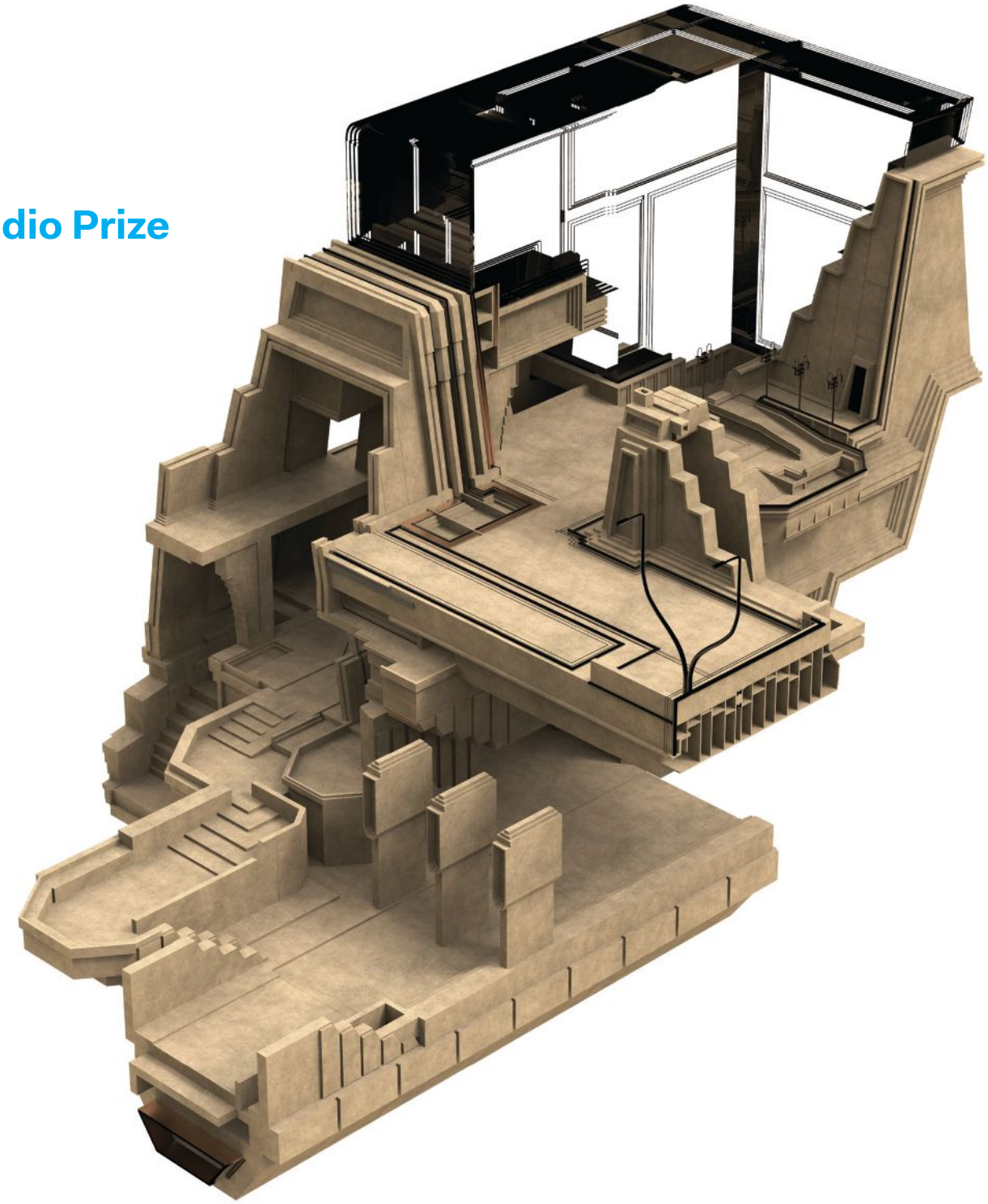
ARCHITECT

architectmagazine.com
The Journal of the American
Institute of Architects

The Studio Prize



ACOUSTICS FOR THE LOOK YOU WANT

SoundScapes® Shapes beautifully combine great acoustics with contemporary aesthetics. The panels absorb sound from all sides for more effective noise control. Select from 10 standard shapes and 14 standard colors, or create your own custom design. Visit armstrongceilings.com/shapes to learn more about the quiet good looks of SoundScapes® Shapes.

SOUNDSCAPES® SHAPES TRAPEZOID PANELS IN WHITE
UNIVERSITY OF NORTH TEXAS – STUDENT UNION, DENTON, TX
PERKINS + WILL

Inspiring Great Spaces®

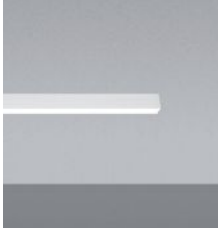
Armstrong® CEILING SOLUTIONS

whitegoods

MEC20L

architect: Gensler; photographer: ©Gensler / Ryan Gobuty

Whitegoods 20 Linear features a 0.7” lens with spot free even illumination, available as standard to any length. A range of unique mounting profiles allows seamless integration into walls, ceilings and furniture. High efficiency, sustainable LED engines in high CRI and a range of color temperatures to suit any space.



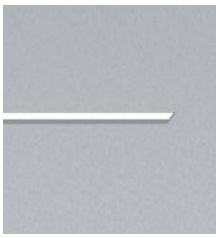
SM20LDL

S20LDL/S20LDI

P20LDL

B20LDL

UC20LDL

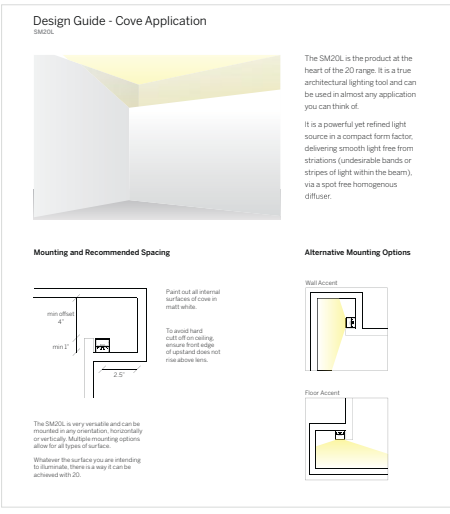


P/B 20LWW

MZC20L

MEC20L

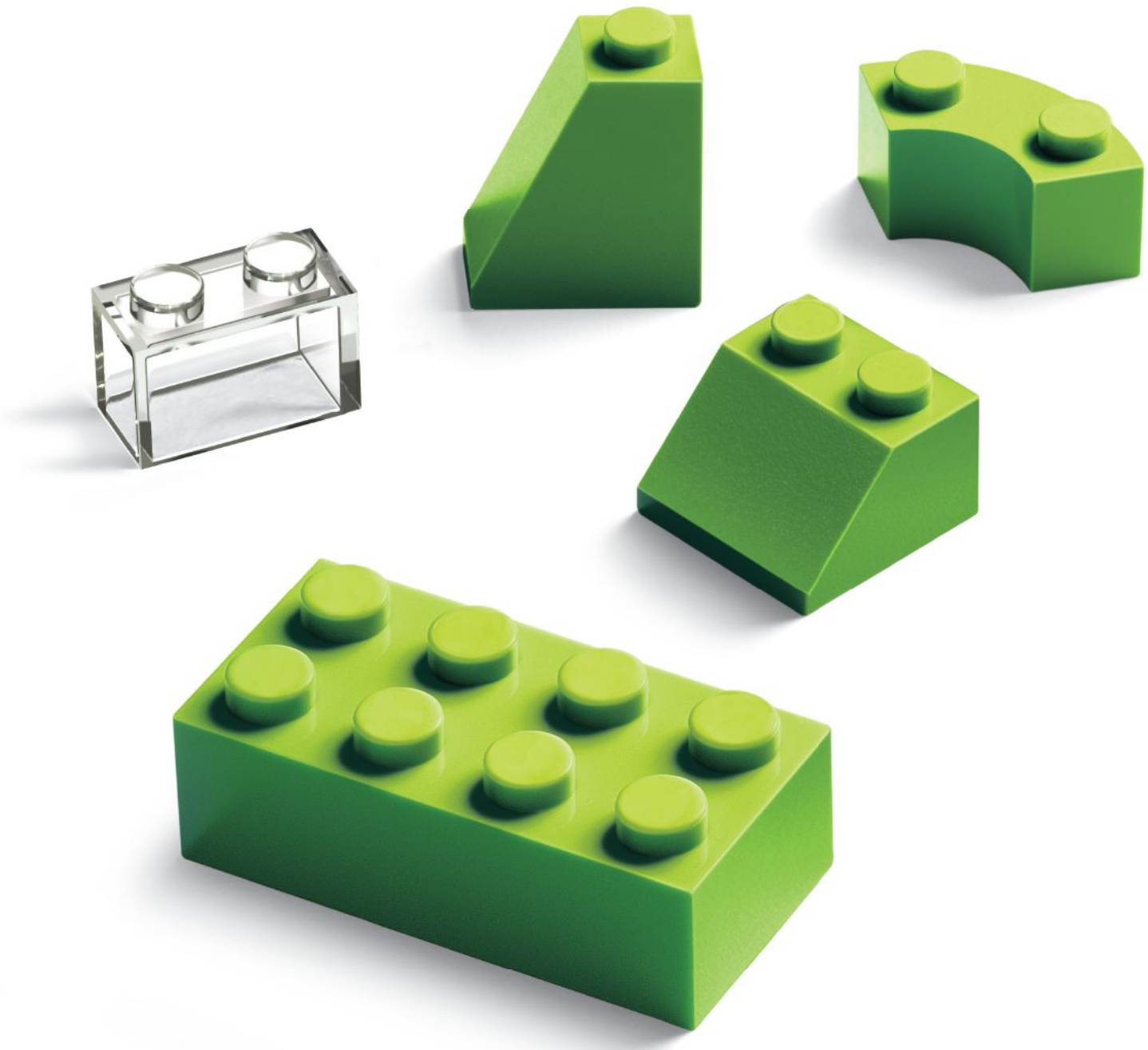
20 Linear Design Guide



Request Design Guides:
inter-lux.com/request

inter·lux
tools for lighting

answers@inter-lux.com



Engineered—
to work together

Only one company can provide fully integrated building envelopes.

If a building envelope is supposed to end up as one unified system—why cobble it together with disparate parts? Our curtain wall, windows, storefronts, skylights and glass are designed, engineered, tested and manufactured by the same company. Why? It makes buildings better. It saves you time. It reduces your risk. It just makes sense. So why doesn't every manufacturer do it? They can't. There's only one Building Envelope Company.™ Call 1-866-Oldcastle (653-2278) or visit us online at obe.com.

curtain wall

storefronts

windows

skylights

glass

Oldcastle BuildingEnvelope®

Engineering your creativity™

THE FUTURE *of* SHADE IS NOW

Architects play a unique role in shaping our world: Each design decision influences how people perceive where they live, work and play. But steel, stone, brick and wood aren't the only materials in an architect's toolkit. Intangibles, such as light, air and temperature, also affect the way people feel in a space.

Shaping light through the use of shading devices should be central to the design process because without shade, life can quickly become unbearable. Think of the worker whose office suffers from overheating and glare. Or the retailer whose customers don't linger because the pedestrian-oriented shopping district is too hot. Or the restauranteur who can't fill her patio seating because it's totally exposed to the sun.

Shade can boost commerce and improve worker productivity, not to mention it can protect people from health risks related to UV exposure. Shade design should be a priority whether the project is a streetscape, shopping area or high-rise office building.

LIGHT CONTROL = COST SAVINGS

Building energy efficiency and worker productivity can be tied directly to effective shading systems in office structures. People need natural light for emotional and physical health, but researchers are finding that control of these daylighting features is a key element in the performance of buildings and the people who work in them.

Electric lighting in buildings consumes 17 percent of all electricity generated in the United States, according to the U.S. Department of Energy.[1] Research into worker comfort and productivity shows glare reduction and automated systems that optimize shade and natural light can contribute to improved worker productivity and reduced energy costs.[2]

DRESS UP THE SKYLINE

Two architects recognized for innovative building shade designs in the Sunbrella® Future of Shade competition conceived of fabric shade systems as a way to upgrade building performance, improve occupant comfort and give buildings a distinctive presence in a city's skyline.

Puerto Rico-based architect and industrial designer Doel Fresse saw a need for automated shade in glass façade high-rise buildings, especially those located in the Caribbean. His conceptual design, "Helicon," is inspired by the shape of heliconia flowers ubiquitous to the island nation. Helicon's fabric panels create an intriguing geometric pattern on the building's exterior. The panels can be adjusted to create interior shade, reduce glare or allow more light into the building when desired.

Helicon, which is designed as a retrofit shade solution for existing glass façade buildings, improves the building's overall energy performance by blocking light before it enters the building. The system can also be flattened to the building's exterior to prevent damage during hurricanes or tropical storms.

Responsive Shading System by Arman Hadilou – United States

Helicon by Doel Fresse – Germany

For architect Arman Hadilou, the intense summer heat in Austin, Texas, spurred him to conceptualize the "Responsive Shading System," a kinetic façade of massive strips of fabric mounted on adjustable arms on the building's exterior. The system responds to the elements, twisting the strips to create bigger or smaller openings depending on the angle of the sun and the time of year. In this way, Responsive Shading System balances building energy efficiency with the need to maintain views.

The air gap between the building's glass façade and the fabric façade allows for ventilation created by natural convection.

CONCLUSION

Given rising global temperatures, creating energy-efficient buildings is more important than ever before. With shade at the center of the design process, architects can ensure energy efficiency is a priority, while also creating aesthetically pleasing buildings that promote occupant comfort.

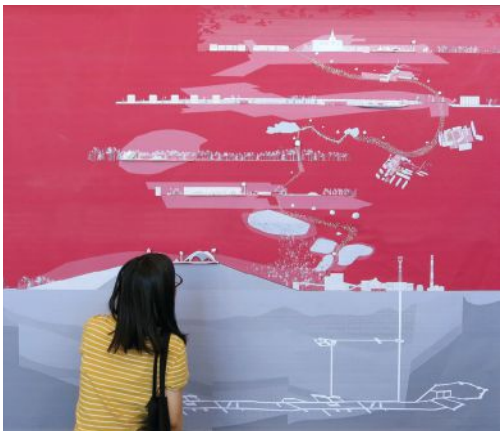
Find inspiration for your next shade design at
FUTUREOFSHADE.COM

sunbrella®

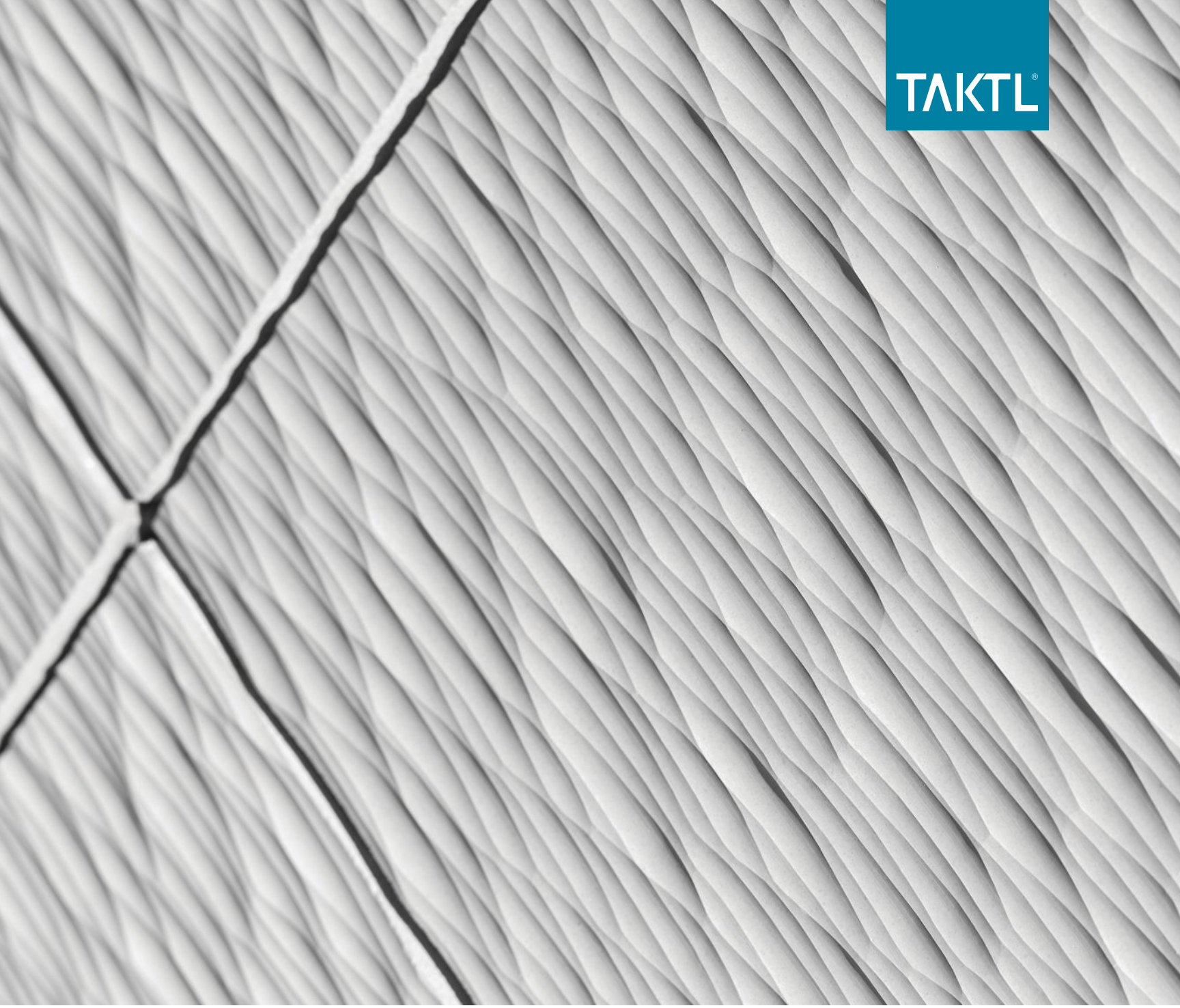
[1] "Trends in Lighting in Commercial Buildings." EIA, U.S. Energy Information Administration - EIA - Independent Statistics and Analysis, 17 May 2017.
[2] L Roche, "Summertime Performance of an Automated Lighting and Blinds Control System," Lighting Research & Technology, vol. 34, Issue No. 1 (2002) 11-25. Ossama A. Abdou, "Effects of Luminous Environment on Worker Productivity in Building Spaces," Journal of Architectural Engineering, vol. 3, Issue No. 3 (1997).

Contents

Volume 106, number 9. September 2017.
On the cover: Over-Under Bridge by Kyuhun Kim and Meari Kim, Real Fictions Cairo, University of Pennsylvania.



Volume 106, number 9. September 2017. ARCHITECT® (ISSN 1935-7001; USPS 009-880) is published monthly by Hanley Wood, One Thomas Circle, NW, Suite 600, Washington, DC 20005. 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.



MAKE A STATEMENT WITH TAKTL

TAKTL® offers a full line of architectural elements utilizing proprietary formulations, in-house mold fabrication, and a tightly controlled, automated production process. With over four times the strength of traditional concrete, TAKTL panels and cast elements perform exceptionally well in rainscreen applications and demanding climates.

Uniting the superior strength, durability, and precision of TAKTL's Architectural Ultra High Performance Concrete (A|UHPC™) with unparalleled design possibilities, TAKTL will change the way you think about concrete.

RIO

Introducing RIO™, the newest addition to our collection of surface textures and designs. Available in standard dimensions up to 4 x12 feet and our full range of colors and finishes.

Explore the possibilities at taktl-llc.com/textures

10 STANDARD TEXTURES + 12 STANDARD COLORS
ASTM C1186: Grade IV Certification
Made in USA

230 Braddock Avenue, Turtle Creek, PA 15145 | 412.486.1600 | info@taktl-llc.com

WWW.TAKTL-LLC.COM


SOLARBAN®90
Solar Control Low-E Glass
Vitro
SOLARBAN®72
Solar Control Low-E Glass
Vitro
SOLARBAN®70XL
Solar Control Low-E Glass
Vitro
SOLARBAN®z50
Solar Control Low-E Glass
Vitro
SOLARBAN®60
Solar Control Low-E Glass
Vitro
SOLARBAN®R100
Solar Control Low-E Glass
Vitro
SOLARBAN®60
Solar Control Low-E Glass
+ STARPHIRE
ULTRA-CLEAR™ GLASS
Vitro
SOLARBAN®z75
Solar Control Low-E Glass
Vitro
SOLARBAN®67
Solar Control Low-E Glass
Vitro

Find your comfort zone. On so many levels.

Establish a comfort zone with *Solarban*® glass by Vitro Architectural Glass (formerly PPG Flat Glass)—now under new ownership and driven by the same U.S.-based plants, people and products trusted by architects for years.

Within the *Solarban*® brand family of low-e glass coatings, you'll find a wide array of solar control performance and aesthetic options delivering unparalleled choices. Backed by 50 years of proven reliability and a formula for the future, you can find comfort in the *Solarban*® glass family.

Start your own stack of *Solarban*® samples at **vitroglazings.com/solarban** or **855-VTRO-GLS (887-6457)**.

ARCHITECT

The Journal of the American Institute of Architects

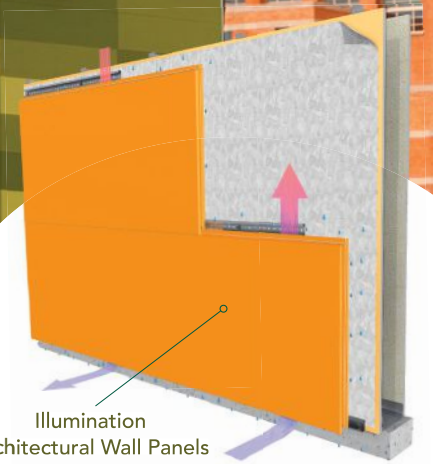
Marketplace Lofts - Studio [intrigue] Architects, LLC
Lansing, Michigan

NICHIHA
fiber cement

INTEGRATED RAINSCREENS HAVE NEVER LOOKED so brilliant.

START DESIGNING IN COLOR

COLOR X PRESSIONS



Looking for big and bold or soft subdued hues? Illumination fiber cement panels can help you achieve your vision… without compromising performance. Nichiha Illumination panels deliver sophisticated integrated moisture management and a quick and easy installation system without face fastening or specialty subcontractors. **When your project demands brilliance… specify Illumination.**

nichiha.com | 866.424.4421

See innovation in action...
nichiha.com/howto

WEAVING EXCELLENCE WITH INNOVATION

SHEERWEAVE
BY PHIFER

Quality. Service. American Made.

