, and the performance of the system to block the right amount of sun," Sung says. The angle of the V-shaped opening in which each piece sits controls the degree to which the piece can invert, allowing custom tuning for different climates and exposures. + TBM's InVert system also preserves the color spectrum of incoming daylight, which researchers have linked to occupant wellness. It offers a visible light transmission level between 60% and 70%, and a solar heat gain coefficient of 0.37 when used with low-iron glass; use with coated glazing would bring the SHGC under 0.25. + Following a successful field test of two prototypes, Sung intends to manufacture the windows for the commercial market. The bimetal sheets, which were laser-cut for the prototype, will be die-stamped and shipped to a local IGU fabricator for new or retrofit curtain wall and storefront installations.



An early prototype shows changes in shade patterns in response to the sun's path across the window surface.



“

This product is like a sunflower, mimicking nature. I loved that it uses bimetals and phase-change materials to make the action happen, which is super simple and super organic.

—Juror Steve McDowell

”

A stainless-steel network grid determines the density and inverting range of the bimetal pieces.

Advertiser	Page	Website	Phone
ALPOLIC Metal Composite Materials	7	alpolic-americas.com	800.422.7270
Aluflam North America LLC	64	aluflam-usa.com	562.926.9520
American Institute of Architects	38	aicontracts.org/architectmag-mandeville	
American Institute of Architects	43	aicontracts.org/architectmag-lombardo	
ARCAT	C3	arcat.com	
Architect Call for Opinions	12	bit.ly/AROpinion	
Architect Newsletters	57*	architectonline.com	
Architect Podcast Network Sponsored	65	architectmagazine.com	
Armstrong World Industries - Ceilings	53	armstrongceilings.com/healthcare	
ASI Group	3, 18	asigroup.us	914.476.9000
B&D Builders	63	banddbuilders.com	717.687.0292
DeepStream Designs, Inc.	61	deepstreamdesign.com	305.857.0466
Doug Mockett & Co. Inc.	63	mockett.com	800.523.1269
Endicott Clay Products	51	endicott.com/glazed	
Feeney, Inc.	9	feeneymakesiteeasy.com	
Glen-Gery	59	glengery.com/romanmaximus	
Goldbrecht	27*	goldbrecht.com	310.988.4455
Hanover Architectural Products	62	hanoverpavers.com	800.426.4242
ModularArts, Inc	60	modulararts.com	
National Grid	57*	ngrid.com/biz	
National Ready Mixed Concrete Assn NRMCA	10-11, 28	buildwithstrength.com	
Ornamental Metal Institute of New York	6	ominy.org	
Pac-Clad Petersen Aluminum	17	pac-clad.com	800-PAC-CLAD
SAFTI FIRST	14, 25	safti.com	
Seiho International	48	seiho.com	626.395.7299
Sierra Pacific Windows	4-5, 32-35	sierrapacificwindows.com	800.824.7744
Sierra Pacific Windows	36	sierrapacificwindows.com/videos	800.824.7744
Sloan	23	sloan.com/touch-free	800.982.5839
Steel Institute of New York	8	siny.org	
Sub-Zero Group	C4	subzero-wolf.com/contest	
TCP Lighting	47	tcpi.com	
The Studio Prize	27*	studioprize.com	
Uline	63	uline.com	800.295.5510
Ultra-tec Cable Railing	54	ultra-tec.com	
Zip System by Huber Engineered Woods	C2-1	hanleywooduniversity.com/course/7063	



Screenwall
DeepStreamDesign.com



Couverture

Simply the best furniture covers on the market.
877 434 1666
couverturecovers.com

INTRODUCING
GLAZED

ENDICOTT
endicott.com/glazed

100
YEARS

HYGIENE YOU
CAN BANK ON.
THAT'S SMART.

Hygiene is top of mind.
Touch-free delivers.

Support good hygiene.
Encourage savings.
bobrick.com/SureFlo

Specify Smarter
BOBRICK

**NAKAMOTO
FORESTRY**

Our definition of beauty
goes beyond the surface.

nakamotoforestry.com

NEW

PAC PRECISION SERIES
Box Rib 1

Wall panel systems in 12 variations
for ultimate design flexibility

PAC-CLAD
PETERSEN
A CARLISLE COMPANY

PAC-CLAD.COM | INFO@PAC-CLAD.COM



FOR INFORMATION on how to be a part of the next ARCHITECT MAGAZINE

special advertising section,
contact Phil Hernandez at
202-736-3381.