The market leader in product innovation with unique and exclusive features like Microban® antimicrobial protection and DOW ECOLIBRIUM™ bio-based additives, Phifer and the SheerWeave® brand represent the standard in interior sun control fabrics.

Choose from more than 35 SheerWeave styles, including basketweaves, twills and decorative jacquards. Our range also offers a host of eco-friendly fabrics with metallized, recyclable and PVC-free options.

Specify SheerWeave, the world's most trusted brand of solar screen fabrics.

PHIFER INCORPORATED

phifer.com/suncontrol
800-221-5497

PROTECTION THAT LIVES ON MICROBAN®

Microban® antimicrobial protection inhibits the growth of stain-causing bacteria, mold and mildew on the shade.

GREENGUARD GOLD

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

Proudly Made In The USA

Meeting code is only the beginning.

A single fire-rated OSB panel that gives you what you need to help you design what you want.

Do more than you have ever thought you could with LP® FlameBlock® Fire-Rated OSB Sheathing. It's engineered to meet fire codes, offers an Exposure 1 classification, and with a thinner panel it can deliver the same structural strength as FRT. Plus, it eliminates the need for an extra layer of gypsum as compared to common wall assemblies. It's a proven product that saves you money in the long run and gives you greater design freedom—all in a single panel.

LP BUILDING PRODUCTS

FLAMEBLOCK®
FIRE-RATED OSB SHEATHING

Cal. Prop 65 Warning: Use of this product may result in exposure to wood dust, known to the State of California to cause cancer.

Meet Code. Exceed Expectations.
LPCorp.com/FlameBlock

BUILD WITH US®

ARCHITECT

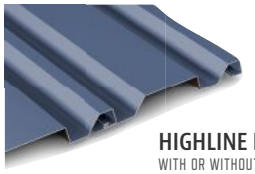
The Journal of the American Institute of Architects

Bold Visual Effects

NEW Precision Series wall panels create dramatic shadow lines

Arlington Community School, Jacksonville, FL
Architect: Ebert Norman Brady Installing contractor: Thorne Metal Systems
Profile: HWPC wall panel Color: Berkshire Blue

HWP
WITH OR WITHOUT CLIP



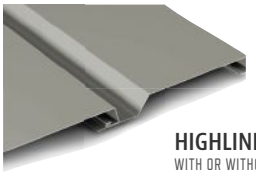
HIGHLINE B1
WITH OR WITHOUT CLIP

HIGHLINE B2
WITH OR WITHOUT CLIP

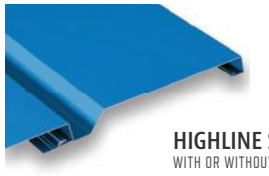
HIGHLINE C1
WITH OR WITHOUT CLIP

HIGHLINE C2
WITH OR WITHOUT CLIP

HIGHLINE M1
WITH OR WITHOUT CLIP



HIGHLINE S1
WITH OR WITHOUT CLIP



HIGHLINE S2
WITH OR WITHOUT CLIP

Precision Series wall panels provide design flexibility with easy, cost-effective, horizontal or vertical installation. Panels are available in 33 ENERGY STAR® colors.

PACGREENINFO.COM
YOUR GREEN METAL RESOURCE

PAC-CLAD®
PETERSEN

PAC-CLAD.COM | **IL: 1 800 PAC CLAD** | MD: 1 800 344 1400 | TX: 1 800 441 8661 | GA: 1 800 272 4482 | MN: 1 877 571 2025


JOURNEY THE WORLD.
ARRIVE TRANSFORMED.
Casablanca Step into this sultry reimagining of the Golden Era Movement. Discover the breadth of our entire collection of bathroom products at dxv.com
This DXV bathroom was designed by **Kati Curtis**.
DXV presents the Fitzgerald Freestanding Soaking Tub and Keefe® Collection Faucets.
© AS America, Inc. 2017
CLASSIC
GOLDEN ERA
DXV
MODERN
CONTEMPORARY


The patio ..


The patio ... is where the lighter side of life happ
Showing home buyers innovative patio and
increases their desire for an outdoor firepla
according Napoleon's new Hot Spots Resea
Napoleon outdoor fireplaces are the perfect addition to any backyard oa
Visit NapoleonFireplaces.com/Hotspots to receive a copy of the grou
Hot Spots Research Study and learn more about our entire product line


ens.
backyard designs
ce by 577%,
rch Study.
577%
asis.
ndbreaking
.
NAPOLEON

metrostudy
A hanleywood Company

hanleywood

Know who to target.

Introducing Metrostudy's OnTarget Consumer Intelligence. Your customer in detail.

He wants his children to grow up in a town where they have room to run, play, enjoy the outdoors and just be kids. Quality time together is at the core of his family. He wouldn't have it any other way. He's just one of a wide array of customers we can help you understand. And reach.

Learn more at WhyOnTarget.com

OnTarget
Consumer Intelligence
hw

adff

DESIGN DIRECTS EVERYTHING

adfilmfest.com

ARCHITECTURE & DESIGN FILM FESTIVAL
NOVEMBER 1-5 2017 NEW YORK

THE ARCHITECTURE & DESIGN FILM FESTIVAL (ADFF) IS THE NATION'S LARGEST FILM FESTIVAL DEVOTED TO THE CREATIVE SPIRIT OF ARCHITECTURE AND DESIGN. THIS FALL'S NINTH SEASON PROMISES A FANTASTIC LINEUP OF EVENTS–OVER 30 DOCUMENTARIES, INDUSTRY LEADERS, Q&AS, SPIRITED PANEL DISCUSSIONS, GREAT PARTIES... AND MUCH MORE.

CINÉPOLIS CHELSEA 260 WEST 23RD STREET

architecture & design
film festival

The American
Institute
of Architects

When You Rethink Everything, Doors Don't Just Open, They Vanish.

How do you design walls that open seamlessly to the beautiful landscape outside? You start with a window and door company that works tirelessly on new ideas. We'll show you innovations like lift and slide door technology that raises the standard of a tight door seal, and door systems with bi-fold panels that stack against a wall or pocketing multi-slide panels that disappear completely. We'll even give you ways to turn the corner of a room into a marvel of glass with a view. Doors that open up new possibilities – it's one of the many benefits of craftsmanship without compromise.

www.SierraPacificWindows.com | 800-824-7744 | A Division Of Sierra Pacific Industries

SIERRA PACIFIC™
WINDOWS

WALLACE NEFF; THE HUNTINGTON LIBRARY, ART COLLECTIONS, AND BOTANICAL GARDENS, SAN MARINO, CALIFORNIA, ARCHNEFF

Design Across Borders

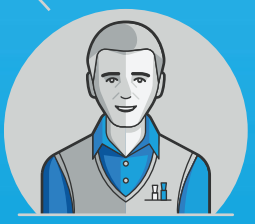
The prolonged, interlinked history of California and Mexico inspires "Found in Translation: Design in California and Mexico, 1915–1985," a new exhibition at the Los Angeles County Museum of Art. Organized around four themes—Spanish colonial inspiration, pre-Hispanic revivals, folk art and craft traditions, and Modernism—the show opens Sept. 17; it will feature more than 250 pieces including furniture, artworks, textiles, photographs, and films, as well as works from architects such as Richard Neutra, John Lautner, Luis Barragán, Ricardo Legorreta, and Wallace Neff (his Arthur K. Bourne House in Palm Springs is above). —AYDA AYOUBI

> *Read more about the exhibition at bit.ly/LACMAMexicoCA.*

FROM SKETCHES TO AS-BUILTS

Bluebeam® Revu® helps Architects initiate PDF-based design reviews that allow all project partners to collaborate on the same documents in real time. Teams of any size can easily respond to submittals and RFIs—and save project time with a more streamlined punch process.

More than one million AEC professionals around the world trust Revu as their end-to-end digital workflow and collaboration solution.



ESTIMATOR

ENGINEER

SPECIALTY CONTRACTOR

GENERAL CONTRACTOR

DOWNLOAD A TRIAL OF BLUEBEAM REVU TODAY
BLUEBE.AM/DESIGN

BLUEBEAM®
A NEMETSCHEK COMPANY

CHRISTOPHER BARRETT

Buildings for Body and Soul

From an open-air waiting area in a Uganda surgical center by Kliment Halsband Architects to a geometric red pediatric clinic in Arkansas by Marlon Blackwell Architects, the seven winners of this year's AIA/AAH Healthcare Design Awards show how far the typology has moved beyond supplying sterile rooms for patient care. Even in the massive 509,500-square-foot Jacobs Medical Center at UC San Diego Health by CannonDesign, moments like the design of the nondenominational chapel (above) illustrate an understanding that healthcare architecture must be holistic. —SARA JOHNSON

> *Read about the rest of the 2017 AIA/AAH Healthcare Design Awards winners at bit.ly/AIAHealthcare2017.*

Curtain Call.

Want a low-maintenance curtain wall that's recognized for performance? Our proprietary materials maintain color to make beauty sustainable. The durable NBK terracotta facade system keeps clean aesthetics in the limelight.

NBKUSA.com

NBK® ARCHITECTURAL TERRACOTTA
A Hunter Douglas Company

TERRART™ LARGE, ROBERTS PAVILION AT CLAREMONT MCKENNA COLLEGE

COURTESY WHY

Cultural Ramparts at Edinburgh Castle

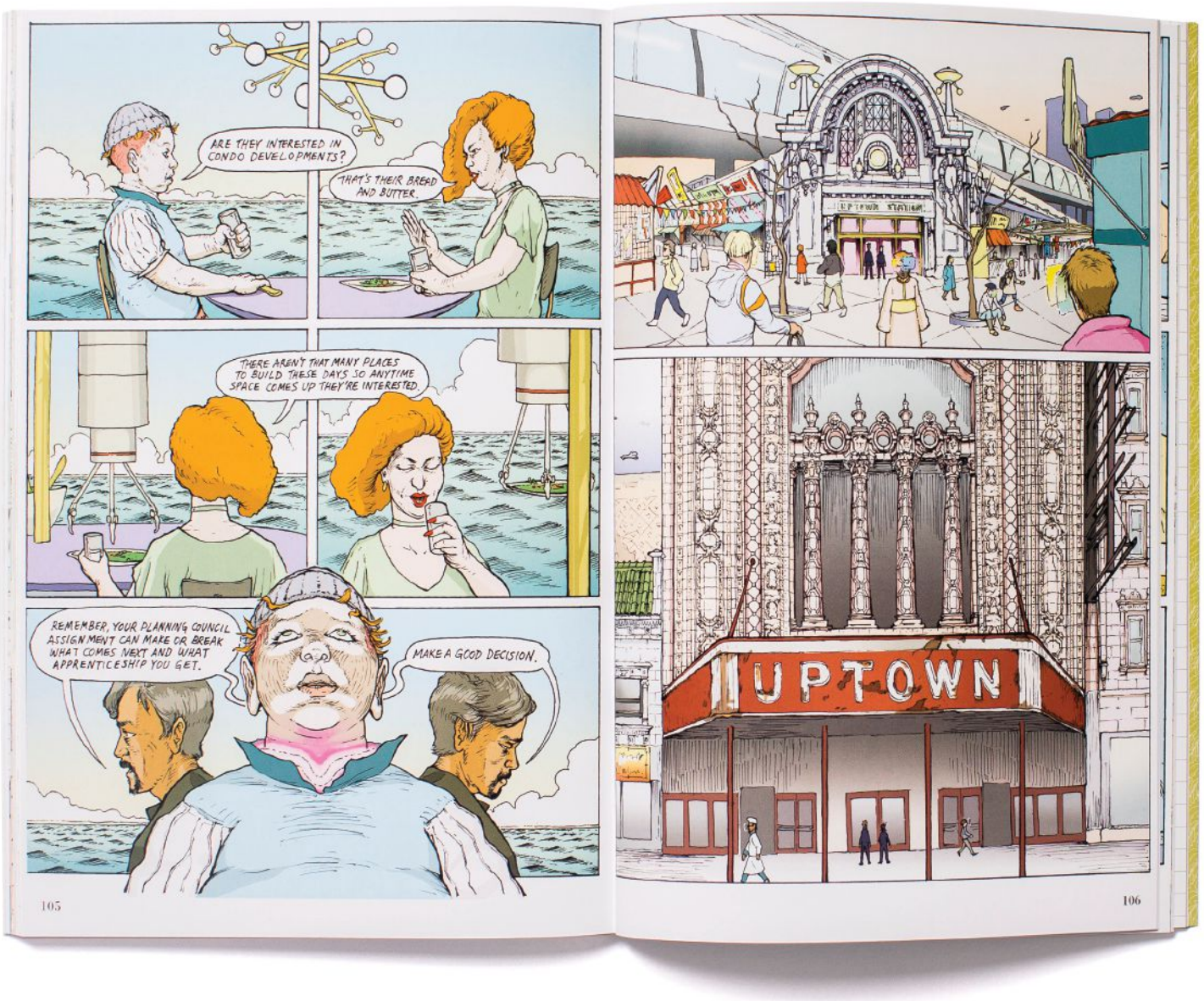
In August, a team led by U.S.-based design practice WHY was announced as the winner of the Ross Pavilion International Design Competition, held by the City of Edinburgh Council along with the Ross Development Trust. Located in the historic West Princes Street Gardens below Edinburgh Castle in Scotland, the £25 million (about $32 million) project, which will be the firm's first in Europe, will upgrade the gardens and embed within the landscape a pavilion for cultural events, a visitor center, and a café. Construction of the project is set to begin next year. —ASHLEIGH POPERA

> *Read more about the winning scheme for the Ross Pavilion International Design Competition at bit.ly/RossPavilion.*

SURE WE'RE GREEN—
JUST NOT INSIDE OUR HAND DRYERS.

Only our exclusive TRI-*Umph*™ hand dryer is 99% free from mold and bacteria. The green we're referring to is mold, mildew and bacteria and you won't find them in our TRI-*Umph*™ hand dryer. Unlike competitor hand dryers that collect water which turns into bacteria—TRI-*Umph*™'s unique design eliminates 99% of bacteria. Welcome to safe solutions—welcome to the new ASI.
For our new catalog, call 914.476.9000 or visit americanspecialties.com

ASI®
Integrated Solutions
Partitions · Accessories · Lockers



A Chicago Comic

A new graphic novel from the Chicago Architecture Foundation poses questions on issues such as gentrification and displacement across 17 local neighborhoods, as they affect the lives of teens past (1928), present (2017), and future (2211). *No Small Plans* (2017) by Gabrielle Lyon with Eyes of the Cat Illustration is inspired by Walter Moody's 1911 *Wacker's Manual*—an illustrated textbook that helped promote Daniel Burnham and Edward Bennett's 1909 Plan of Chicago in city schools. The novel is part of the foundation's new "Meet Your City" education initiative, and it is distributing 30,000 copies to Chicago teens over the next three years. —SELIN ASHABOGLU

> *Read more about No Small Plans at bit.ly/CAFNoSmallPlans.*

APRIL GREER

HOW PRECAST **BUILDS**™

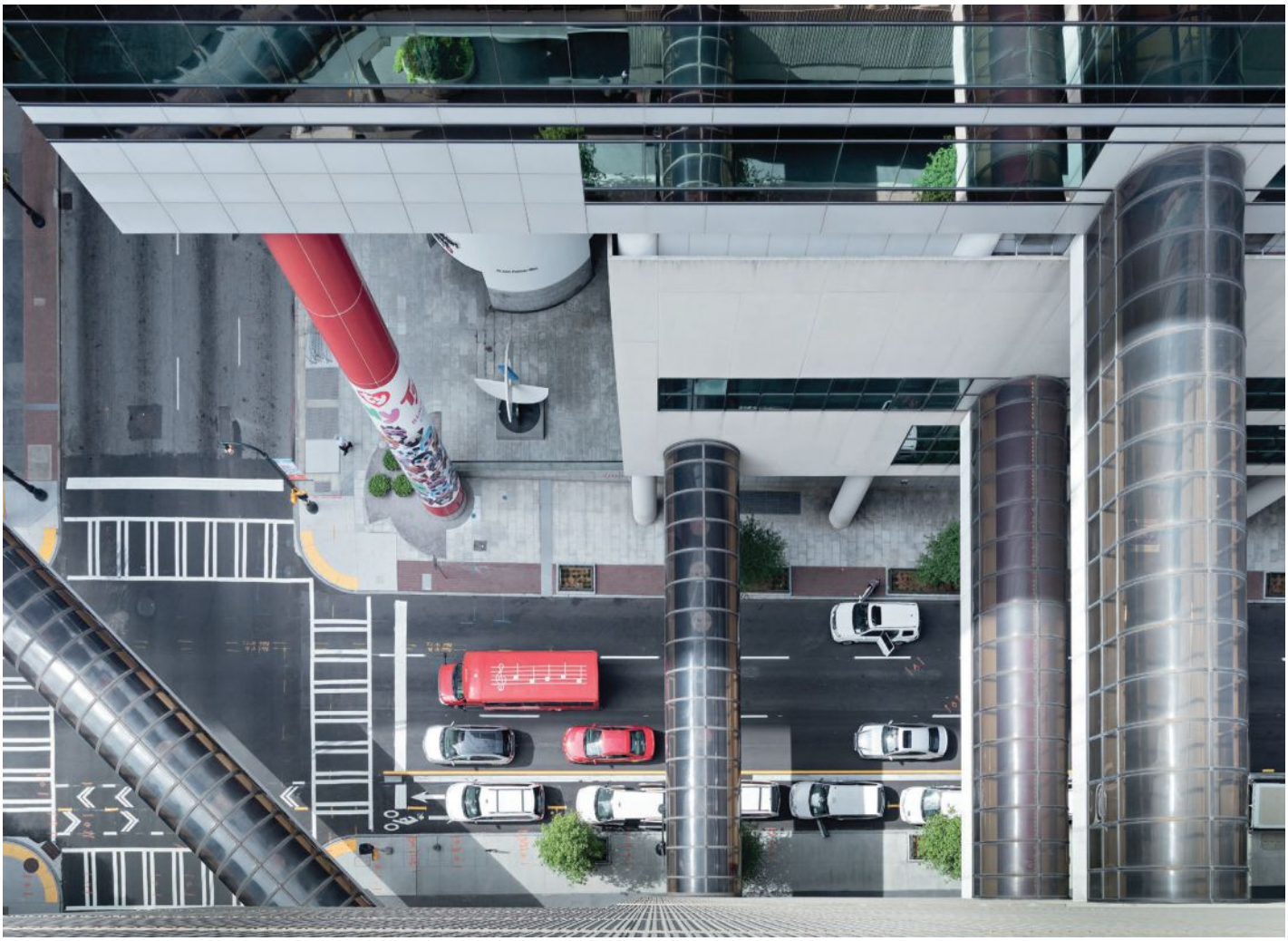
UCSF Mission Hall Global Health Sciences Building, San Francisco, CA. Photo: Bruce Demonte

THE SHAPE OF THINGS TO COME.

Style craves structure. Precast concrete allows voice to meet vision, encouraging connectivity at every possible synapse of learning. You can achieve brainy and beautiful on time and on budget.

PCI™
Precast/Prestressed Concrete Institute

Build smart with precast concrete. Find out more at PCI.org.



IWAN BAAN

Portman Pictures

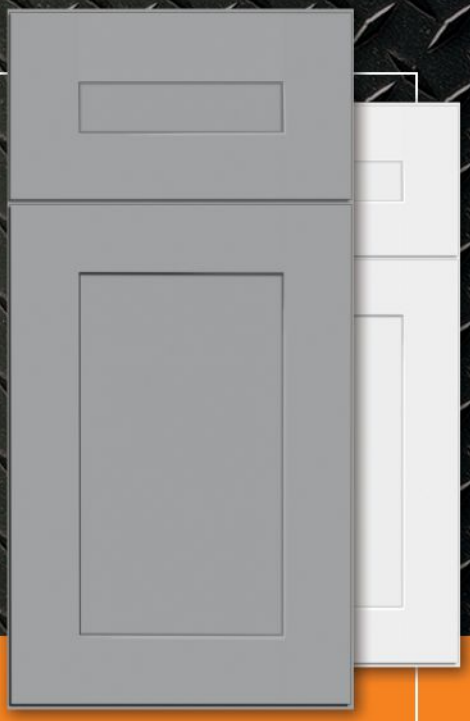
Featuring essays by Preston Scott Cohen and Jennifer Bonner, among others, a new book edited by Harvard Graduate School of Design (GSD) dean Mohsen Mostafavi, INTL. ASSOC. AIA, examines the work of Atlanta architect John Portman, FAIA. *Portman's America: & Other Speculations* (GSD and Lars Müller Publishers, 2017) includes commissioned shots by Iwan Baan. "The resulting photographs, rather than being formal or idealized images of buildings, capture the view as if in a state of distraction; Portman's architecture, and by extension Portman's America, is presented as it is today, for all to see," Mostafavi writes. —SARA JOHNSON

> *See more images from* Portman's America: & Other Speculations *at bit.ly/PortmansAmerica.*

SAVE TIME AND MONEY IN JOB LOT QUANTITIES

BULK PRICE ELIGIBLE

HAMPTON BAY

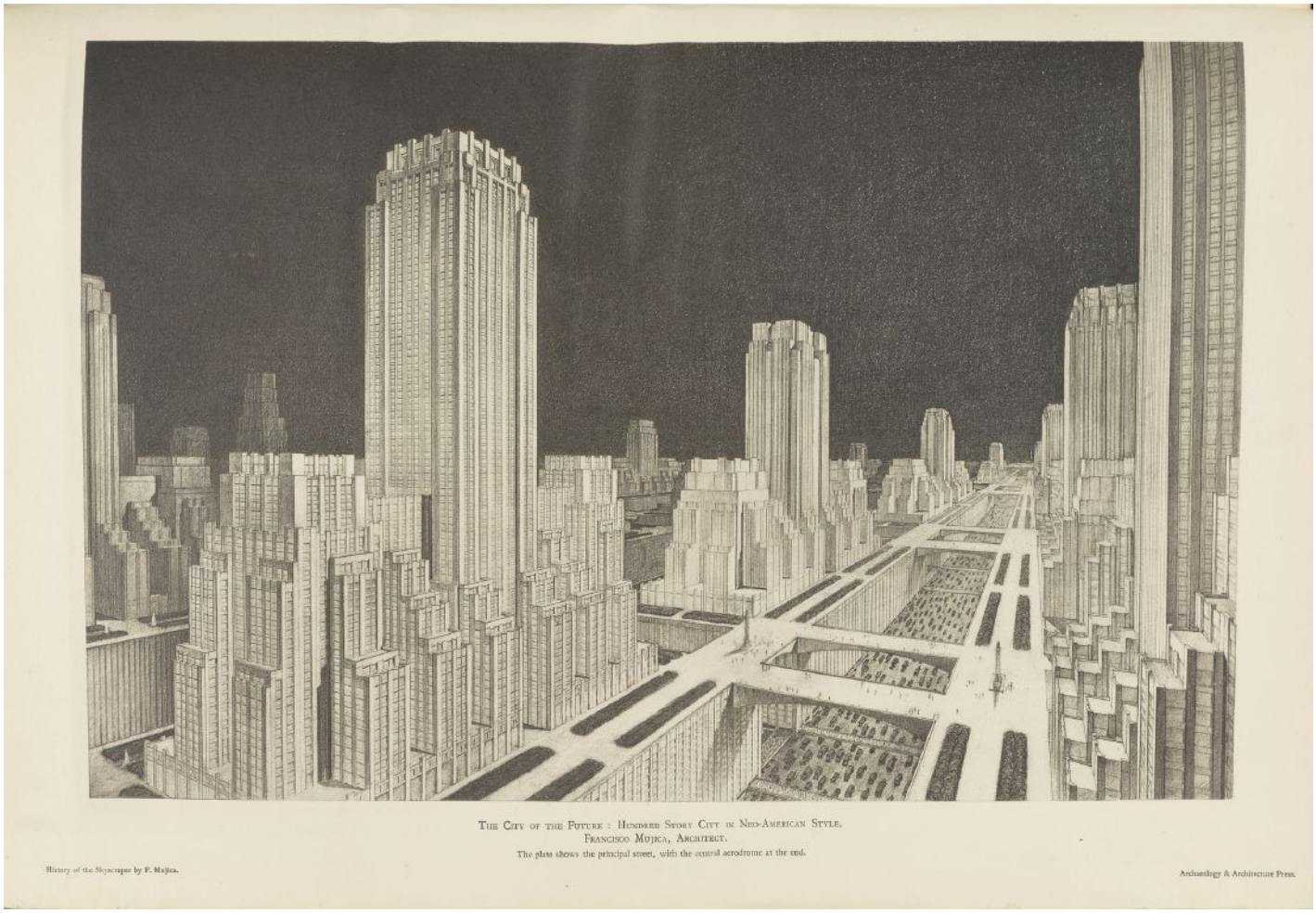


SAVE 10% ON 10 OR MORE HAMPTON BAY® IN-STOCK CABINETS

48-HOUR SHIPPING FOR SELECT FINISHES | 75 CABINET SIZES AND 9 FINISHES | THE LATEST COLORS FOR LESS

HOMEDEPOT.COM/HAMPTONBAYCABINETS

PRO THE HOME DEPOT



The Latin American Metropolis

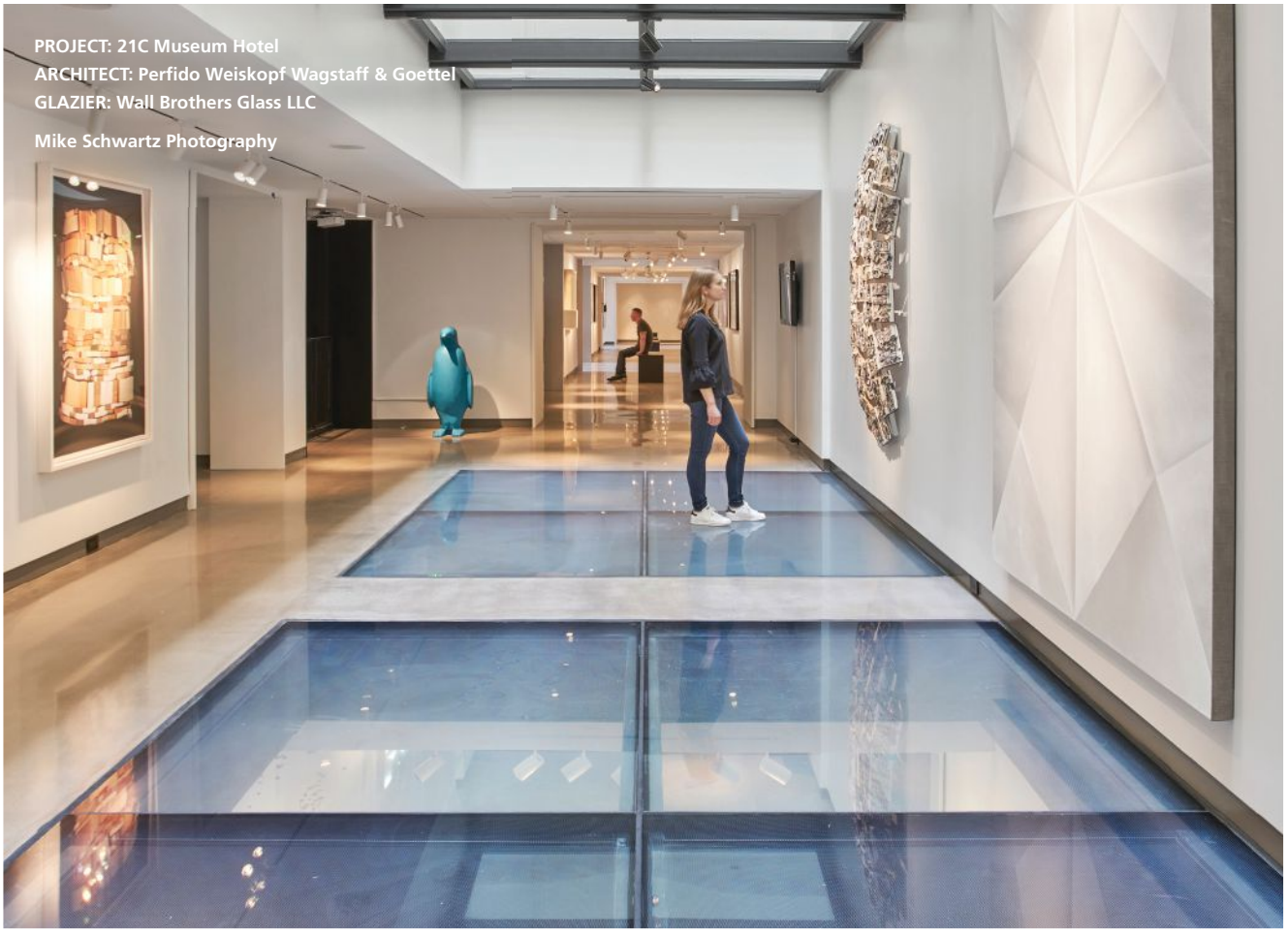
"The Metropolis in Latin America, 1830-1930," opening Sept. 16 at Los Angeles' Getty Research Institute, chronicles the development of six capital cities south of the border: Buenos Aires, Argentina; Havana; Lima, Peru; Mexico City; Rio de Janeiro; and Santiago, Chile. Through maps, photographs, plans, and prints, the show examines how the colonial city, originally shaped by Spanish and Portuguese regulations, developed during the republican era in response to industrialization, indigenous revivals, and other pressures. Objects on view include Francisco Mujica's *History of the Skyscraper* (1929, above). —CHELSEA BLAHUT

> *Read more about "The Metropolis in Latin America, 1830-1930" at bit.ly/GettyExhibition.*

INTRODUCING THE

CLEAR SOLUTION™

FOR FIRE RESISTIVE FLOORS



NEW! **GPX FIREFLOOR SYSTEM BY SAFTIFIRST**

Patent Pending

- **USA-made, *2-Hour* Fire Resistive Floor System with the *largest individual glass sizes*.**
- **Modular *top-loaded fire resistive floor assembly* for easy installation.**
- **Can be used in interior and exterior applications with *multiple glass make-ups and frame finishes*.**

For more information on the GPX FIREFLOOR SYSTEM and our complete line of fire rated glass and framing products, visit **www.safti.com** or call us toll-free at **888.653.3333**.

www.safti.com
888.653.3333

SAFTIFIRST™
SAFETY AND FIRE TECHNOLOGY INC.

Intertek CLASSIFIED UL USA Made


Does your steel building soar above the rest?
Then give it wings! Enter the 2018 IDEAS² Awards competition for excellence in building design using structural steel.
Entry deadline is October 6.
www.aisc.org/ideas2
AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISC
FOUNDED 1921
There's always a solution in steel.
American Institute of Steel Construction
312.670.2400
www.aisc.org
2017 IDEAS² Award recipient | Austin-Bergstrom International Airport East Terminal Checkpoint | Photo: Joel Blok

Service, availability and trust. Now in a fire wall hanger.

Introducing the Simpson Strong-Tie® DG fire wall hanger that installs before the drywall.

Designed for floor trusses, I-joists and 2x sawn lumber, DG fire wall hangers are tested and approved for two-hour fire-rated wall assemblies and feature a recognized fire test listing in Intertek's product directory. This new fire wall hanger meets code and is backed by our engineering, testing, and prompt delivery.

To learn more, visit **go.strongtie.com/firewallsolutions** or call us at (800) 999-5099.

SIMPSON Strong-Tie®

Best Practices: The Hidden Costs of Hiring

TEXT BY NATE BERG

Hiring isn't free. The costs associated with things like advertising job openings, dealing with recruiters, and the time that employees spend reviewing and interviewing candidates can add up fast. Below, researchers and practitioners discuss the benefits of establishing a hiring budget.

Know Average Costs

In 2017, Fayetteville, Ark.–based business consultancy Zweig Group conducted a hiring spending survey of architecture, engineering, planning, and environmental consulting firms and found that fewer than one-third have a budget for human resources (HR) and recruiting, even though the average cost of hiring a new employee for an architecture firm is $4,454, according to the survey. "A lot of firms don't know these numbers," says Randy Wilburn, Zweig's director of recruiting strategy.

> "We talk about where is our cost per hire now, how much have we spent this year compared to last year. It's all relevant."
>
> —Tina Kueter, director of human resources, Shive-Hattery

Wilburn says hiring usually takes between 30 and 60 days, and the typical $4,454 per hire is an industry average that can climb much higher depending on the position being filled. And hiring is almost always happening, especially at bigger firms. Wilburn estimates that, at the industry's average annual turnover rate of roughly 10 percent, a 200-person firm that wants to grow by 15 percent annually could be spending more than $200,000 a year on hiring alone.

Track Your Spending

Wilburn recommends that, regardless of its size, a firm pay more attention to how much it spends on staff time for its HR department (or, more likely, its HR person) or on the outside recruiters that many firms rely on to do the time-intensive job of finding good candidates. Tracking spending in these two categories alone could help firms understand how much their hiring costs are and how to budget for them. Wilburn also suggests tracking expenses for other parts of the process, including advertising, promotional recruitment materials, travel, interview training for recruitment employees, and relocation packages offered to new hires.

To keep the costs of hiring under control, leaders at Shive-Hattery Architecture + Engineering—a 400-person firm with seven offices in Iowa, Illinois, and Indiana—meet monthly to discuss business operations, and hiring and recruitment costs are included in a regular report.

"We track it very closely," says director of human resources Tina Kueter. "We talk about where is our cost per hire now, how much have we spent this year compared to last year. It's all relevant."

Create a Protocol

To ensure that the costs associated with turnover and hiring are manageable, Kueter says it's important to have a system. Shive-Hattery first identifies the specific needs of the office and then leadership meets to decide where to look to fill that need. Then the job opening is posted and the firm's in-house recruiter starts contacting potential candidates. Once candidates have been narrowed down, they're called in for two interviews—one technical, the other to gauge the cultural fit. Afterwards, human resources, the recruiter, and the firm's leaders hold a formal roundtable discussion on the candidates and make their selection.

"There may be outliers with certain candidates where you might handle things a little bit different," Kueter says. "But fundamentally we stay with our process." This helps to prevent any accusations of prejudice, but also helps keep costs under control. Kueter estimates the firm's cost per hire at just over $3,700 for 2017.

Not all firms need to systematize their hiring to such a degree, but Wilburn argues that paying more attention to the cost and process of hiring is part of becoming a better business—and a better place to work. "We're dealing with a finite supply of human resources. Recruiting and, more importantly, retention is one of the most important issues in the design space," Wilburn says. "It's important for firms to go that extra mile."

> *To learn more about creating a hiring budget, visit bit.ly/ARHiringBudget.*

Question Conventional Boundaries

NanaWall Opening Glass Walls

Engineered to perform in the toughest environments while opening and closing with ease.

- **Durable:** Entrance door panels tested for 500,000 cycles
- **Efficient:** Keeps extreme weather on the outside when closed
- **Secure:** Multipoint tamper-resistant locking panels close securely
- **Resistant:** Benefit from high wind load and water infiltration performance

Explore our opening glass wall product families:

Folding Sliding Frameless

Showrooms Nationwide
Visit NanaWall.com
800 873 5673

NanaWall®
Engineering the Exceptional

DELTA®

HIGH PERFORMANCE AIR & MOISTURE BARRIERS

DÖRKEN

Torrential downpours. Tropical cyclones. Tight budgets.

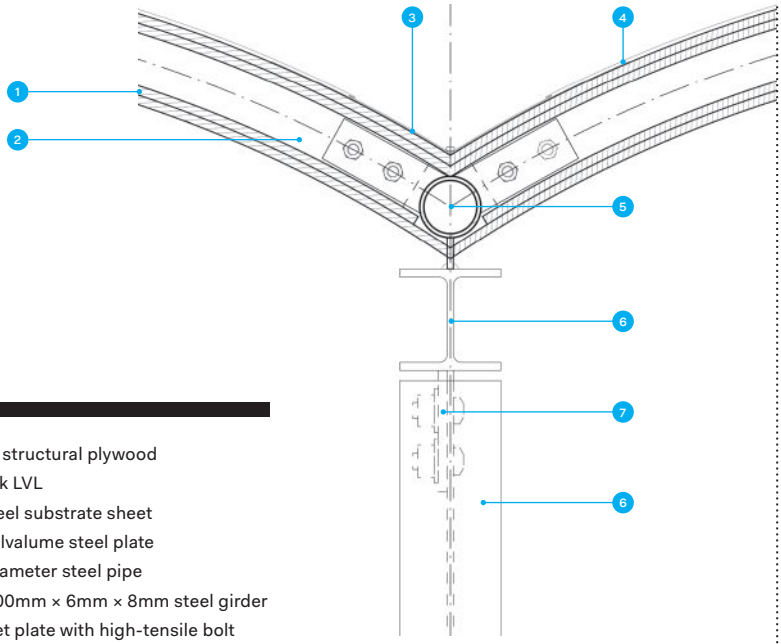
We protect your buildings from the world's toughest challenges.

We've been making protective barriers for buildings all over the world for 125 years. And we know just what it takes to protect your buildings from every kind of weather imaginable – and with every kind of budget. Don't take chances. With DELTA® air and moisture barriers, you can count on a perfect seal every time. So your buildings last longer, use less energy, and stay dry.

No one knows protection like we know protection. Visit dorken.com

Detail: Toranoko Nursery LVL Roof

TEXT BY TIMOTHY A. SCHULER



1. 9mm-thick structural plywood
2. 50mm-thick LVL
3. 0.35mm steel substrate sheet
4. 0.35mm galvalume steel plate
5. 60.5mm-diameter steel pipe
6. 100mm × 100mm × 6mm × 8mm steel girder
7. 9mm gusset plate with high-tensile bolt

SUZUKI KENICHI

Like artist Katsushika Hokusai and his famous woodblock prints, Takashige Yamashita's first project under his own name is inspired by views of Mount Fuji. The project, a nursery (i.e., day care) in the small town of Fujikawaguchiko, is for a client that also owns and operates several assisted-living facilities on the site. The client hoped the nursery could double as a community gathering place and organized a design competition in 2015. Takashige, who opened Takashige Yamashita Office in Tokyo the same year, won the competition with a single-story building featuring a curved timber roof that billows like a sheet on a clothesline.

For the roof, Takashige modeled the curvature of each section, first with a paper model, then in Rhino 3D. The final structure consists of two layers of structural plywood that sandwich a series of curved laminated veneer lumber (LVL) ribs. The ribs were cut to specified radii by CNC machines out of 2-inch-thick LVL panels and attach to portal frames via a 2-inch-round steel pipe with welded steel plates. For longer spans, the ribs are spaced at roughly 1 foot; for shorter spans, 2 feet was sufficient. The roof's profile measures just 3.5 inches deep.

With so many structural connections, a number of adjustments had to be made on site. "It didn't really go as we imagined," Takashige says. Despite the extra work, Takashige admits he enjoyed the process. It gave him a sense of satisfaction, he says, working directly with the wood as does a furniture maker.

> *To learn more about the conceptualization and construction of the Toranoko Nursery roof, visit bit.ly/ARToranokoRoof.*

65th annual Progressive Architecture Awards

2018 CALL FOR ENTRIES

Are you designing the next Blur Building? The Progressive Architecture Awards have a storied legacy of awarding projects for their forward-looking vision. In many cases, the P/A recognition moved these projects from on-the-boards to completion. What will you build, and what will your legacy be? Enter the 65th Progressive Architecture Awards today!

DETAILS

Projects must have a client and a completion date after January 1, 2018. Judging will take place in November 2017. Winners will be notified in December 2017, published in the February 2018 issue of ARCHITECT, and honored at a ceremony in New York. For more information and rules and regulations, visit paawards.com.

HOW TO ENTER

SUBMIT YOUR WORK AT paawards.com

QUESTIONS?

EMAIL paawards@architectmagazine.com

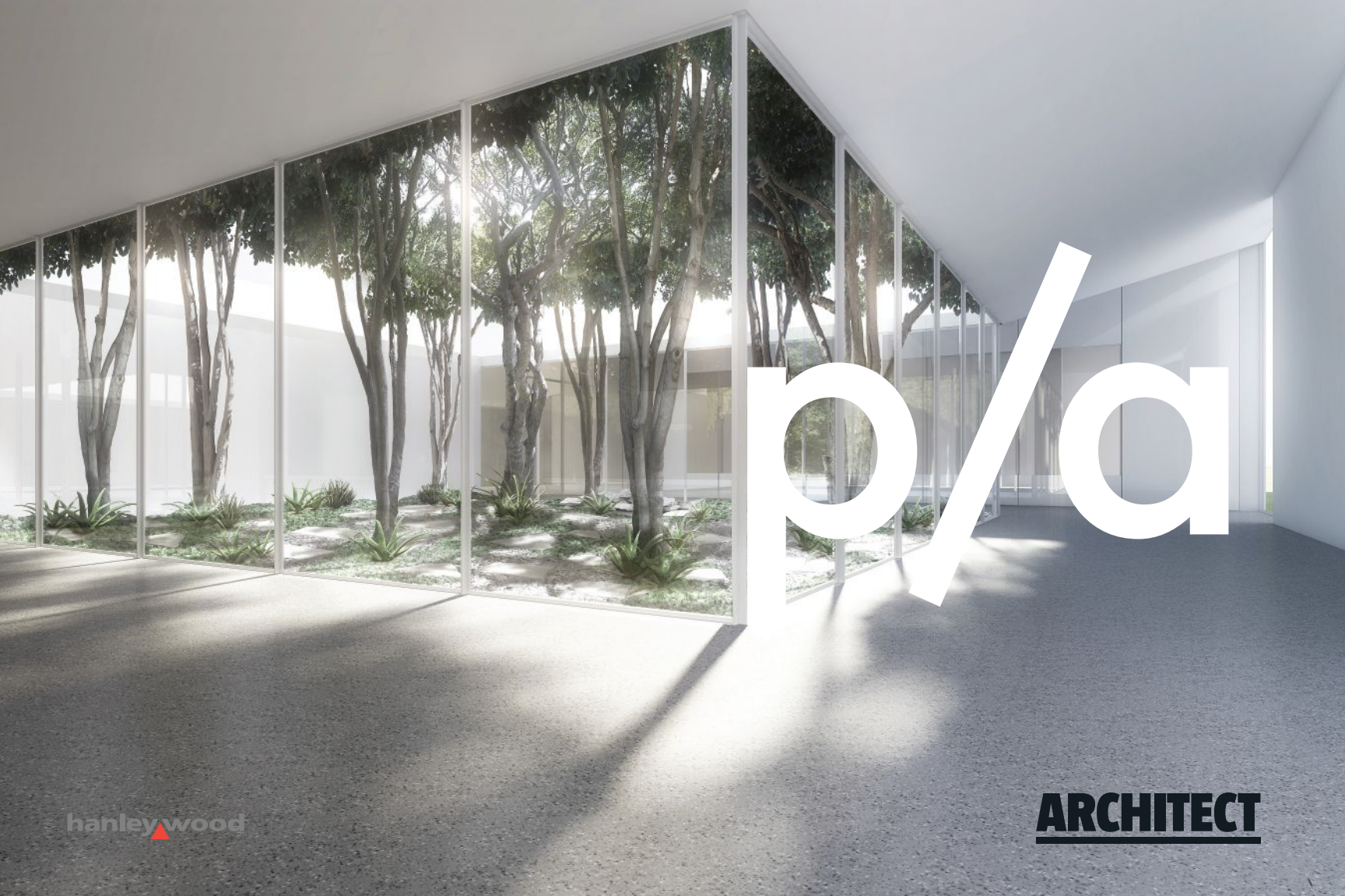
FEES

SINGLE ENTRY $195
ADDITIONAL ENTRIES $150
LATE FEE $50

DEADLINES

REGULAR October 27, 2017
LATE November 3, 2017 (Will include a late fee of $50 / entry)

2017 WINNER THE MENIL DRAWING INSTITUTE BY JOHNSTON MARKLEE



hanley wood

ARCHITECT

The prospect of double-podium projects like WREN spreading throughout southern California excites Cobo and Zapata. "New code language allowing multiple podium levels with Type III wood construction allows us to maximize the density and speed of wood construction," observes Cobo. For developers, that represents "bonus density" within Type III construction. For city leaders, it represents the possibility of safe, new housing.

WOOD: MULTIFAMILY DENSITY WITH TENANT-WINNING STYLING

It's humbling when the architect's vision helps rewrite a neighborhood's narrative. The $144 million WREN multifamily project in L.A.'s fast-rising South Park district does just that through thoughtful innovation, commercial discipline, and the magic of a remarkably nimble building material … wood.

Last June a new chapter for Los Angeles' fast-rising South Park district was delivered when a $144 million, 362-unit multifamily community called WREN warmly greeted its first residents.

The glittering pair of seven-story buildings transform the skyline along Pico Boulevard through a series of innovations, including the city's first Type III double-podium design. The project is earning rave reviews from the owner, tenants, city officials, and the designer community.