Editorial: Time to Stand Up

TEXT BY KATIE GERFEN

In the pre-dawn hours of June 5—less than two weeks into the civil unrest following the brutal killing of George Floyd at the hand of Minneapolis police officers—artists, volunteers, and city employees directed by Washington, D.C., mayor Muriel Bowser emblazoned “Black Lives Matter” in vivid yellow letters on a two-block stretch just north of the White House. Within 24 hours, the protest site had been visited by thousands, many taking photos with street signs proclaiming the stretch’s rechristening as Black Lives Matter Plaza, others decrying that a mural is no replacement for action in a centuries-long struggle for equality. The next evening, community organizers added “Defund the Police” in the same bold yellow.

The mural was quickly replicated around the country, in Charlotte, N.C., Oakland, Calif., Seattle, New York, and Montpelier, Vt., among other places. These murals’ backdrop, as it is of all protests nationwide, is the built environment. And the cries to dismantle systemic racism can no longer, and should no longer, be ignored by our country or our profession.

Architecture itself faces a long-overdue reckoning. Black people make up 13% of the U.S. population, but only 2% of licensed architects in the U.S. The number of Black female architects (like Tiffany Brown, ASSOC. AIA, who shares her vision for a more equitable profession on page 13) has more than doubled since ARCHITECT’s March 2007 feature on the 0.2% of the industry they then represented; there are still fewer than 500 nationwide.

Systemic racism and inequity in architecture are not limited to demographics. They are found in competitions that make token gestures at diversity and in project selection committees that require exclusionary prior experience—all of which affect the project pipeline for firms owned by people of color. In his conversation with ARCHITECT columnist Blaine Brownell, FAIA, (page 49), architect James Garrett Jr., AIA, identifies some ways that discriminatory practices can

be challenged. But the problem cannot be solved unless the industry, as a whole, stands up in support.

The design media is also complicit. At ARCHITECT, we endeavor to shine a light on gender and racial inequity in the industry, and to offer a platform to those who have ideas for improvement. But our other coverage has not included nearly enough Black voices, and has even, at times, unwittingly erased them. We have made mistakes, and will likely make more as we learn and grow. We can and will do better.

As the new editor-in-chief, I pledge to increase the representation of the work of Black architects and architects of color in our pages, and to cover that work at all stages of the design process to ensure that we do not perpetuate the inequities of the project pipeline. We will feature measurably more voices of color through interviews, hiring more writers of color, and commissioning even more op-eds from voices of color (a renewed call for opinion pieces is on page 12), so that we can amplify voices that aren’t heard enough.

As an industry, we must stand up to take part in this movement for change, to listen, and to ally ourselves to help. Dismantling systemic racism in architecture is not the responsibility of people of color. The hard work must be done by those of us who have, unwittingly or not, benefitted from or perpetuated it. The built environment must be equitable for all, and the only way to achieve that is to stand up for a more equitable profession. Together. Now.



kgerfen@hanleywood.com

Working from home can be a bit of an adjustment.



ARCAT has the tools to help AEC professionals design architecture from anywhere. BIM, CAD, specs, SpecWizard® and so much more!

No dues, no subscriptions,
no registration - just solutions.

ARCAT[®]
www.arcat.com

KDCC

KITCHEN DESIGN CONTEST 19/20

Compete in the 2019–2020 Kitchen Design Contest



Once again, Sub-Zero, Wolf, and Cove are excited to celebrate the best of the best in kitchen design during the 2019–2020 Kitchen Design Contest. For more than 25 years and 13 contests, we have celebrated over 14,000 designs and promoted nearly 800 design professionals. Enter today and compete to win the coveted title of Finalist and Global Winner—and more than \$275,000 in prizes that go with it.

ENTER ONLINE AT SUBZERO-WOLF.COM/CONTEST BY JANUARY 31, 2021

The contest is open to professional kitchen designers, architects, residential designers, interior designers, builders, remodelers, landscape designers, landscape architects, and students.