WREN launched a six-building, $1.2 billion South Park community that will ultimately add over 2,000 rental units to the city's housing stock. "The owner has big plans. WREN brings the first phase of that vision to market quickly," explains Matthew Cobo, AIA, associate principal of Togawa Smith Martin (TSM). TSM is an L.A.-based architect firm specializing in West Coast multifamily projects.

Double-Podium Breakthrough

The TSM design team faced the challenge of making a signature design statement that met the owner's 195 units/acre density requirement. "We had to figure out how to hit that density within an 85 foot height," Cobo says. They accomplished it through an innovative double-podium design supporting five levels of wood-framed structure, utilizing what is now a city of Los Angeles standard code modification.

The building will be protected by a full NFPA 13 fire sprinkler system throughout the entire project. The wood levels above the podium are split into five zones with 3-hour fire walls. By providing the sprinkler system, the wood portion of the building was able to increase in height from four to five stories.

"The structural engineers are able to do a lot of things with wood that they can't do with other materials," says Matt Cobo, AIA, associate principal of Togawa Smith Martin, project architect. "Wood gives us lots of flexibility. We're able to do more things with exterior wall insulation and corridor wall acoustics because of wood. The owner gets a maximum return from the space. We utilize every square foot we can. The efficiencies of leasable to overall square footage in this project were greater than 85 percent, which is a very good number."

Density wasn't the only challenge. Because of site size and shape, the design necessitated deeper interlocking units that were designed to showcase larger windows. Larger windows were a desired feature because typical urban in-fill projects are often shaded by existing structures. Fortunately, WREN has open-sky access. The TSM design team was determined to make the most of this property attribute with expansive windows.

Design Advantage

The challenge for wood framed buildings in high seismic zones is how to provide large glass areas and still provide sufficient shear walls. To achieve this, the team worked with the structural engineer to determine the minimal length of shear wall required at each floor. Any area not required for shear wall was used for windows. The structural characteristics of wood were blended to create an aesthetically pleasing open grid on the exterior of the building.

But larger window openings add structural complexity. Wood proved to be the architect's best friend in conversations with project engineers. Jay Zapata, AIA, LEED AP BD+C and TSM's architect/job captain on the project, says "Wood is a forgiving material, especially during the construction phase, since it allowed us to quickly resolve unexpected issues in the field without compromising our original design. We were able to negotiate lengths and locations of shear panels with our structural engineer to quickly direct our general contractor and their subs. Wood is a material that lets you achieve your design goals without affecting the budget or the time schedule." Zapata says.

Meeting code proved to be an exceptionally positive experience. "The city was great," Cobo reports. "They have a developer services group that brings together many city departments. Code compliance wasn't an issue."

Lease-Up Excitement

Is southern California leading the way in multifamily double-podium design and innovation? There's no shortage of opportunity and belief. "We are very proud of this building. It is leading a new type of design in the multifamily sector. With the adoption of the 2015 International Building Code, multiple podium levels are now acceptable without code modifications. We are excited about the expansion of this concept as we can now offer our clients additional density that was not achievable before," Zapata says.

As for WREN, the owner couldn't be happier. The amenity-filled complex was nearly 20 percent leased at opening. Full occupancy is expected within a year.

Owner/Developer: Mack Urban in partnership with AECOM Capital and Capri Capital

Architect: Togawa Smith Martin

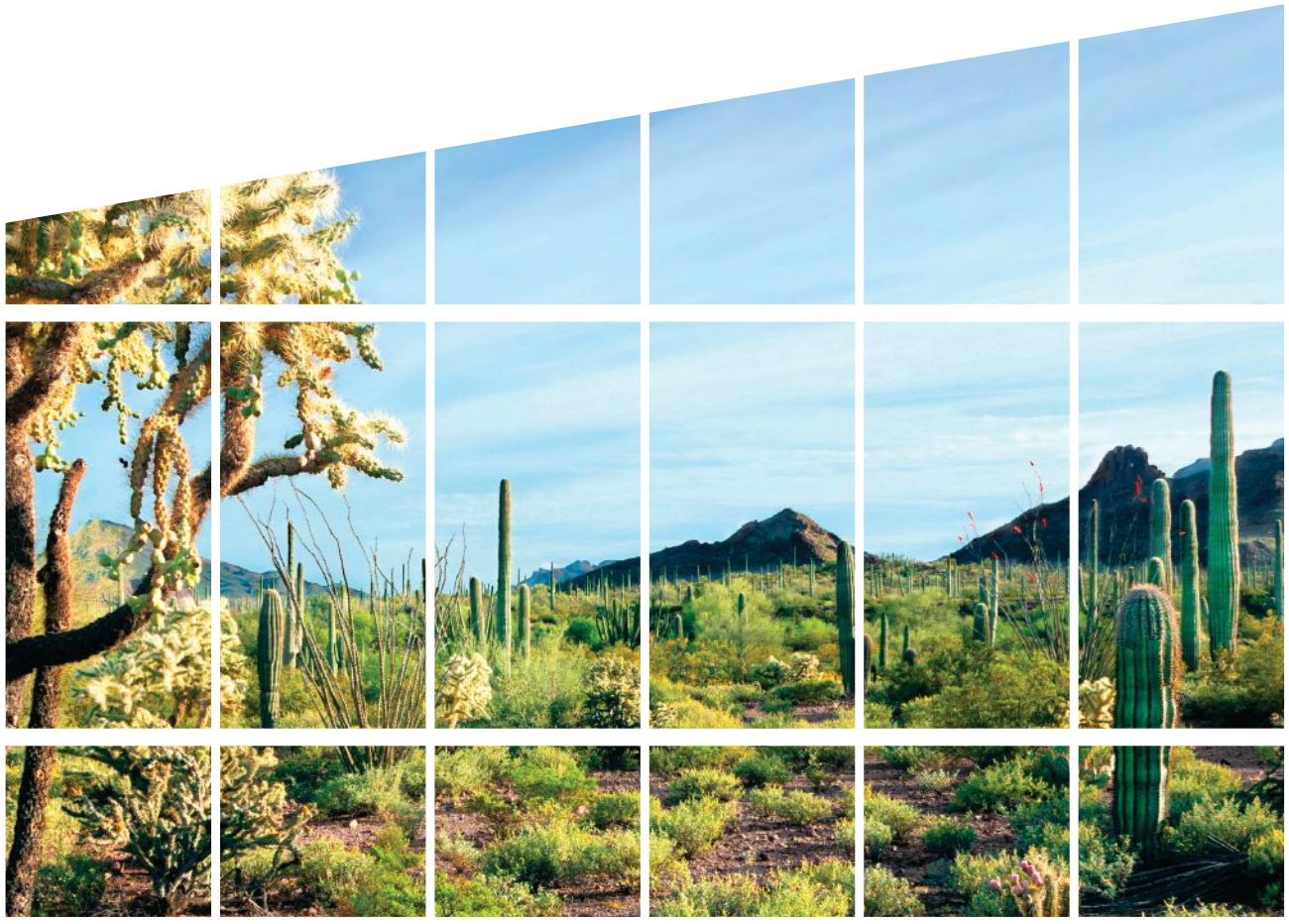
Structural: Englekirk

MEP: Donald F. Dickerson Associates

Civil Engineer: KPFF

General Contractor: Tishman/Morley Builders

Photography: Kevin Korczyk / Jeremy Samuelson



THINNER LINES ALLOW THICKER SCENERY. When you're framing a spectacular view you need windows that rise to the occasion. Narrower profiles, special shapes, smarter glass. More design flexibility to broaden your horizons. See the latest evolution in windows at weathershield.com.

WEATHER SHIELD®

WINDOWS & DOORS

ARCHITECT

The Journal of the American Institute of Architects

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

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

valspar

hanleywood

Next Progressives: Paul Preissner Architects

EDITED BY KATHARINE KEANE

Location:
Chicago

Year founded:
2007

Firm leadership:
Paul Preissner, AIA

Education:
B.Arch., University of Illinois; M.Arch., Columbia University Graduate School of Architecture, Planning and Preservation

Firm size:
One to four people

Experience:
Philip Johnson Alan Ritchie Architects; Eisenman Architects; Skidmore, Owings & Merrill; Wood+Zapata (now dissolved)

Mission:
I believe the primary purpose of architecture is to make the ordinary seem strange. It's the architect's job to help someone reflect on their space and what it means. As such, I think my work and that of my office is to try and make projects that seem knowable but also feel a bit out of place in their environments and encourage some kind of mediation about why things are the way they are in the world as we've made it.

Origin of firm name:
My parents came up with my name, and while I used to think it was fun to have some band-name-type name for an office, now I think it just makes the most sense to stand behind one's work with your own name.

Paul Preissner

Memorable learning experience:
When I decided to quit working for Peter Eisenman, FAIA, I gave him six weeks notice because I really liked the office and its work, for all its flaws. On my last day, Peter yelled at me for leaving because he had thought things "had changed." The office manager had curiously thrown a rare party the night before and left beer bottles around the office, which Peter interpreted as me having a going-away party. I had to listen to him yell at me for 20 minutes before I just decided to take leave of the situation. The elevator was right across from his desk, but I was forced to wait for what felt like a very long time to take exit from an angry man staring at me.

I think I learned that there are a lot of bad people who despite their work (or because of it) feel like they own the lives of those who care enough about their craft to offer their labor.

Favorite project:
The house I'm working on now with my wife for our home in Oak Park. It's a renovation of a pretty nice but pretty messed up English Tudor house from 1934 that seems to more or less never have been updated since it was built, other than lot of paint. So, we have had to replace even the sanitary waste lines, which is a bit gross, but other than money, it's going well. We just want to make it nice and a bit weird, since we expect to live in it for a very long time.

Second favorite project:
I don't know. I really like and dislike all of them equally. I see all the things I didn't do right in everything that I've done.

Modern-day design hero:
Kazuyo Sejima. I think she's the first contemporary architect through whom I saw that architecture could be weird and important and weak and profound and personal and significant without being heroic.

Skills to master:
Speaking Spanish.

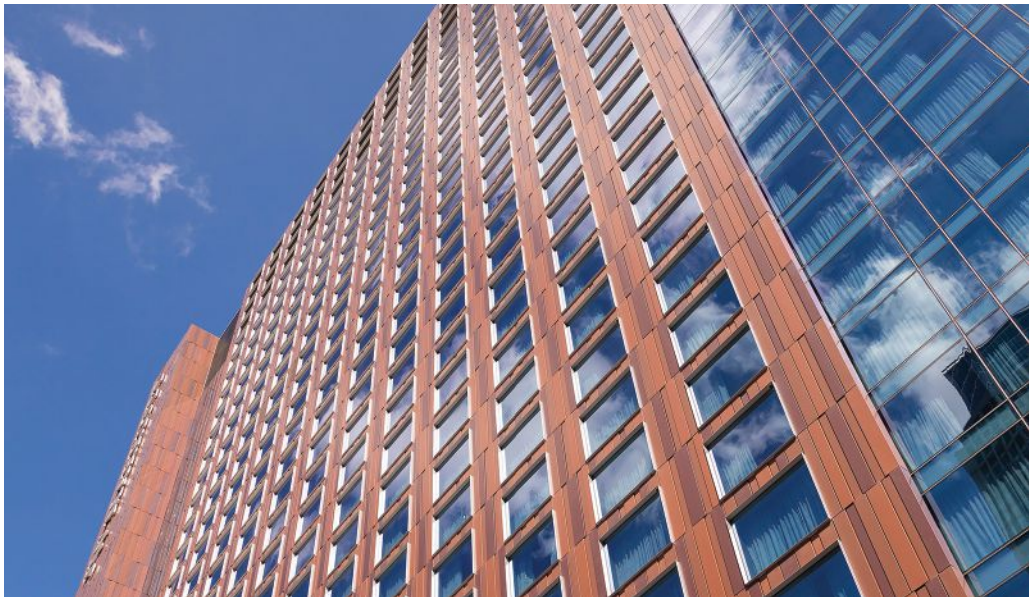
Vice:
I probably buy and subscribe to too many magazines.

CHRIS STRONG

> *To learn more about Paul Preissner Architects, visit bit.ly/ARPreissner.*

WEATHERED STEEL OR JUST AN ILLUSION? COLOR IS THE KEY

The New 34-Story **JW Marriott Hotel** Pays Homage to Austin in a Surprising Way



Unmatched Experience

Barrel Brown, Fudge, and Mustang are the whimsical names of three custom colors currently wowing Austin, Texas residents and visitors as they gaze upon the city's largest and arguably grandest hotel.

What they see when they look up at the 34-story western façade of the new 1.2 million sq.ft., 1,012-room **JW Marriott Convention Center Hotel** evokes the weatherized beauty of the COR-TEN steel bridges that dot greater Austin. Interestingly, this towering homage to Austin aesthetic also comes with a secret: It's not all that it seems to be.

Visual Magic

The mottled rustic appearance of weathered steel, so coveted in high-end building construction, is actually a deft variegated pattern of coated Galvalume steel panels. The architectural artistry of choreographing assorted panel depths, widths, and colors deceives the eye into believing it's prized COR-TEN steel.

How this winning effect was achieved with owner-friendly economy is a tribute to vision, color science, and hard work.

"We didn't want the building to feel like it could have been built anywhere. We wanted it to honor the unique appeal of the Austin environment," reflects architect Eddie Abeyta, AIA, LEED AP, principal and commercial design director of Dallas-based HKS Architects, the project designers. Yet, achieving that appeal through weathered steel proved daunting, especially on a limited budget.

Enter a metal wall design company called ProCLAD Inc. of Noblesville, Indiana. Could more affordable Galvalume panels be installed in such a way they would mimic the deep mottled rusted look of COR-TEN steel? *'Why not'* reasoned Craig Caudill, ProCLAD's executive vice president. Coating the panels with colors that ranged from dark to light might do the trick.

Unique Palette? Just Ask

The pressure was now on an architectural coatings manufacturer to deliver high-performance metal coatings that meet the desired aesthetic. For that, the project team turned to a trusted name, Valspar.

The challenge wasn't easy, even for a coating company long known for architectural excellence across hundreds of signature building projects worldwide. The task was twofold. First, Valspar had to devise a color palette that presented strong, viable candidates for the HKS team to select from. Second, they had to do it fast. Valspar had less than two weeks to create coatings for four-foot by eight-foot wall mock-ups that ProCLAD planned to present to HKS in their parking lot.

Panel Pixilation

"I admit we were a bit skeptical coatings would replicate weathered steel," recalls Abeyta. "We wanted to be very subtle with the pixilation of the panels. At a distance the colors would soften and coalesce into a pleasing interpretation of weathered steel."

Nearly 20 color options were considered. The winning three proved to be a magical combination. Just as important, the Valspar Fluropon coatings will maintain the hotel's desired look for many years. Fluropon 70% PVDF coatings are known for their lasting durability, meeting or exceeding the highest industry standards for color retention, and resistance to chalking and chemical degradation.

"Ecstatic"

The JW Marriott opened to the public on February 13, 2015. The owner's reaction was "ecstatic," according to Abeyta. "I believe it turned out even better than they ever imagined."

The public reaction was positive as well. On opening day the hotel was pre-booked for 520,000 room nights through 2021.

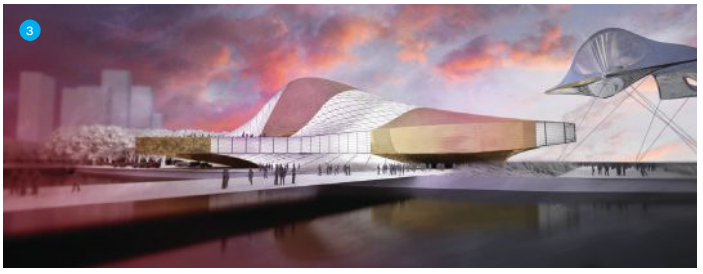
Owner White Lodging Services, Corp., Merrillville, Ind.
Architect HKS, Inc., Dallas
General Contractors DPR Construction, Austin, and Hunt Construction Group, Indianapolis
Curtainwall Applicator Bonnell Aluminum, Newnan, Ga.
Mock-up Applicator Western Extrusion, Carrollton, Tex.
Fabricator/Installer ProCLAD Inc., Noblesville, Ind.
Curtainwall Win-Con Enterprises Inc., New Braunfels, Tex.
Panel Supplier McElroy Metal, Bossier City, La.

---

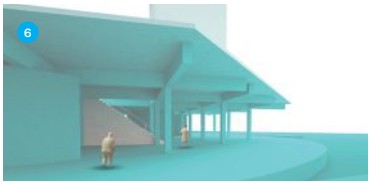
valspar®

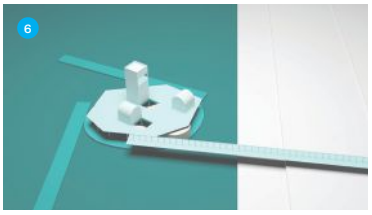
As one of the leading manufacturers of architectural metal coatings in the world, we bring a proud history of innovation to the coatings industry. With an enduring commitment to durability and an ever-expanding palette of color, Valspar offers unlimited design freedom to countless industries, projects and locations.

Next Progressives:
Paul Preissner Architects



1–3: COURTESY PAUL PREISSNER; 4: BRUCE DAMONTE





5–7: COURTESY PAUL PREISSNER

1. Preissner completely restored both the interior and exterior of a four-unit brick apartment building in the McKinley Park neighborhood of Chicago from 1894, which now features whimsical exterior lights and a horizontal gradient of black paint. **2.** This irregular Tinley Park, Ill., multi-use complex is comprised of three courtyard buildings that include retail and residential space with varying layouts to create what Preissner calls "a much less monolithic chunk on the Earth." **3.** Preissner's cantilevered structure featuring an elevated courtyard and geometric exterior pattern is a proposal for the Busan Opera House in South Korea. **4.** Part of the 2016 Chicago Architecture Biennial, the powder blue Summer Vault is a freestanding geometric kiosk in Millennium Park featuring a 12-foot-diameter barrel vault, which Preissner designed in collaboration with Denver-based Independent Architecture. It has since been relocated to Rainbow Park Beach in Chicago. **5.** Preissner's submission for an art complex in Seoul's Pyeongchang-Dong district includes multiple cubic structures for studio, exhibition, recreational, and social spaces across an 53,820-square-foot campus. **6.** A proposal for a floating passenger ferry terminal on the Han River in South Korea. **7.** Also designed with Independent Architecture, this temporary, galvalume-coated, prefabricated steel structure served as an event stage for the 2013 Biennial of the Americas event in Denver; it received a 2014 AIA Chicago Small Project Honor Award.

Not 7:47. Or 7:49. And definitely not Malibu.
Because meaningful inspiration isn't arbitrary.
That's why we make Fluropon® 70% PVDF coatings
obsessively precise and relentlessly durable.
So every vision shines exactly as imagined.

REALIZE YOUR INSPIRATION
ColorObsessed.com

valspar

ARCHITECTURAL METAL COATINGS

BUILD.

With SUPA Doors MDF Collection,
you can build more.

VT INDUSTRIES Architectural Wood Doors

VTDoors.com 1-800-827-1615 (ext. 10512)

FSC www.fsc.org FSC® C005590

The mark of responsible forestry

Products: How to Specify a Direct/Indirect Luminaire

TEXT BY SELIN ASHABOGLU

Technological fads come and go, but one main objective will always remain true when specifying a fixture: achieving light quality. In commercial spaces, direct/indirect luminaires are a mainstay due to their versatile illumination capabilities. Here are some tips for selecting and specifying these fixtures.

Fold, Fluxwerx *fluxwerx.com*

The Basics

Direct/Indirect fixtures can be fitted with just an uplight or just a downlight distribution, or a combination of both; the upward (indirect) light can provide a softer ambient glow, while the downward (direct) light provides general illumination for the work plane. Used independently, indirect lighting can leave "the space [feeling] dull, like being outside with a gray sky, because nothing is punched up or highlighted," says Michael Hennes, an associate principal at Cline Bettridge Bernstein Lighting Design in New York City. He also warns, "be careful that the direct component has good shielding so that it doesn't become glary."

Reflectance

To the lighting novice, ensuring that the fixture aesthetically coordinates with the interior design of a space may seem like the most important consideration, but it is vital to attend to the technical criteria of lighting as well, such as the reflectance level of a ceiling material, says Maureen Moran, principal at Washington, D.C.–based MCLA Architectural Lighting Design. "If [the ceiling] is white, then [there is] more contribution onto the work surface below," she says. "Dark, wood ceilings normally have a finish that will reflect the lens of the uplight, for a less desirable result." Ceiling height should also be accounted for—a narrow space between the fixture and ceiling could produce an unwanted beam reflection.

Light Distribution

Since direct/indirect fixtures can emit light both up and down at specific percentages, designers must find the right balance for appropriate distribution. "The indirect portion of the light distribution should be very wide in order to uplight the ceiling evenly," says Melanie Taylor, vice president of lighting design at the New York office of WSP. "The direct portion of the light distribution can be narrower in order to light the work plane below."

Price and Delivery

Because lighting manufacturers do not publish a price list for their products, and the lighting design budget is generally a percentage of the overall project cost (rather than a separate budget) it is often difficult to calculate what the final expense will be. When it comes to a project schedule, designers can usually expect a standard eight- to 12-week lead-time, Taylor says. However, for tight deadlines, most manufacturers have a quick-ship option to expedite the fixture assembly and shipping process, which can significantly reduce the timeline to as little as five days with, and 10 days without, a surcharge. It is recommended that designers check directly with the specific manufacturer.

Operations

Ease of maintenance is a vital post-occupancy issue to consider ahead of time. "Although LEDs have a very long life, drivers can fail and LEDs can have a catastrophic failure," Hennes says. Issues regarding the compatibility of luminaire components have been highlighted because of LED technology, so the different life spans and warranty problems related to the driver and the light source must be kept in mind.

Manufacturers do not always include details on maintenance for their products, Hennes adds, so it is often up to the designer to dig deeper for their client. Though the long-term maintenance of the luminaire will fall to a facility manager, it's the lighting designer's responsibility to specify a product that can maintain technical performance while staying true to the design integrity of a lighting scheme.

> *To read more about specifying a direct/indirect luminaire, visit bit.ly/SpecifyingDirectIndirect.*

Studio E Architects
UC San Diego Athena Parking Structure
La Jolla, California
3/8" 16 Ga. Stainless Steel Fabricoil® Pipeline Attachment System

Fabricoil®

Stephen Whalen Photography

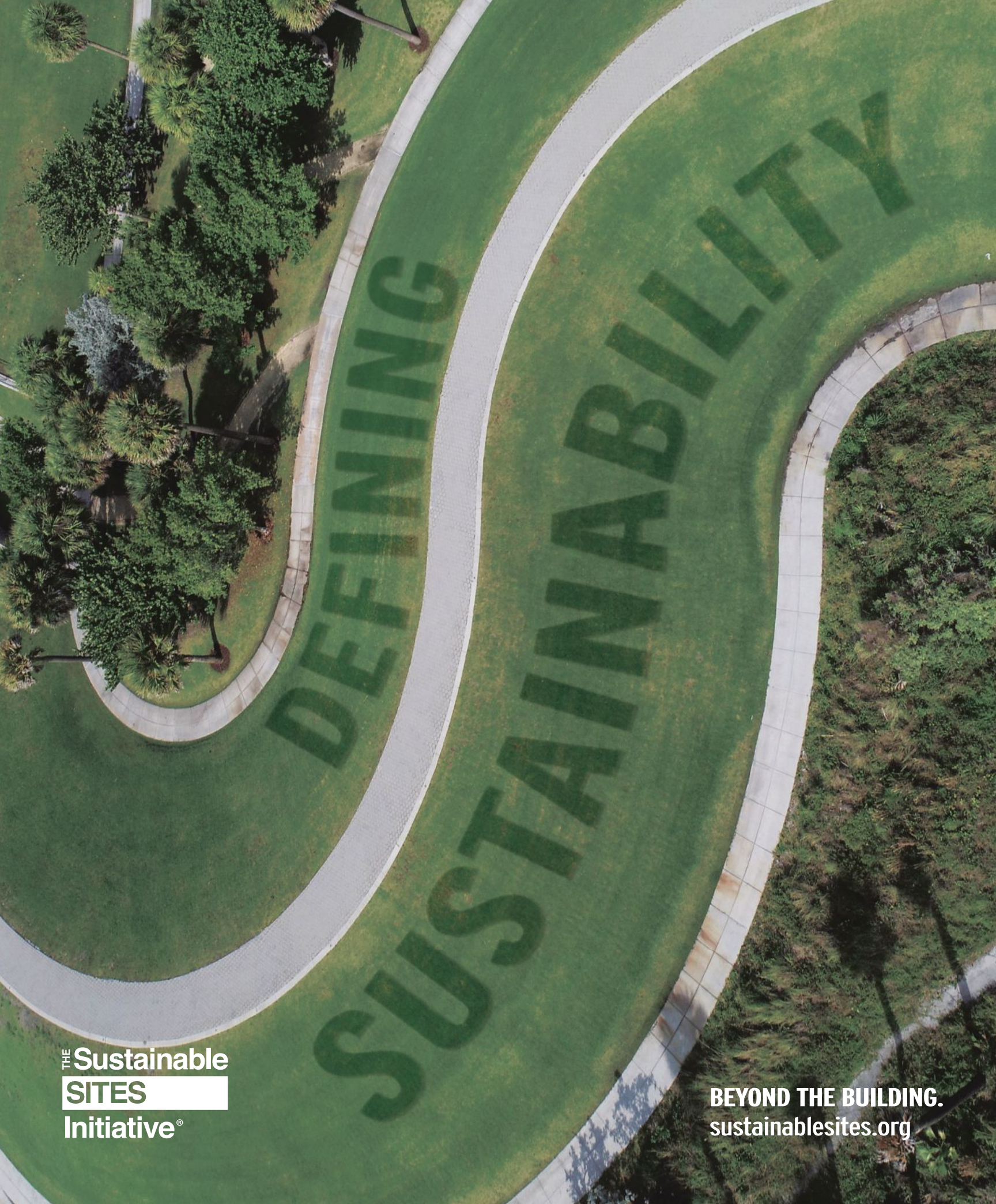
"To define a human-scale pedestrian walkway on the edge of a 7 story parking structure, we knew an overhead awning was a good solution. We selected Fabricoil® as a durable exterior material with qualities of lightness and airiness that juxtapose with the heavy concrete structure. The stainless steel weave shimmers in the sunlight as it effortlessly drapes between the galvanized awning supports. It creates an overhead rhythm and gives definition to the walkway as a place for people, not cars."

Maxine Ward, AIA LEED AP Associate
Studio E Architects

Pipeline Attachment System

CASCADE architectural
a division of Cascade Coil Drapery, Inc.

800.999.2645
fabricoil.com
cascadearchitectural.com



THE Sustainable SITES Initiative®

BEYOND THE BUILDING.
sustainablesites.org

NEW BLUE.
NEW POSSIBILITIES.

New Guardian CrystalBlue™ is perfect for contemporary structures that are big on light, smart on energy. Our clients prefer its light blue color, and CrystalBlue pairs perfectly with the SunGuard® coatings we specify."

Paulo Perkins, GraceHebert Architects

BUILD WITH LIGHT®

Order a sample at: GuardianGlass.com/**commercial**, or call 1.866.GuardSG (866.482.7374)

GUARDIAN® SUNGUARD®

Presented by:

HIGH PERFORMANCE JOINT SEALANTS

UNDERSTANDING THE TECHNOLOGY AND SPECIFICATION CONSIDERATIONS

By Steven Reinstadtler, Construction Market Manager, Coatings, Adhesives and Sealants Covestro LLC Pittsburgh, Pa., U.S.A.

High performance joint sealants prevent fluids, like wind driven rain, and air from passing through a filled gap while staying adhered to a substrate that can move for environmental and structural reasons.

LEARNING OBJECTIVES

By the end of this educational unit you will be able to:

1. Understand the definition of sealants and related terms.
2. Review end use applications of high performance joint sealants.
3. Describe the different types of joint sealants and where they are used in the built environment.
4. Explore the different divisions in MasterSpec where joint sealants can be prescribed..

CONTINUING EDUCATION

AIA CREDIT: 1 LU
AIA COURSE NUMBER: AR092017-2

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/AR092017-2 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

INTRODUCTION TO JOINT SEALANTS

Every year, architects, engineers and specifiers are offered extensive learning units related to the latest siding, lighting and flooring product—some of the more sexy presentation topics. However, chemistry-dependent coatings and joint sealants courses are routinely requested by the specification community because these products can have a significant impact on the asset and building owner, but there is a lack of technical information available. For that reason, the architectural and engineering community has asked for more information that covers sealant terminology, attributes and properties of joint sealants, where and why they are most often used in the built environment, where joint sealants are prescribed in MasterSpec and what to consider when specifying them in the different applicable divisions of MasterSpec.

Definitions

There are many sealant types used in the built environment. First it is important to learn some of the basic terminology in this space in order to understand what a sealant is, and just as importantly, what it isn't.

A joint sealant, within the scope of the building and infrastructure area, is a material that fills a gap and prevents fluids, air or other materials from passing through the sealed area. It also has adequate adhesive and cohesive properties to form a seal and needs to be able to adhere and move with the substrate while remaining in place to keep the joint filled and sealed.

The terms 'sealant' and 'caulk' are often used interchangeably but there are differences between the two. As defined previously, a joint sealant has several desired properties related to flexibility, adhesion and cohesion in a moving joint. A caulk, however, is usually composed of a lower property compound, often a putty, with limited initial and long term compressive and elongation properties. Caulks are usually specified in a non-moving joint where the main purpose is to fill a gap or joint between two substrates. Anne Whitacre, Senior Architectural Specifications Writer at HOK, explained how she sees the differences: "For exterior fenestration or roofing applications where joints can see movement, water infiltration and weathering effects, I usually will specify a high performance joint sealant such as a silicone or polyurethane. For less critical, non-moving interior joints such as some of the openings covered by MasterSpec Division 08, a latex or acrylic caulk is adequate."

Another source of terminology confusion comes up when discussing the terms 'sealant' and 'sealer.' A sealer is usually a low viscosity

ASTM C 920 defines a joint sealant using several descriptor categories. For example, this sealant would be a Type S: Single component, Grade NS: Non-sag product.

liquid that is applied to a surface such as concrete to protect it from wear, chemical attack and staining. The sealer can penetrate into small voids in the concrete surface to reduce absorption of water and salts or form an impermeable layer or coating that prevents chemicals or staining agents from passing into the substrate.

Characterization

Within ASTM, there are two committees significantly involved with joint sealants: Committee C24 on Building Seals and Sealants and Committee E06 on Performance of Buildings. C24 has jurisdiction over standards specifically covering joint sealants. Familiar examples are specifications C 920 on Elastomeric Joint Sealants and C 834 on Latex Sealants. For the scope of this training, we will be focusing primarily on high performance joint sealants.

ASTM C 920 defines elastomeric joint sealants using terminology such as types, grades, classes and uses that are used in reference specifications as follows:

- Type S: Single component material
- Type M: Multi-component material
- Grade P: Pourable grade that can self-level
- Grade NS: Non-sag grade that is often used in vertical joints
- Class XX: Movement capability, expressed as a percent
- Class XX/YY: Movement capability, expressed as a percent in expansion/ contraction
- Exposure Use T: Can accept traffic
- Exposure Use NT: Non-traffic applications
- Substrate Use G: Glass
- Substrate Use M: Mortars
- Substrate Use A: Aluminum
- Substrate Use O: Other

ASTM C 920 includes additional standards used to characterize different types of sealants such as:

- Sealant hardness (ASTM C 661)
- Movement capability (ASTM C 719)
- Tack free time (ASTM C 679)
- Peel adhesion (ASTM C 794)

Two other joint sealant considerations that can affect long term performance is the stress relaxation properties and modulus of the compound. Stress relaxation is the ability of the sealant to elongate without imparting significant stress to the bond line on the substrate. Sealants that recover quickly and fully after being stretched usually are considered to have less stress relaxation than those that recover slower. For modulus, sealants can be grouped into three general categories:

High Modulus: typically used in glazing applications, non-moving joints

Medium Modulus: typically would cover most general purpose sealants used as an elastomeric joint sealant

Low Modulus: have a higher movement or elongation capability and reduce stress at the sealant bond line which accommodates more joint movement

END USE APPLICATIONS

There are several familiar end use applications for joint sealants in a building that have very different needs and therefore the sealants specified can vary greatly from application to application. Some typical joint sealant application areas include:

Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:

- Construction joints in cast-in-place concrete
- Joints between plant-precast architectural concrete
- Joints and sealant associated with exterior cladding
- Joints associated with aluminum trim and exterior envelope
- Perimeter joints between materials listed above
- Perimeter joints between materials listed above and frames of doors, windows and louvers
- Control and expansion joints in ceilings and other overhead surfaces

Exterior joints in the following horizontal traffic surfaces:

- Control and expansion joints in brick pavers
- Isolation and contraction joints in cast-in-place concrete slabs
- Joints between different materials listed above

Interior joints in the following vertical surfaces and horizontal non traffic surfaces:

- Control and expansion joints on exposed interior surfaces of exterior walls
- Perimeter joints of exterior openings where indicated
- Tile control and expansion joints
- Vertical joints on exposed surfaces of concrete walls
- Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances
- Joints between plumbing fixtures and adjoining walls, floors and counters

Interior joints in the following horizontal traffic surfaces:

- Isolation and saw-cut joints in poured-in-place concrete slabs
- Control and expansion joints in tile flooring

In all of these applications, there is a degree of expertise needed to understand how to correctly apply the myriad of joint sealant

Interior joints on horizontal surfaces that see traffic such as this decorative stained concrete floor can be sealed to make cleaning easier.

products to the different substrates. Wayne Belcher, consultant and estimator for Unipro out of Seahurst, WA, makes a living at doing just that. "More than just chemistry, ideally, the implementation of a sustainable sealant installation can benefit significantly from proper design assessment, sealant selection and synergy on the part of the construction team. The basic requirements for the installation of elastomeric sealants are ever-changing and increasing as new and remedial construction technologies expand," stated Belcher.

This is the reason why some architects and specifiers favor a one-sub approach for all of the sealant work on a project. Whitacre said that the general contractor encourages the trades to apply the sealant only for their specific area and that makes her nervous. "The preference is to have one sealant subcontractor perform all of the sealant installation for all the needed joint areas," explained Whitacre.

HIGH PERFORMANCE SEALANT TECHNOLOGY OVERVIEW

When considering high performance joint sealant technologies, there are several that make up the majority of products that are applied in the more challenging areas of the built environment. These are silicones, polyureas and polyurethanes. In some niche applications, such as uneven floor joints, an epoxy may also be used.

One component silicone sealant is often used on vertical exterior joints such as those around openings like curtain walls and windows.

Silicone

Silicone joint sealants are an inorganic material derived from a silicone polymer that is available primarily as a single component product.

Silicone inorganic sealants have good adhesion to ceramic and glass. They provide excellent weatherability and UV resistance and retain their physical properties well. They remain flexible long term and are therefore often specified in exterior fenestration applications like those in Division 08. Silicone based sealants have very good water resistance in vertical joints and are relatively surface moisture tolerant. Being a one component product, they can be applied with easy-to-use standard application tools.

One issue with silicone is the compatibility with other sealants and some substrates such as painted surfaces and wood—silicones generally adhere well to silicones. Also, silicones are not usually paintable and need to be sourced in a color compatible with the fenestration color palette. Suppliers usually have a limited list of color choices. Additionally, some architects and contractors prefer not to use clear silicone joint sealants since they have observed some yellowing of the clear versions. Silicone sealants usually exhibit lower abrasion and tear resistance which limits their use in traffic bearing exposed joint applications such as concrete floor joints. Finally, some silicone formulations contain products that can leach out during application and stain certain substrates such as brick, stone or concrete.

Two component polyurea based joint sealants are applied using specialized plural component equipment and cure quickly to reduce downtime.

Polyurea

Polyurea joint sealants are typically nearly 100% solids, depending on the formulation, are typically two-component, and rapidly cure to form a sealant with moderate elongation and high tensile strength.

There are two general types of polyurea sealants – aromatic and aliphatic. Aromatic polyurea joint sealants are often used in interior applications such as control, day or saw-cut joints. In many cases, the entire concrete floor surface and joints are then coated with an epoxy or polyurethane topcoat or the joint sealant is pigmented in a similar or complimentary color. Aliphatic polyurea joint sealants can be used in either interior or exterior application since they are formulated with light stable components. For example, some aliphatic based systems are formulated with polyaspartic resins, a technology used in high durability exterior protective and marine coatings.

The main advantage of a polyurea joint sealant is their fast cure. This allows for quick finishing by cutting them smooth and flush if needed in applications such as concrete joints in Divisions 03 and 32. Another advantage is the toughness, measured in tensile strength, and water, chemical, abrasion and tear resistance due to their reactive chemistry. These sealants can be rained on or walked on often within minutes of application and are relatively surface moisture tolerant.

Polyureas require plural component equipment that can be expensive and requires a specifically trained operator/contractor for application. Therefore, there is potential for an off-ratio mix if the equipment experiences issues. Also, aromatic polyurea sealants can yellow over time if exposed to UV light. Polyurea sealant products with lower elongation and higher hardness cannot accommodate high joint movement.

Polyurethane

During the late 1930's, Otto Bayer pioneered the chemistry of polyisocyanates, a technology that led to the advent of polyurethanes for a variety of applications. Due to their ability to vary physical properties such as hardness, elongation, abrasion resistance and modulus, polyurethanes are widely used in a variety of materials such as foams for building insulation and sealing, adhesives for construction and specialty applications, protective coatings for a variety of substrates, and a variety of sealants for OEM, general industrial and construction applications. Polyurethane joint sealants used in the building, infrastructure and architectural markets, which we are discussing here, fall under this category.

Polyurethanes are one of the most versatile polymer technologies and have found application in the infrastructure and construction protection markets because they provide a unique combination of flexibility and weatherability, as well as chemical and abrasion resistance. These joint sealants also provide reduced VOC emissions, the ability to adjust modulus via formulation, and superior adhesion. A well formulated polyurethane joint sealant provides the advantage of water resistance, long term flexibility and a higher level of performance on traffic surfaces. Furthermore, polyurethanes have faster curing times, allowing for increased productivity and a more forgiving nature in the field which drives their acceptance in multiple building applications.

Polyurethane joint sealants come in both single component (moisture cure) and plural component (chemical cure) systems with different speeds of reactivity. Single component polyurethanes are moisture cured and offer longer working life, while plural component products have a standard-to-fast cure time, limiting the window of opportunity when installing. However, the faster cure time provides a faster finish, which limits defects due to rain or environmental contaminants such as leaves or insects. If necessary, it also allows for faster cutting or grinding in the case of concrete floor joints as specified in Divisions 03 or 32.

The solids content of polyurethane sealants is typically medium to high. High solids sealants have little to no solvent in their composition and were first introduced to comply with increasingly stringent VOC regulations. Due to this increased solids content and lack of solvent, these types of sealants needed to be formulated differently than those coatings with low solids. The removal of solvents, which are used to compensate for viscosity, flow and curing, require the low solvent sealants to have different characteristics and methods of handling.

In most cases, fillers, pigments and other modifiers such as flow and leveling agents, solvents and specialty additives may also be used to formulate a complete commercial joint sealant. Raw material suppliers have developed technology and methods for joint sealant formulators to employ to allow for user-friendly yet robust joint sealant systems.

QUIZ

1. True or False: Silicone joint sealants generally adhere well to both glass and ceramic surfaces.

2. True or False: Joint sealants and caulks are basically different words describing the same technology.

3. Which of the following is a characteristic of a high performance joint sealant?
   a. Fills a gap
   b. Prevents liquid from entering a joint
   c. Has adhesive and cohesive properties
   d. Can move with the substrate to keep the joint sealed
   e. All of the above

4. Which type of joint sealant can be formulated to both seal as well as protect concrete floor joint shoulders?
   a. Silicone
   b. Polyurethane
   c. Polyurea
   d. Both B and C

5. Which type of joint sealant provides a unique combination of flexibility, weatherability, as well as chemical and abrasion resistance?
   a. Acrylic
   b. Polyurethane
   c. Silicone

6. True or False: Polyurethane joint sealants only come in single component (moisture cure) systems.

7. Which high performance joint sealant discussed has a very fast cure time as an attribute?
   a. Polyurea
   b. Silicone
   c. Polyurethane

8. The solids content of polyurethane joint sealants is typically _____ .
   a. Medium to high
   b. Low to medium

9. High performance joint sealants can be specified in which of the following divisions?
   a. Division 03
   b. Division 04
   c. Division 07
   d. Division 08
   e. Division 32
   f. All of the above

10. True or False: In Division 07 9200, joint sealants are specified depending on the type of joint and application.

This article continues on http://go.hw.net/AR092017-2. Go online to read the rest of the article and complete the corresponding quiz for credit.

SPONSOR INFORMATION

MULTIFAMILY, MID-RISE BUILDINGS USING WOOD CONSTRUCTION

A COST-EFFECTIVE AND SUSTAINABLE CHOICE FOR ACHIEVING HIGH-PERFORMANCE GOALS

Presented by: reTHINK WOOD®

WREN
Location: Los Angeles, CA
Architect: Togawa Smith Martin

The $144 million WREN multifamily project in L.A.'s fast-rising South Park district helped to rewrite a neighborhood's narrative through thoughtful innovation, commercial discipline, and the magic of a remarkably nimble building material … wood. The glittering pair of seven-story buildings transform the skyline along Pico Boulevard through a series of innovations, including the city's first Type III double-podium design. The challenge for wood framed buildings in high seismic zones is how to provide large glass areas and still provide sufficient shear walls. To achieve this, the team worked with the structural engineer to determine the minimal length of shear wall required at each floor. Any area not required for shear wall was used for windows. The structural characteristics of wood were blended to create an aesthetically pleasing open grid on the exterior of the building. Photo: Kevin Korczyk / Jeremy Samuelson

LEARNING OBJECTIVES

Upon completion of this course the student will be able to:

1. Identify the sustainability and economic benefits of using wood construction for mid-rise multifamily or mixed use buildings
2. Summarize building code requirements and provisions for mid-rise multifamily wood-frame structures
3. Discuss wood framing solutions that address issues such as shrinkage, fire protection, and seismic requirements while minimizing the carbon footprint of the building
4. Explore innovations in wood framing design techniques and wood product technologies that enhance energy efficiency

CONTINUING EDUCATION

AIA CREDIT: 1 LU/HSW
GBCI CREDIT: 1 CE HOUR
AIA COURSE NUMBER: AR092017-3
GBCI COURSE NUMBER: 920013097

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/AR092017-3 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

Multifamily housing has been, and continues to be, a very active part of design and construction activity across the United States. In many settings, that involves multi-story buildings containing apartments, condominiums or co-op units designed to meet the needs of a broad community or specific lifestyle. It can also include other particular residential uses such as dormitories, convents, long term stay hotels and motels, or vacation timeshare properties. In all of these cases, one of the most fundamental decisions facing a design team is what structural materials to construct the building out of. Steel, concrete, and masonry typically come to mind, but in recent years wood construction of various types has become quite popular and preferred. While commonly thought of for single family residential construction, the cost-effective, code-compliant, and sustainable attributes of wood construction carry over to mid-rise multifamily projects too. In this article we will look at some of the reasons for the rising popularity of wood in multifamily buildings, review code compliance and fire safety technical considerations, and discuss techniques for successful wood building designs. In addition we'll address two trends that are expanding the opportunities for wood use in multifamily, multi-story design.

WHY WOOD?

Developers and design professionals have recognized wood construction as a way to effectively achieve higher density housing at a lower cost, all while reducing the carbon footprint of their projects. Here are few experiences of architects who have completed some successful multifamily projects using wood construction.

Cost Savings

Among their benefits, wood buildings typically offer faster construction and reduced project first costs. For example, after completing the first phase of a developer-funded five-story student housing project using steel construction, OKW Architects in Chicago switched to wood. "The 12-gauge steel panels used in the first phase were expensive, very

CASE STUDY: MULTIFAMILY DEVELOPMENT HOME RUN

2016 Wood Design Award Winner: Brooklyn Riverside, Jacksonville, Florida. Architect: Dwell Design Studio. Photo: Pollack Shores, Matrix Residential

Project: The Brooklyn Riverside

Location: Jacksonville, FL

Architect: Dwell Design Studio

Award category: Regional Excellence

Completed in 2015 for a construction cost of $24 million, The Brooklyn Riverside consists of seven Type VA multi-residential buildings, with a total of 310 units and 77 private tuck-under garages. Density was an important design objective, and the use of automated sprinklers as well as significant open frontage and parking allowed the design team to add another level and thus increase the number of units. The project also includes a 2,200-sf clubroom, leasing office, fitness center, gaming center, pool, and amenity deck, which features a covered bar and lounge. Given the project location, moisture management was a key design consideration. Among the team's strategies, wood structural sheathing panel was used as an exterior applied air barrier, breezeway entries and garage slabs are dropped 6" from adjacent finished floors and slope toward the exterior, and perimeter isolation strips are used within each unit, between the gypcrete, wall finish, and baseplate.

Source: American Wood Council

Residential

Permanent stay multiple-family facilities (R-2) and Transient (R-1)

(i.e., apartments, convents, dormitories, fraternities and sororities for R-2; hotels and motels for R-1)

NFPA 13 Sprinklers

100% Open Perimeter

	Type IIIA	Type IIIB	Type VA	Type VB
Maximum stories	5	5	4	3
Maximum building height (ft)	85	75	70	60
Total building area (at maximum permitted stories) (ft^2)	270,000	180,000	135,000	78,750
Total building area (ft^2), single-story building	114,000	76,000	57,000	33,250
Total building area (ft^2), two-story building	180,000	120,000	90,000	52,500

IBC maximum allowable heights and areas for residential wood construction

heavy and difficult to install; and welding and screwing the shear strap bracing was very time consuming," says project architect Eileen Schoeb. "Using wood was far more economical for the second phase."

Similarly, for the three-building, five-story Berkshire Terminus (formerly Crescent Terminus) development in Atlanta's upscale Buckhead district, wood framing helped to achieve overall budget goals. Architect Erik Brock of Lord Aeck Sargent noted, "From a design standpoint, we were able to use wood to introduce a fresh, contemporary aesthetic to a mid-rise multi-level development. By saving on the framing and speed of construction, Crescent Communities was able to deliver a higher-quality finished product for their tenants by putting more into the amenity package, landscaping, finishes and overall character of the residential units." Note that Crescent Communities was the developer, hence the original building name Crescent Terminus, but the property was subsequently bought by an affiliate of Boston-based Berkshire Group, and the name was changed to Berkshire Terminus.

Code Compliant, Marketable Structures

Many design professionals who are familiar with wood construction for two- to four-story residential structures are not aware that the International Building Code (IBC) allows five stories of wood-frame construction in many residential building occupancies and six stories for business occupancies. Five-story wood buildings are increasingly common, but some designers used to other materials still aren't aware that the International Building Code (IBC) allows five stories of wood-frame construction for most occupancies—including multi-family, military, senior, student and affordable housing—and six for business. "Wood buildings are quality buildings, and they're safe buildings," said Lisa Podesto, PE, Senior Technical Director with WoodWorks-Wood Products Council. "Building codes are meant to be material neutral, which means that a midrise wood-frame building is required to meet all of the same safety and performance requirements as a similar building made from any other material. Once building owners and designers have that awareness, one of the most compelling reasons to use wood is cost. Wood buildings tend to offer a high percentage of rentable square footage at a relatively low cost—which helps developers maximize the value of their projects. Wood's aesthetic, versatility and sustainability also make it the most desirable choice for many design teams."

When asked how building with wood fits into Crescent Communities' mission of quality, Jared Ford, Senior Vice President cites design flexibility. "With concrete, you can't easily design to have the building pop in and out to create the architectural reveals the way you can with a wood-frame building. We can do a lot more design-wise with wood that we couldn't do with other products. So both our design goals and our commitment to the environment provided the motivation for Crescent Terminus to be a wood-frame building."

Sustainability

Wood construction offers advantages for project teams seeking green building certification or simply to reduce the environmental impact of their buildings. Wood grows naturally and is renewable, and life cycle assessment studies consistently show that wood offers environmental advantages in terms of embodied energy, air pollution, water pollution, and other impact indicators.[1]

CASE STUDY: LUXURY AND PERFORMANCE

Berkshire Terminus, Atlanta, Georgia. Architect: Lord Aeck
Photo: Richard Lubrant

Project: Berkshire Terminus

Location: Atlanta, Georgia

Architect: Lord Aeck Sargent

Year of completion: 2014

Surrounded by high-rises, Berkshire Terminus consists of three luxury apartment buildings, each with three levels of parking topped with five stories of wood-frame construction.

"This land was at a cost basis that is among the highest in our portfolio," says Jared Ford, Senior Vice President for Crescent Communities. "It's prime real estate, but that's where the market is. We're either building or hunting in 13 of the top 20 metropolitan markets, and we're almost entirely focused on wood-frame multi-family apartments."

As with any complex project, there were a number of design challenges. For example, to maintain the integrity of the fire rating of the exterior bearing walls, the team used top-chord bearing trusses for the floor framing. To minimize shrinkage, techniques included using engineered wood for the plates and blocking in the first two floors, and larger sealant joints around windows and doors to allow movement. The team also designed stairs with double stud walls to provide a 2-hour fire separation, specified concrete block construction at the elevator shaft, and used a wood-frame wall to separate the elevator shaft from the rest of the construction.

From a carbon footprint perspective, wood continues to store carbon absorbed during the tree's growing cycle, keeping it out of the atmosphere for the lifetime of the building—or longer if the wood is reclaimed at the end of the building's service life and reused or manufactured into other products. The manufacturing of wood products also results in less greenhouse gas emissions than other materials.[2] For example, the Berkshire Terminus development in Atlanta includes three buildings, each with five stories of wood- frame construction over a concrete podium. Using the online Wood Carbon Calculator for Buildings[3], the project has been shown to store and avoid the equivalent to 13,523 metric tons of CO2. The U.S. Environmental Protection Agency's Greenhouse Gas Equivalencies Calculator identified that this equates to emissions from 2,583 cars in a year.

In terms of long term durability and life cycle, a survey of 227 buildings demolished in Minneapolis/St. Paul found that buildings are often torn down within 50 years. This was true regardless of construction materials, and was instead more commonly due to the changing building needs and increasing land values as opposed to material performance issues.[4] Overall, wood buildings in the study had the longest life spans, showing that wood structural systems are fully capable of meeting a building's longevity expectations. In addition, when the embodied energy in demolished buildings is considered along with the implications of material disposal it is clear that longer lasting buildings are more sustainable. Further, the fact that wood can be reused at the end of its service life in a building, either through renovation or deconstruction and reuse (with minimal additional processing) is a significant advantage.

THE BUILDING CODE AND WOOD CONSTRUCTION

As with any type of construction, mastering the technical details of wood-frame construction is critical to creating cost-effective buildings that are durable, safe, and code compliant. Building codes require all building systems to perform to the same level of safety, regardless of material used, and wood-frame structures can be designed to meet or exceed standards for (among other things) fire protection, seismic performance, and resistance to high winds. The International Building Code (IBC) is the predominant model building code in the United States, having been adopted by most jurisdictions with or without amendments. It is reviewed and/or amended over a three year cycle with the 2015 edition being the latest version and the one that will be referenced throughout this article. (Note that for specific projects in specific locations, other versions may be in effect such as the 2012 edition.) Some specific, relevant items are addressed as follows.

Construction Types

Chapter 6 of the IBC categorizes buildings into five distinct types of construction. Each building type is further subdivided into A and B sub-types with A indicating higher fire resistance ratings than B.

- Construction Types I and II are generally limited to non-combustible materials such as concrete and steel for structural and some non-structural items. Wood is an allowable material in nonbearing walls and partitions that do not require a fire rating.
- Type III is defined as noncombustible exterior walls and interior walls of any material allowed by code. Fire-retardant-treated wood framing is allowed per the provisions of the code for exterior wall assemblies of a 2-hour rating or less.
- Type IV is also known as Heavy Timber (HT) and also requires noncombustible exterior walls. Interior building elements are defined as made from solid or laminated wood without concealed spaces. The IBC elaborates on different types of solid and laminated wood products and requirements for each. This construction type has received a lot of attention lately due to its growing use in multi-story buildings of all types, including multifamily.
- Type V allows structural elements, exterior walls, and interior walls to be constructed of any material allowed by code including common wood framing systems.

Tim Smith, AIA, is a founding principal of Togawa Smith Martin, Inc. in Los Angeles, and a pioneer of five-story wood framing in California. He has looked carefully at the appropriate use of each of these five construction types and notes that, "From a cost perspective it makes no sense to use Type I for five stories. Type I is more realistic for taller buildings. Type III using wood construction helps fill the gap between low-rise and taller buildings."

Permissible Increases in Area and Height

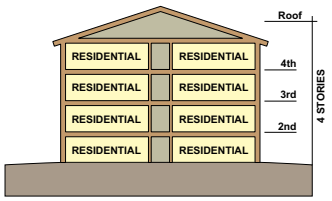
Chapter 5 of the IBC addresses "General Building Heights and Areas." There are several considerations here:

- **Allowable heights** are determined based on occupancy classification and construction type as shown in Table 504.3. Multifamily buildings (R Occupancy) with no sprinklers and built with Type III, IV or V construction are allowed to be between 40 and 65 feet tall depending on Type and subtype (A or B). However, virtually all new R Occupancy multifamily buildings must now have fire sprinklers under Chapter 9 of the code. Therefore, new multifamily

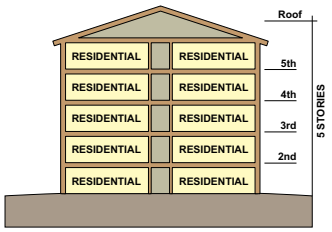
buildings with sprinklers can be up to 60 feet tall if a sprinkler system in accordance with NFPA Standard 13R is installed. If a sprinkler system is installed per the broader

Permissible increases in height and area under the 2015 IBC

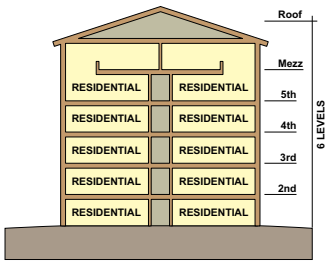
IBC Table 503: Base Height



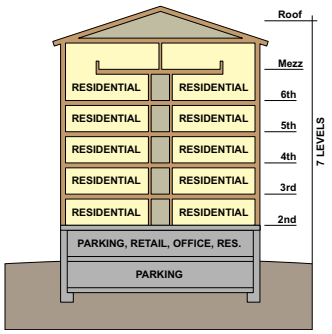
IBC Section 504: NFPA 13-Compliant Sprinkler System



IBC Section 505: Mezzanine



IBC Section 510.2: Podium



Source: Togawa Smith Martin

This article continues on http://go.hw.net/AR092017-3. Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. Compared to other materials, installation time for wood construction is typically:
   a. greater. b. slightly more.
   c. equal. d. less.

2. From a carbon footprint perspective, wood:
   a. stores carbon for the lifetime of the building or longer if the wood is reclaimed and reused or manufactured into other products. b. loses an average of 4,000 metric tons of CO_2 per five-story building.
   c. stores carbon until it is cut into lumber. d. loses carbon into the atmosphere once the building is enclosed.

3. Multi-story light frame wood construction generally falls under:
   a. Type I and Type III construction. b. Type IV and Type V construction.
   c. Type III and Type V construction. d. Type II and Type III construction.

4. IBC allows increases in building height and area for wood construction:
   a. only if a sprinkler system is installed. b. if there is a parking area but no yard in front of the building.
   c. when a mezzanine half the size of the floor below is added. d. if fire walls are installed.

5. The design of the joints between building envelope components, such as windows and doors, must allow for:
   a. moisture retention. b. differential shrinkage.
   c. continuous load paths. d. airflow.

6. When a multi-story wood-frame structure is built over a concrete podium, the building is treated by code as separate and distinct buildings:
   a. for purposes of height, area and continuity of fire walls. b. only if there are fire-resistant wall assemblies in the wood structure.
   c. if the concrete podium has two levels of parking beneath it. d. only if the wood structure has four stories.

7. Fire-retardant-treated (FRT) wood is an acceptable substitute for a non-combustible material for a:
   a. Type IIIA exterior two-hour rated bearing wall. b. Type VB exterior one-hour rated bearing wall.
   c. Type VA exterior one-hour rated bearing wall. d. None of the above

8. True or False: Shrinkage effects need not be considered for horizontal framing members in the wall and floor design.

9. During an earthquake wood frame structures offer a high strength-to-weight ratio, which results in:
   a. low inertia force compared with concrete or steel. b. higher inertia force compared with concrete or steel.
   c. containment of transfer loads induced by seismic activity. d. fewer redundant load paths.

10. Panelized systems:
    a. are manufactured on site. b. offer better quality wall construction.
    c. optimize stud design. d. both b. and c.

SPONSOR INFORMATION

reTHINK WOOD®

reThink Wood represents North America's softwood lumber industry. We share a passion for wood and the forests it comes from. Our goal is to generate awareness and understanding of wood's advantages in the built environment. Join the reThink Wood community to make a difference for the future. Be part of the conversation to "rethink" wood use, address misperceptions and enhance awareness of wood's benefits and choices. Learn more at www.rethinkwood.com.

VARIABLE REFRIGERANT FLOW

A VERSATILE HVAC SOLUTION FOR K-12 EDUCATIONAL FACILITIES

Presented by:

MITSUBISHI ELECTRIC
COOLING & HEATING

LEARNING OBJECTIVES

At the end of this course you should be able to:

1. Explain how VRF provides K-12 educational facility occupants with a high level of control over their personal comfort while reducing energy usage and utility costs.
2. Understand how VRF addresses strict indoor air quality (IAQ) requirements.
3. Identify how quiet operation and the ability to handle varying loads makes VRF an ideal solution for educational environments.
4. Describe how VRF systems require minimal maintenance and no specialized training to operate and maintain.

CONTINUING EDUCATION

AIA CREDIT: 1 HSW/LU
AIA COURSE NUMBER: AR092017-4

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://www.go.hw.net/AR092017-4 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

VRF—THE SMART SOLUTION FOR K-12 FACILITIES

Architects who are primarily responsible for designing K-12 educational buildings have likely heard of Variable Refrigerant Flow (VRF) HVAC systems. However, it is unlikely that many have experience designing with VRF systems or a comprehensive understanding of VRF systems and their benefits.

K-12 educational facilities face a long list of HVAC challenges, including occupant comfort and the need for a high level of control. Other specific challenges to K-12 educational facilities include: stringent indoor air quality requirements (especially pertaining to ventilation), the need for low noise levels, a range of comfort demands across a variety of spaces and occupants, and a preference for simple maintenance. A school's challenges also change depending on its location in the country; for example, a school in Florida will likely have humidity concerns while a school in Vermont will often face cold-climate heating challenges.

Variable Refrigerant Flow (VRF), an HVAC technology, is a great solution for almost any K-12 educational facility. It responds to each of this application's specific challenges, offering industry-leading efficiencies, integration with ventilation systems, advanced indoor air filtration, whisper-quiet operation, zoning capabilities and more. VRF is also a smart choice for any location in the country, including the coldest climates.

While VRF is regarded as a cutting-edge technology, it has a long, proven history in K-12 applications—both for new construction and retrofits. Many building professionals are now looking to VRF as the K-12 world changes. For example, regions that previously did not require cooling systems, such as the Northeast, are now requesting cooling due to an extended or shifted school year and hotter outdoor temperatures. As VRF manufacturers continue to innovate and improve, the technology evolves from being a good solution for K-12 educational facilities to the optimal solution.

VRF responds to the specific challenges of K-12 educational facilities, offering industry-leading efficiencies, integration with ventilation systems, advanced indoor air filtration, whisper-quiet operation and zoning capabilities.

VRF—A BRIEF OVERVIEW

The U.S. Energy Information Administration states that as much as 40 percent of a building's operating costs are tied to HVAC and other mechanical systems. Therefore, it's important to minimize operating costs while achieving other goals such as reliable performance, personalized comfort and a modern aesthetic. VRF makes the most of budget and space while offering energy-efficient technology that leads to superior occupant comfort.

VRF achieves such success by dividing a building's interior into zones, each of which can be operated separately. This is possible because of the outdoor units' inverter-driven compressor which varies its motor rotation speed, allowing it to precisely meet each zone's conditioning requirements while reducing overall power consumption. For VRF with heat recovery, some spaces can even be cooled while others are simultaneously heated. This is achieved by redistributing the rejected heat from areas being cooled to areas that require heating.

The system's capacity is distributed among the indoor units via a branch circuit controller, which takes the refrigerant that comes from the outdoor unit and distributes it appropriately among a network of indoor units, allowing a user to connect multiple indoor units to one outdoor unit. VRF technology moves refrigerant directly to the area that needs to be conditioned, which is more efficient than moving conditioned air or water throughout a building, and allows for better control within zones. The result is personal comfort control for occupants.

This isn't a new technology. VRF has been used throughout the world since the 1980s and in many countries is the most-used HVAC technology. For example, in Japan VRF represents approximately 90 percent of installed systems within commercial buildings, Europe approximately 81 percent and China approximately 86 percent. VRF for commercial applications was introduced to the U.S. market in 2003. Since then, there have been major improvements in the performance of the inverter-driven compressor, including improved energy efficiencies and reduced operational noise. There have also been major improvements in heating capabilities, including the ability to provide 100% heating capacity while outdoor temperatures are below zero.

Over the years, buildings using VRF have also discovered the benefits of its reduced and simple maintenance requirements. If you've heard that VRF requires a lot of maintenance, and that this maintenance requires advanced training, you've heard wrong. While VRF manufacturers do offer training programs for system designers and installers, the system is ultimately simple to operate and maintain. As a state-of-the-art system, it also offers powerful self-diagnostics that aid in troubleshooting.

Additional end-user benefits include:

- Reduced utility bills
- Personalized comfort control
- Whisper-quiet operation
- High Indoor Air Quality (IAQ)

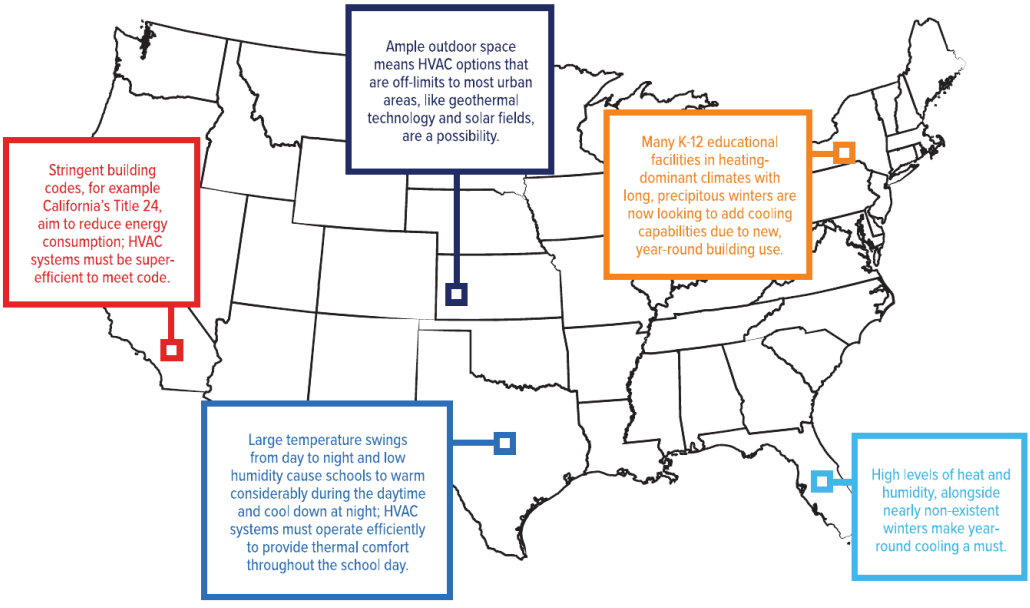
With so much to offer, it's no surprise that much of the world has taken to VRF, including many K-12 educational facilities across the country. Now let's explore the challenges specific to these facilities, and see how VRF responds to each.

THE UNIQUE CHALLENGES OF K-12 EDUCATIONAL FACILITIES

Schools' HVAC requirements range greatly depending on factors like their size or age groups served. Perhaps the most significant factor determining a school's HVAC needs is location. Different regions have different climates, population dynamics (how dense the area is, and if its population is increasing, stagnant or decreasing), level of interest in sustainability and building or energy codes. The graphic below demonstrates the challenges in different regions of the country. Despite these differences, VRF acts as a unifying technology, offering schools in every region a smart solution to their biggest HVAC challenges. The next section addresses those challenges, and how VRF responds to them.

CHALLENGE: TIGHT BUDGETS

Anyone involved with operating a school knows that energy management is an ongoing challenge. At the heart of that challenge are two opposing forces pulling at facility managers: keeping costs down and keeping occupants comfortable. Energy costs throughout the country vary, but even when they're relatively cheap, energy costs are still a huge consideration for schools that must keep hundreds of occupants comfortable throughout the day. At the same time, the cost of energy



HVAC challenges in different regions of the United States.

is going to continue to increase. Teachers and students aren't focused on this fact, however. They just want to be comfortable in their spaces, and they'll do what they have to do to achieve that comfort—adjust thermostats in their classroom, open or close windows and open or close doors.

VRF offers a solution to this ever-present challenge by providing superior lifecycle costs. The first cost savings are seen in ease of design and installation, as there is little to no ductwork and VRF enables an owner to reclaim usable square footage such as in spaces that otherwise would go to mechanical rooms. This can also take the form of minimized roof penetrations, where two small refrigerant pipes connect the outdoor unit(s) to the indoor units, reducing installation costs and impact. VRF's smaller footprint translates to a lighter weight which ultimately lowers construction costs by requiring less structural support and reducing the amount of materials and labor required.

While VRF's initial equipment cost can be higher than that of some traditional HVAC systems, VRF's installation and operational costs are often lower. For example, compared to integrating a controls systems into a building management system, VRF saves money during installation with its standard controls system. Further cost efficiency can be achieved by selecting an advanced controls system provided by the VRF manufacturer, as this eliminates the need for multiple controls integrators. Installation costs can also be reduced because VRF offers a simpler installation than conventional HVAC systems, saving on materials and labor.

When it comes to saving money during operation, VRF offers industry-leading efficiencies. As efficiencies increase, operational costs decrease. Thanks to VRF's inverter-driven compressor, users can expect to see a savings of up to 25 percent on utility bills. In addition, the ability to turn off zones when not in use, such as over the summer or longer holidays, contributes to further savings. For example, the maintenance staff could choose to run the HVAC in offices, but not the gym, cafeteria or classrooms.

Over a product's lifetime these benefits add up, ultimately making the case that VRF is a superior financial choice compared to other HVAC options. Some manufacturers have even developed tools that quantitatively demonstrate the advantages of VRF, simulating the life cycle cost and other calculations for old and new buildings.

Below you'll see sample, simplified outputs from two actual simulations. The first compares the life cycle cost of VRF to water source heat pump (WSHP) and variable air volume (VAV) systems. The second compares the Energy Use Intensity of VRF to WSHP, VAV and the ASHRAE baseline (PTAC-DX/gas). In an actual simulation, both outputs would quantify the figures only visually displayed here—for example estimating the Lifetime Equipment cost of VRF, WSHP and VAV to the nearest dollar. These quantified estimates are based on specific input criteria such as location, square footage and whether a building is being renovated or newly constructed.

CHALLENGE: STRICT INDOOR AIR QUALITY REQUIREMENTS

In K-12 educational facilities, indoor air quality is vitally important, as healthier kids have better attendance and performance. Viruses, bacteria, allergens, dust, gases and other contaminants circulate inside, creating breathing hazards and foul odors. Illness spreads quickly as kids touch surfaces. As a result, schools face a host of codes relating to indoor air quality (IAQ). VRF addresses this challenge in four ways:

Offering Advanced Filtration

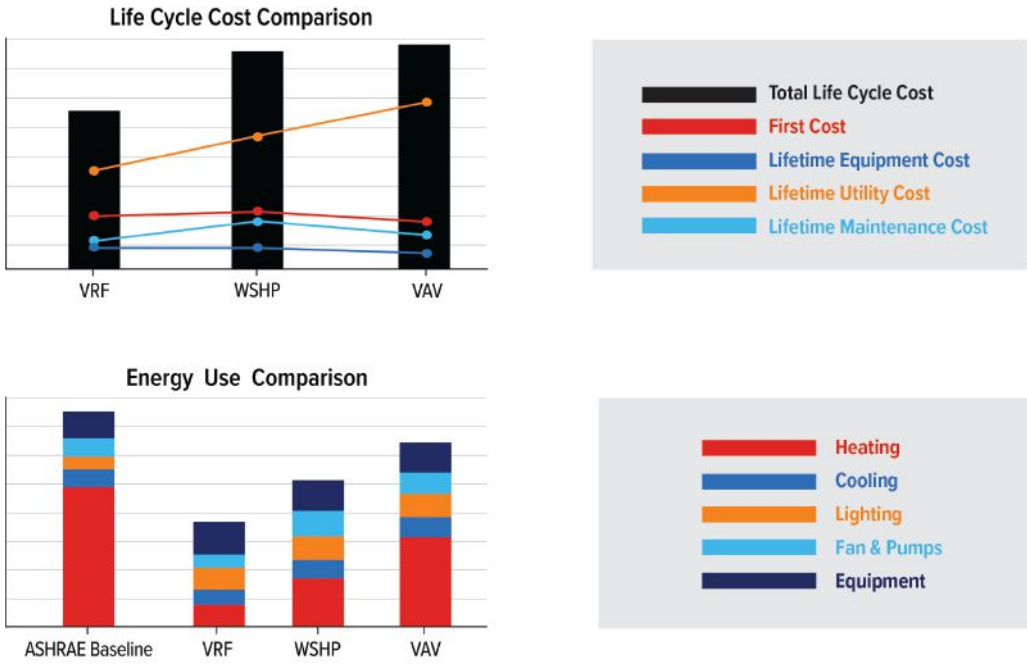
VRF's indoor units have filters that capture and remove contaminants that can trigger allergy and asthma symptoms, spread illness and impact air quality. Some manufacturers offer platinum deodorizing filters, which use nanotechnology to absorb odors to neutralize the worst smells. VRF's filters are easily accessible and washable, and last up to 10 years, simplifying and improving the effectiveness of routine maintenance.

Continuously Providing Comfortable Temperatures

With traditional, non-inverter compressor technology, the outdoor units tend to cycle throughout the day, turning on and off repeatedly. The frequent cycling causes major temperature swings and potential health issues. VRF meets the load requirements of a space and maintains the desired (or set point) conditions.

Providing Zoning Capabilities

Isolating an indoor air handler within a classroom helps contain a sick student's germs within that zone, a boon to IAQ. Otherwise one child's sneeze can get passed along to many people as air is shared among different zones within a conventional HVAC system.



Select VRF manufacturers have developed energy modeling tools to simulate the lifecycle performance of VRF systems versus other HVAC technologies. The simulations provide quantified estimates to help the user make a more informed application decision.

In K-12 educational facilities, indoor air quality is vitally important, as healthier kids have better attendance and performance. VRF addresses this challenge by offering advanced filtration and zoning capabilities, continuously providing comfortable temperatures and integrating with ventilation systems.

Integrating with Ventilation Systems

Ventilation air is often viewed as a challenge in applying VRF in school applications because of the high outside air requirement typically found in this application. However, there are numerous ways to address this challenge while still maintaining, and even adding to, the energy efficiency of a VRF system. The approach considered will vary based on the project's climate, but there are a few common ways to address this issue.

In warm and dry climates, outside air can often be brought into the VRF systems via inline fans, with little to no preconditioning of the outside air. The VRF indoor unit will mix this air with the return air from the space, fully condition it, and introduce it back into the space being served. This method is best suited for climates where the design outdoor temperatures and humidity levels, as well as the required amount of outside air, do not result in mixed air temperatures to the coil exceeding manufacturer-recommended limits. If this isn't the case, further conditioning of the outside air is required.

In some regions of the country, excluding those with high relative humidity and depending on the amount of outside air required, this conditioning can be achieved with an Energy Recovery Ventilator (ERV). Often, ERVs can be used with an unbalanced airflow (to allow positive or negative pressure in the space), and will allow for energy recovery to/from the exhaust air stream prior to discharging. It should be noted that ERVs, often used as preconditioning devices, do not typically fully condition the supply air to room-neutral conditions, so further conditioning is highly recommended before introducing the air into the space being served.

QUIZ

1. Which of the following is a challenge faced by K-12 educational facilities?
   a. Occupant comfort
   b. Need for high level of control
   c. Stringent air quality requirements
   d. Need for low noise levels
   e. All of the above

2. True or False: For VRF with heat recovery, some spaces can be cooled while others are simultaneously heated.

3. In which region of the United States are many K-12 facilities looking to add cooling capabilities due to new, year-round building use?
   a. West coast
   b. Southwest
   c. Midwest
   d. Southeast
   e. Northeast

4. True or False: While VRF's initial equipment cost can be lower than that of some traditional systems, VRF's installation and operational costs are often higher.

5. Thanks to VRF's inverter-driven compressor and other efficient features, users can expect to see a savings of up to _____ percent on utility bills.
   a. 5
   b. 15
   c. 25
   d. 55

6. Which challenge is met by offering both advanced air filters and zoning capabilities?
   a. Strict indoor air quality requirements
   b. Minimal operational noise levels
   c. Varying loads and comfort needs
   d. Controlling multiple spaces

7. True or False: VRF indoor units have a lower decibel rating than a whisper.

8. True or False: A school with several campuses spread across a county could use VRF's advanced controls to manage every building on every campus.

9. Which school discussed in this article is the largest Living Building Challenge Certified School in the country?
   a. Hollis Montessori
   b. Willow School

10. Which school discussed in this article is the country's first certified Passive Independent School?
    a. Hollis Montessori
    b. Willow School

For those instances where a relatively large amount of outdoor air is required, a Dedicated Outside Air System (DOAS) is recommended. DOAS units are typically designed to fully condition outside air to room-neutral conditions, allowing it to be introduced directly into the space, independent of the VRF system. This is known as a decoupled system, and provides the additional benefit of allowing the two systems to operate completely independently if desired. In some climates, the DOAS system may alternatively be used to temper the air, delivering it to the VRF indoor units for final conditioning. However, it must be noted that the resultant entering air conditions to the VRF indoor unit must be examined to ensure that those conditions are within manufacturer-recommended limits.

This article continues on http://www.go.hw.net/AR092017-4. Go online to read the rest of the article and complete the corresponding quiz for credit.

SPONSOR INFORMATION

MITSUBISHI ELECTRIC
COOLING & HEATING

Mitsubishi Electric Cooling & Heating is an industry-leading manufacturer of innovative Zoned Comfort Solutions™ and Variable Refrigerant Flow (VRF) air-conditioning and heating technology that delivers comfort and efficiency to buildings of all shapes, sizes and applications.

COMPLETE WALL SYSTEMS

MAINTAINING CONTINUOUS INSULATION AND WRBS AT TRANSITIONS

Presented by:

LEARNING OBJECTIVES

Upon completion of this course the student will be able to:

1. Understand the performance of the wall components: air layer, water layer and insulation.
2. Examine the different types of details: penetrations, terminations and transitions.
3. Identify common installation and detail problems that occur on the jobsite.
4. Describe the assignment of contractor responsibility for installation sequencing of the various layers.

CONTINUING EDUCATION

AIA CREDIT: 1 LU/HSW
AIA COURSE NUMBER: AR092017-1

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/AR092017-1 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

INTRODUCTION

For centuries, buildings were considered and designed simply as shelter to protect from the elements. Today that purpose holds, but the technology, design practices and materials that go into high-performing building enclosures have evolved to do much more to protect the building as a whole, as well as occupants. Assembly components such as continuous insulation (CI) and air/water resistive barriers (WRB)—once seen as overly conservative practices—are now required across the country.

Challenges associated with continuous insulation and water resistive barriers primarily concern maintaining continuity. Architects and building professionals can anticipate and address these challenges when they design details. This practice requires constant application of building science fundamentals and an in-depth understanding of a wall system's materials, layers and performance. The junctures, or transitions, in building detail design arguably matter most. Improper design of these transition details can lead to some of the most common, detrimental and expensive issues in wall assemblies, namely leaks and thermal bridges.

In this article, we will review building science fundamentals in terms of complete wall systems with continuous insulation and air and water barriers. We will also look at aspects that need to be considered when designing transitions and penetrations, and examine common issues that arise from errors in sequencing, material compatibility and design verification.

BUILDING SCIENCE FUNDAMENTALS

When discussing complete wall system design and detailing, it's important to review fundamental building science concepts regarding how wall assembly components function at each layer within a wall—and how they are tested for performance. These concepts aid in understanding the physical behavior of a building as a system, and how that affects key performance issues such as energy efficiency, durability, indoor air quality and occupant comfort.

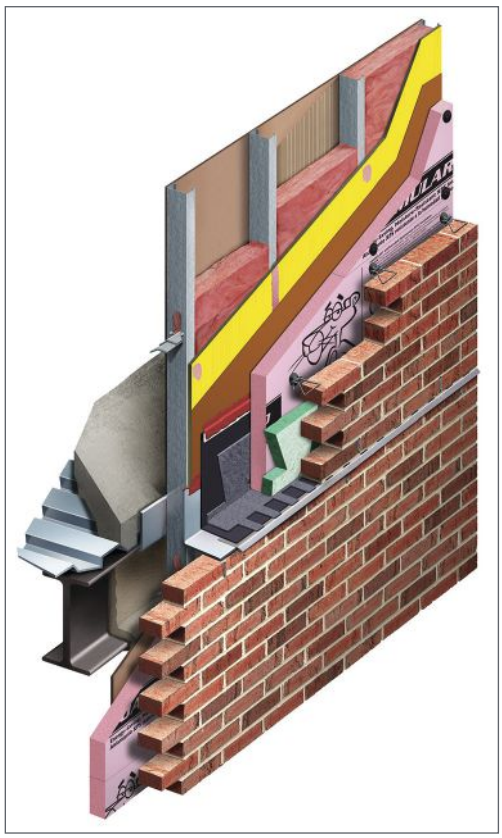
Wall System Components

A wall system contains multiple layers of components to create a cavity wall. A good way to think about a wall system is as a "ham sandwich" with the letters HAMM representing heat, air and moisture both in liquid and vapor forms (thus the double "m"). These layers are critical to wall performance, and they are bolstered with new codes and higher standards that factor in fire performance and acoustic properties.

Wall system layers include:

1. A structural system, which serves as the base of the wall. Possible construction types for the structural system may be steel stud with gypsum sheathing, wood stud with wood sheathing or concrete masonry unit (CMU);
2. A cavity, which contains multiple products; and
3. Cladding, which can be brick, CMU, stone, metal, aluminum composite or any number of new sustainable materials.

The wall cavity is critical, because it is where the most important aspects of building science and performance are addressed. Everything occurs in this space including air and water management, thermal comfort, vapor control, fire resistance, acoustic isolation and structural considerations such as how insulation and cladding are attached to the wall.



Typical wall system layers for steel stud/gypsum sheathing construction with masonry cladding. Components in the air cavity layer can include barriers, flashings, sealing washers, drainage preservation, insulation, anchors and fasteners. Image courtesy of Owens Corning. The color PINK is a registered trademark of Owens Corning.

Moisture as a Liquid

Moisture can exist in three states, either solid (ice), liquid or vapor. Liquid and vapor are the most common forms that cause the most problems in wall systems. We'll discuss liquid first, because it is the most obvious and easiest to see. Precipitation such as rain hits the outside of a building and follows the path of least resistance. A good way to think about this is to consider the path of a raindrop from the time it hits the rooftop until the time it gets to the ground. If the building is constructed well, the moisture will not rest on seams or find a way into the building. If it does find its way inside, problems can be endless. The first step to controlling moisture penetration is to test the structure's performance.

ASTM International has made specification and installation to resist moisture infiltration very easy with ASTM E2112, a standard specification for installing windows in a manner that prevents liquid water from penetrating the wall; note the raindrop illustration below.

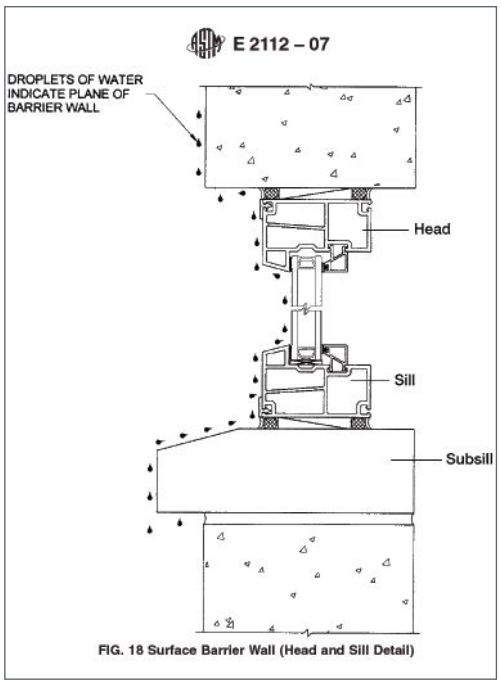


FIG. 18 Surface Barrier Wall (Head and Sill Detail)

ASTM E2112. Image courtesy of ASTM.

For drawings and specifications, architects typically specify assembly testing in accordance with ASTM E331. This test is referenced in the International Code Council (ICC) AC38, also known as the *Acceptance Criteria for Water Resistive Barriers*. ASTM E331 applies a water resistive barrier to an assembly, and then a wall of water is sprayed directly at the surface for 15 minutes. A standard "pass" is accomplished by having no moisture penetration occur after 15 minutes. Most manufacturers, however, test to failure to see how much longer than 15 minutes their wall can resist water infiltration.

In short, the goal—and fundamental principle—of water management is to shed water by layering materials in such a way that water is directed down and out. Given how critical water management is, it should be no surprise that it is a top priority with building design. To reiterate: the first rule of waterproofing is to weather-lap installations so that the water has a clear pathway from the top of the building all the way to the ground, and then away from the building. Water should never have a place to stop or pool on a building, where it then might enter the structure. This is a relatively basic and somewhat obvious concept, but it is something that is often overlooked in architectural drawings or in-field repairs and should be kept in mind when analyzing the specific details of a design.

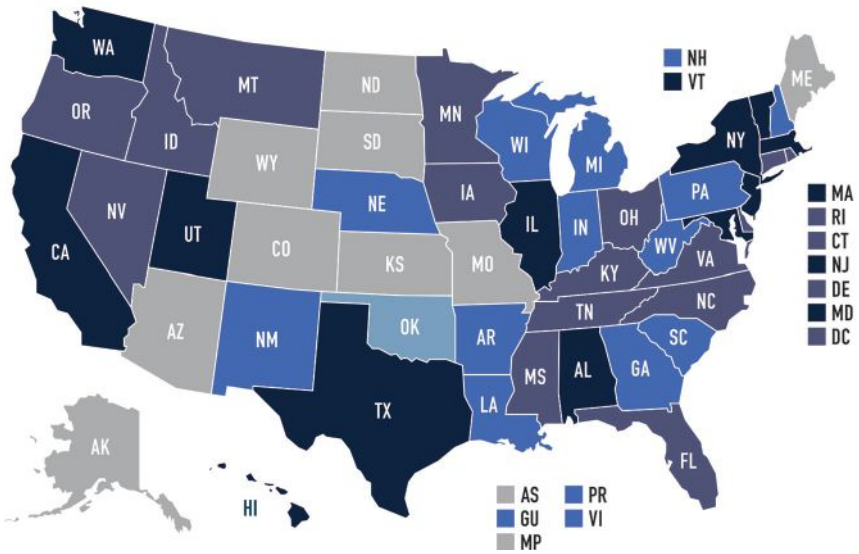
Heat

Thermal comfort—the task of keeping heat either in or out of a building—mainly deals with the transfer of heat. In the U.S., this involves what are known as U-factors, k-factors and R-values.

- "U-factor" describes the actual quantity of thermal energy conducted through an assembly. Lower U-factors represent greater resistance to heat flow, and therefore better overall insulating properties for an assembly.
- "k-factor" describes the actual quantity of thermal energy conducted through a material. Lower k-factors represent greater resistance to heat flow, and therefore better overall insulating properties for a material.
- "R-value" commonly is used to define thermal resistance for insulation either as an individual material. R for individual materials can also be totaled to determine total assembly R in the context of the building envelope, such as the walls, floors, and roofs.

U, k and R are related in that they are reciprocals of each other. "U" is the reciprocal of "total R" for an assembly. "k" is the reciprocal of "R" for an individual material. For example, a 0.25 k-factor equals an R-value of 1/0.25 = 4. A U-factor of 0.05 equals a total R-value of 20.

In some instances individual material R-values are referenced when evaluating system



Zone	ASHRAE 90.1-1999*		ASHRAE 90.1-2004		ASHRAE 90.1 2007 & 2010		ASHRAE 90.1 2013 & 2016		IECC 2012 & 2015	
	Non-R	R	Non-R	R	Non-R	R	Non-R	R	Non-R	R
1	13	13	13	13	13	13	13	13	13 +5.0	13 + 5.0
2	13	13	13	13	13	13 + 7.5	13 + 3.8	13 + 7.5	13 + 5.0	13 + 7.5
3	13	13 + 3.8	13	13 + 3.8	13 + 3.8	13 + 7.5	13 + 5.0	13 + 7.5	13 + 7.5	13 + 7.5
4	13	13 + 3.8	13	13 + 7.5	13 + 7.5	13 + 7.5	13 + 7.5	13 + 7.5	13 + 7.5	13 + 7.5
5	13 + 3.8	13 + 7.5	13 + 3.8	13 + 7.5	13 + 7.5	13 + 7.5	13 + 10.0	13 + 10.0	13 + 7.5	13 + 7.5
6	13 + 3.8	13 + 7.5	13 + 3.8	13 + 7.5	13 + 7.5	13 + 7.5	13 + 12.5	13 + 12.5	13 + 7.5	13 + 7.5
7	13 + 7.5	13 + 7.5	13 + 7.5	13 + 7.5	13 + 7.5	13 + 15.6	13 + 12.5	13 + 15.6	13 + 7.5	13 + 15.6
8	13 + 7.5	13 + 18	13 + 7.5	13 + 10	13 + 7.5	13 + 18.8	13 + 18.8	13 + 18.8	13 + 7.5	13 + 17.5

Building Codes Assistance Project Code Status Maps, Commercial Code Status and Corresponding List of Required R-Values for Steel Framed Walls. Map courtesy of Building Codes Assistance Project.

performance against energy code requirements. R-value requirements for steel framed walls, wood framed walls and mass walls vary across the country depending on local energy codes, editions and climatic zones. Local codes are based on both the International Building Code (IBC) and International Energy Conservation Code (IECC), and may be based on an ASHRAE 90.1 standard or something mandating even higher performance such as ASHRAE 189.1, depending on the building type and location.

The map and corresponding chart above show current energy code requirements by state or territory and a list of standard R-value requirements as they have applied to the past few energy code cycles and varying climate zones. The first number listed is the R-Value prescribed for stud cavity insulation. The second number is the additional CI, or continuous insulation prescription. The energy code is rapidly causing most commercial buildings to use continuous insulation throughout the country, even in places such as the southern tip of Florida, where insulation was previously not a priority because of the temperate climate.

Continuous insulation is important because it affects thermal bridging, or areas where energy used to heat and cool is lost, and where the threat of condensation is the greatest. A building may have a high level of insulation, but it may lose energy because of too many thermal bridges by careless detailing and design. Later, we will look at specific ways to maintain continuity of insulation through the transitions and penetrations of the wall.

Air

Air leakage greatly impacts building energy efficiency and indoor air quality. Past building practices tolerated—even accepted and expected—air leakage to some extent, so that the building could "breathe." Modern practices, however, recognize that the idea of having a building "need to breathe," meaning random versus designed ventilation, is misguided, and instead encourage a sealed building envelope combined with fresh air provided through carefully controlled HVAC systems and other controlled ventilation such as operable windows. HVAC systems control the amount of air that enters and leaves the building, and conditions and filters that air based on the energy efficiency and indoor air quality needs of the building and occupants. Random air leakage is uncontrolled, unconditioned and potentially will contribute to the accumulation of condensation moisture in assemblies leading to eventual mold growth and system decay.

There are several ASTM standards that define air barriers. ASTM E283 was one of the first to demonstrate an air barrier, testing the rate of air leakage across the specimen through exterior windows, curtain walls and doors. As an early test, it was limited in that it only tested a small specimen at a limited pressure, and only looked at a single product.

The standard ASTM E2357 tests larger specimens (assemblies) at multiple pressures. This test involves an opaque wall and penetrated wall assembly, both of which are tested for air leakage, conditioned at varying pressures over different test times, and then retested for air leakage before comparing the tightness of the opaque specimen versus the penetrated specimen. For example, the conditioning starts with long, low pressures and ends with short, strong gusts, all intended to fatigue the test specimen. To simulate positive and negative pressures the pressure is applied to both sides of the specimens. After the conditioning, both walls are tested again for air leakage, and then compared. A difference of greater than 10% leakage between the solid and opaque walls is considered failing.

ASTM E2357 tests the performance of a limited system, and identifies how well materials stick together and adhere to their substrates. ASTM E2357 is becoming the predominant test to demonstrate air barrier systems on the market today.

When an air barrier is not present in a wall assembly, the HVAC system is compromised and works inefficiently to maintain thermal comfort and humidity levels within a building. Installing an air barrier as tested per ASTM E283, E2178 (both individual material tests), or most commonly as an entire assembly per ASTM E2357, helps create a wall assembly that allows the HVAC system to do its job.

Moisture as a Vapor

While exterior liquid moisture is easy to see as it runs along the outside of a building, vapor

moisture is a bit trickier to identify and deal with because you can't see it and it happens within the wall itself. A good way to think about the concept of moisture as vapor is to consider how a cold glass "sweats" in a hot, humid climate, leaving a pool of water on the table. A phase change happens when the high water vapor content in the air comes into contact with the cold temperature of the glass, resulting in water vapor gas condensing into a liquid. The same thing can happen within a wall structure, especially where one surface is warm and another cool or cold.

Wall structures should be designed to prevent condensation moisture. This sounds quite obvious, but it is not always easy to achieve. Some key strategies are:

- Maintain temperatures in the assembly that prevent moisture from condensing, or,
- Prevent vapor from reaching a cold surface where it could condense, and
- Enable drying out of any areas where condensation may occur. If a wall does get wet, every attempt should be made to dry it as much as possible, and to quickly address the problem.

According to the IBC, vapor permeable materials and vapor retarders are measured and classified with ASTM E96 method A. That standard should be specified during design.

One question that must be addressed in designing to manage moisture vapor is, shall materials and assemblies be permeable or impermeable? While older buildings were inevitably permeable because of the available materials and components and air leakage, newer buildings can be designed to be either permeable or impermeable, and thus address very specific moisture concerns. For example, an art museum in Miami, a high exterior vapor pressure environment, would require a building design with highly controlled interior humidity levels, so a vapor-permeable air barrier system that would allow exterior moisture vapor to migrate inward would be counter-productive. In this case, an impermeable wall assembly, that limits inward moisture vapor migration, will allow the HVAC system to function more efficiently. The bottom line is that building designers need to consult with the HVAC designer to discuss the needs of each individual project and further analysis may be provided through consultants and manufacturer resources.

QUIZ

1. What are the 3 wall system components?
   a. Structural, Cavity, Cladding
   b. Foundation, Structural, Cladding
   c. Foundation, Framing, Roof

2. What important function occurs in the wall cavity?
   a. Air and water management
   b. Thermal comfort
   c. Vapor control
   d. Fire resistance
   e. Acoustic isolation
   f. All of the above

3. True or False: The first rule of waterproofing is to weather-lap installations so that the water has a clear pathway from the top of the building all the way to the ground, and then away from the building.

4. Which ASTM standard tests larger assemblies at multiple pressures?
   a. ASTM E283 tests which of the following?
   b. ASTM E2357
   c. ASTM E2178
   d. ASTM E96

5. True or False: Modern fire rating requirements state that both the components of an assembly and the system as a whole must be tested for compliance in order to be considered safe.

6. _____ occur between a change in plane, or change in material, and _____ are actual openings to the outside or inside of a wall, such as a window or door.
   a. Transitions, penetrations
   b. Penetrations, transitions

7. True or False: It is not necessary for the roof membrane to be continuous and tied in with the continuous air barrier on the wall.

8. True or False: In the floor line transition detail discussed, the insulations act as a fire barrier between floors.

9. _____ insulation, which is used in the foundation-to-wall transition example, is one of the few insulation types that is water resistant (and retains its R-value in the presence of water) and able to perform in the harsh below-grade conditions.
   a. EPS
   b. Mineral wool
   c. XPS
   d. Fiberglass batt

10. Which of the following is necessary in quality control and assurance?
    a. Sequencing
    b. Adhesion and compatibility
    c. Verification
    d. Mock-ups
    e. Testing
    f. All of the above

This article continues on http://go.hw.net/AR092017-1. Go online to read the rest of the article and complete the corresponding quiz for credit.

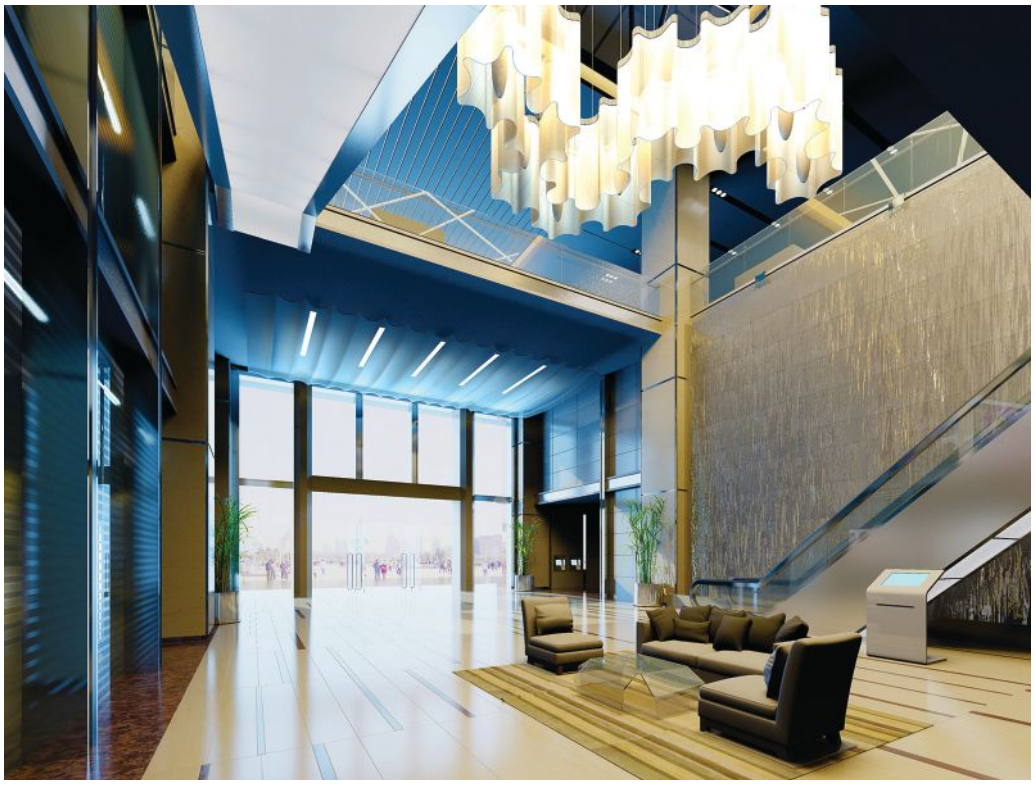
SPONSOR INFORMATION

Owens Corning develops, manufactures and markets insulation, roofing and fiberglass composites. Global in scope and human in scale, the company's market-leading businesses use their deep expertise in materials, manufacturing and building science to develop products and systems that save energy and improve comfort in commercial and residential buildings.

EXTRUDED ALUMINUM TRIM

INNOVATIVE SOLUTIONS FOR INTERIOR APPLICATIONS

Presented by:



LEARNING OBJECTIVES

Upon completion of this course the student will be able to:

1. Explain how extruded aluminum trim products can be used to improve and enhance drywall surfaces.
2. Summarize the sustainable features and performance characteristics of aluminum.
3. Discuss the various profile and finish options that are available for aluminum interior trim products.
4. State the methods and considerations related to the installation of aluminum trim products for interior spaces.

CONTINUING EDUCATION

AIA CREDIT: 1 LU/HSW
AIA COURSE NUMBER: AR092017-5

Use the learning objectives above to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit http://go.hw.net/AR092017-5 and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

USING EXTRUDED ALUMINUM TRIM PRODUCTS FOR INTERIOR APPLICATIONS

The famous quote attributed to Mies van der Rohe, "God is in the details," continues to haunt architects because details are where architects can and do make a difference. With today's focus on green materials, detailing needs to meet an architectural design aesthetic, as well as durability and sustainability requirements, creating challenges for architects. Luckily, this is one instance where knowledge of detailing can contribute to all of these prerequisites because specifying extruded aluminum interior trim products can fulfill aesthetic, durability and sustainability requirements.

A unique and diverse new line of extruded aluminum trims was designed to enhance all practical aspects of drywall construction and transform it into a design medium that can make it the feature, the focus and the most impactful element of a well-designed space. Extruded aluminum trims can be used to create the appearance of fine metal craft that is integrated with drywall and panelized surfaces at a fraction of the cost of having custom metalwork designed, detailed and fabricated for a project.

Working with a strong collaboration between architects and experienced design professionals, an extensive line of interior aluminum extrusions was produced that creates a variety of visual statements from minimalist shadow lines to bold 2-piece design features. The growing and evolving collection includes simple reveals, corner and base transitions that help to create clean lines, shadow lines and reveals that make a space stand out.

This collaboration recognized and addressed the struggle to complete projects with a completely modern look without the expense of custom metalwork. Utilizing interior aluminum extrusions provides the ability to create minimalistic shadow lines in any environment or make beautiful feature walls using only trims and drywall. Previously these could only be achieved with costly metal craftsmen or in-field solutions using multiple configurations of other building materials.

Since the interior of a building has many intersecting materials, there are numerous details to consider in the design process.

Using aluminum extrusions, it is now possible to create simple reveals and transitions to improve and enhance drywall surfaces. Well beyond that, aluminum extrusions offer new shapes and forms. For example, manufacturers have introduced the appearance of fine metal craft integrated with drywall and panelized surfaces. These are done at a much lower cost than having custom metalwork for a given project.

Why Use Extruded Aluminum Trim for Interiors?

While extruded aluminum trim has been an option for exterior trim for some time, a new line of extruded aluminum trims designed specifically for interior use is on the market, extending the possibilities for use in interior detail work. When building professionals talk about details, they are referring to the way the parts and pieces of an interior space come together: how they're joined and how they intersect.

Since the interior of a building has many intersecting materials, there are numerous details to consider in the design process. Ideally, they all support a single design language—an aesthetic. In contemporary architecture, these details can range from the sublimely simple to the ornate, with equally wide-ranging costs. Trim, specifically, is used for a variety of reasons to finish the interior look of a given space to:

- Sculpt interior walls
- Separate wall materials
- Provide architectural detail
- Create horizontal/vertical lines
- Contribute to a modern aesthetic
- Provide clean intersections of drywall
- Supply protection and a finished edge for vertical drywall or panel corners

Aluminum billets are pressed through a die to create extruded aluminum shapes or profiles. Following the extrusion process, a variety of options are available to modify the color, texture and brightness of the aluminum's finish.

MANUFACTURING OF EXTRUDED ALUMINUM

Aluminum, the most abundant mineral in the earth's crust, is derived from bauxite deposits mined from the earth. Aluminum extrusion is a highly versatile metal-forming process that has a wide array of desirable physical characteristics. For example, aluminum is easily machined due to its malleability, yet it is one-third the density and stiffness of steel.

After initial processing, a form called alumina undergoes smelting and alloying, producing solid billets of cast metal. These aluminum billets are pressed through a die to create extruded aluminum shapes or profiles. Following the extrusion process, a variety of options (e.g., anodizing and painting) are available to modify the color, texture and brightness of the aluminum's finish. Quality aluminum trim products are precisely manufactured under extreme tolerances to produce highly refined results without the need for master craft skilled labor.

Most extruded shapes for architectural use are fabricated from 6063, an aluminum alloy with magnesium and silicon as the alloying elements. Known as Type 6063-T5 aluminum, commonly referred to as the architectural alloy, it has a very smooth surface and is the best alloy suited for anodizing applications. The T5 designation indicates it has been artificially aged and moderately heat-treated.

CHARACTERISTICS OF EXTRUDED ALUMINUM

Aluminum is a durable and highly recyclable material that has become a vital element in today's world, providing products that offer strength and stability in a wide variety of applications. Aluminum extrusion is used for a wide range of purposes, ranging from common items like foil, zippers, smart phones and building materials, to wiring the nation's power grid and housing the International Space Station. Since its development, aluminum extrusion has become a viable and adaptable solution for a growing number of manufacturing needs.

Extruded aluminum has a long list of qualities that make it a durable and economical choice as a building material. It is fire resistant and non-combustible. Even at extremely high temperatures, it does not produce toxic fumes. Aluminum does not rust because it is protected by its own naturally-occurring oxide film. It is this resilience that allows it to spring back from the shock of impact depending on the temper applied.

Additionally, aluminum poses no health risks or physical hazards. Aluminum trim products are defined as "articles" by the Occupational Safety and Health Administration (OSHA) and are therefore exempt from the requirement of publishing material safety data sheets.

Aluminum is relatively inexpensive and may not require long lead times, depending upon required paint or base finish type. Even short-run prototypes often can be produced at moderate cost. Aluminum trims can add a design aesthetic to a wide range of interior applications. Finally, it can be easily manufactured to accepted standard dimensional tolerances.

Aluminum is Sustainable and Recyclable

Aluminum is considered the sustainable material of choice in many markets because of its significant environmental and economic benefits. As a whole, aluminum is constructed from 75 percent to 100 percent post-industrial and post-consumer scrap, making it an excellent sustainable choice.

Aluminum trims can add design aesthetic to a wide range of interior applications.

In addition, aluminum is a strong, highly durable material that offers a long service life. Aluminum is lightweight, weighing about one-third of most other metals, which makes it easier to handle and less expensive to transport. Due to its strength, aluminum prevents swelling and buckling.

For those organizations looking to build a space that is resource efficient, aluminum can help earn LEED® v4 certification as it adheres to the following criteria:

- Energy and Atmosphere Credit: Optimize Energy
- Materials and Resources Credit: Building Product Disclosure and Optimization - Environmental Product Declaration (EPD)
- Indoor Environmental Quality Credit: Low-Emitting Materials

Aluminum is the only material in the consumer disposal stream that more than pays for the cost of its own collection. Aluminum produced in North America is more sustainable today than ever before due to technological advances and voluntary environmental efforts. Since 1995, the amount of energy required to make new aluminum is down more than a quarter and the industry's carbon footprint has been reduced nearly 40 percent.

Aluminum is 100 percent recyclable, making the metal one of the most recyclable of all materials. In fact, the impact of aluminum recycling on the environment has been profound. The production of recycled aluminum saves more than 90 percent of the energy costs associated with primary production. When compared with primary production, recycled aluminum production uses only 8 percent of the energy while generating only 8 percent of the emissions. Additionally, aluminum can be recycled indefinitely without losing any of its superior characteristics. An interesting fact: approximately 75 percent of all aluminum ever produced is still in use today.

What Products are Available?

Current product offerings on the market include simple reveals and transitions that enrich the aesthetics of drywall surfaces. Manufacturers have created shapes and forms that introduce the appearance of fine metal craft integrated with drywall and panelized surfaces at a fraction of the cost of having custom metalwork designed, detailed and fabricated for a project.

While most products are meant to be used with 5/8" drywall or in some cases panels, custom designs can be manufactured to accommodate a wide variety of other materials such as glass, tile, panels, etc., in other thicknesses.

Depending on the application, trim products may be made of a variety of materials including aluminum, polyvinyl chloride (PVC), wood (baseboards) and rubber (corner guards).

Aluminum trim profiles contribute to a modern aesthetic, provide clean intersections of drywall, sculpt interior walls, create horizontal/vertical lines, separate wall materials and supply a finished edge for vertical drywall or panel corners.

Advantages of Extruded Aluminum Trim

Aluminum trims are an excellent choice for interior trim because they can withstand greater daily abuse than most materials as they are stronger, maintain their shape better, and are less vulnerable to damage than non-metal alternatives. Using aluminum as an option adds durability and longevity to construction, whereas PVC deteriorates over time, a trait that other trim materials simply cannot achieve at the same level of detail and design.

Aluminum trims, when anodized or with a polished finish, are more aesthetically pleasing than other materials and provide the designer with a greater ability to match a finish with doors, windows, frames and other design elements. Additionally, extruded aluminum trims install straight and true. Since aluminum trim products were designed specifically to enhance drywall construction, while taking into account the typical design and construction of commercial interiors, they provide more solutions to design aesthetics.

For example, in the design and construction of commercial interiors, 5/8-inch-thick drywall on metal studs is still the high-value, low-cost workhorse for defining the perimeter of spaces, creating separation, and working as a very flexible substrate for limitless embellishments. However, it doesn't get much credit for this because it is seen as so simple, so common and so disposable. With the cost of construction continuously rising, schedules shrinking and field skill sets diminishing, designers and architects are constantly looking for ways to create unique spaces that leverage budgets, schedules and craftsmanship availability. In short, to build spaces that produce the most "bang for the buck."

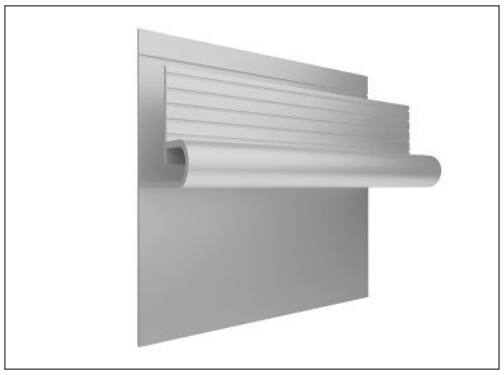
To address the issue, extruded aluminum trim products were designed and manufactured to enhance the practical aspects of drywall construction and transform it into a design medium that can make it the feature, the focus and the most impactful element of a well-designed space. Quality aluminum trim products are precisely manufactured under extreme tolerances to produce highly refined results without master craft skilled labor.

Meeting all the demands of modern construction, aluminum interior trim products are sustainable, durable, lightweight and easy to use. Aluminum trim's durability, sustainability and long life is also easy to work with, and cost-effective, while enhancing drywall construction. These features allow for building spaces with clean lines and innovative designs. Aluminum trims can be the feature, the focus and the most impactful element of a well-designed space.

ALUMINUM INTERIOR TRIM PROFILE AND FINISH OPTIONS

Extruded aluminum trims are manufactured in profiles 0.050 in thickness, which is thin enough to be bent at a slight curve (when applying to studs during installation), yet thick enough that it cannot be bent with ease. Profiles can be made stronger and thicker, as needed for most applications. Additionally, complex shapes can be realized in one-piece extruded aluminum sections without having to employ mechanical joining methods. The

resultant profile is typically stronger than a comparable assemblage and less likely to loosen over time.



The baseboard detail is one of the more prominent details to consider in interior design as it serves to cover the joint between the finished wall and floor. It also protects a highly trafficked area of an interior space from wear and tear.

Baseboard Detail Options

The baseboard detail is one of the more prominent details to consider in interior design as it serves to cover the joint between the finished wall and floor. It also protects a highly trafficked area of an interior space from wear and tear. There are several options to consider for base details and each has its place in every designer's toolbox.

Extruded aluminum bases are typically installed horizontally and are available in a range of styles to satisfy a variety of design requirements. A standard base detail is typically a 3 1/2-inch profile installed on top of the drywall. In some applications, a quarter round is used as a flooring joint between the flooring itself and the baseboard for aesthetic appeal. Some modernists have questioned the utility of the traditional baseboard; consequently, a number of contemporary options have evolved that provide the design community with more options.

No Baseboard Detail Options

One option is to eliminate the baseboard completely which creates a simple, minimalistic aesthetic. A baseless option reduces the material, installation, and finishing costs of a conventional baseboard. However, the downside is that the wall base is more susceptible to damage from foot traffic and equipment; therefore, it is generally used in industrial or commercial applications where there is minimal foot traffic and less risk of damage. Additionally, eliminating the baseboard requires taping of the lower edge of the drywall and there is less tolerance for error in the drywall finishing process. The joint between the wall and floor should be kept open with a 3/4-inch reveal (shadow line) to allow the surfaces to move independently. This is accomplished by separating the drywall from the floor with a piece of Z-metal.

QUIZ

1. What percentage of aluminum is recyclable?
   a. 75%
   b. 90%
   c. 100%

2. Extruded aluminum bases are typically installed _____.
   a. vertically
   b. diagonally
   c. horizontally

3. True or False: Square reveals are used to provide a structural function.

4. The production of recycled aluminum saves _____ of the energy costs associated with primary production.
   a. > 90%
   b. 80-85%
   c. < 85%

5. True or False: Powder coating is a dry finishing process that is extremely popular, representing at least 15% of the total industrial finishing market.

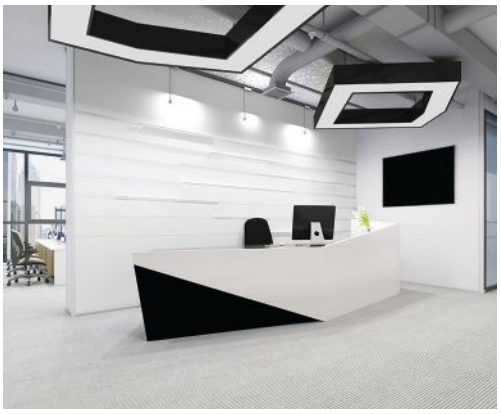
6. True or False: When cutting aluminum trim, you should start at an outside corner.

7. True or False: Extruded aluminum trims are manufactured in profiles of 0.010" in thickness.

8. When installing aluminum trims, drywall tape should:
   a. not be used
   b. overlap the edge of the reveal
   c. not overlap the edge of the reveal

9. Since 1995, energy required to make new aluminum is down more than a quarter and the industry's carbon footprint has been reduced by_____.
   a. 30%
   b. 40%
   c. 50%

10. True or False: As a whole, aluminum is constructed from 75% to 100% post-industrial and post-consumer scrap.



Some modernists have questioned the utility of the traditional baseboard; consequently, a number of contemporary options have evolved that provide the design community with more options.

This article continues on http://go.hw.net/AR092017-5. Go online to read the rest of the article and complete the corresponding quiz for credit.

SPONSOR INFORMATION

XTREMEINTERIOR

ARCHITECTURAL SOLUTIONS

SMALL DETAILS. BIG IMPACT.

The possibilities are endless when you design with our extruded aluminum trim profiles.
Contact an XtremeInterior representative for more infomation at 844.365.9462 or visit our website at www.xtremeias.com

TO FORMAWALL® INSULATED METAL PANELS.

The latest evolution of Formawall insulated metal panels enables you to push the envelope further and create a more sustainable building environment.

See the next chapter in sustainable innovation at ABX/Greenbuild 2017, booth 2277.

CENTRIAperformance.com/nextchapter

CENTRIA

REIMAGINE METAL

AIA Architect

AIAVoices

PHOTOGRAPHY: TODD WINTERS

The Architectural Imperative

Value is created, not assigned.

Peggy Deamer is a professor of architecture at Yale University, the principal of Brooklyn, N.Y.–based Peggy Deamer, Architect, and co-founder of the Architecture Lobby, a nonprofit dedicated to raising awareness of architects, their individual rights as workers, and their collective value to society. Her work—which draws on architecture critics Adrian Stokes and John Ruskin, psychoanalyst Melanie Klein, architect and writer Manfredo Tafuri, and sociologist Richard Sennett—centers on defining the architect's intellectual and creative ownership in a 21st-century cultural climate. "Change," says Deamer, "begins with a sense of agency."

As told to William Richards

For me, possessing information is the opposite of fetishizing an object. Architects have so much information—we're trained to think humanistically, to heed building codes, to investigate materials, to draw on psychology, and to solve organizational problems. But we suppress this information when we talk to clients or the media because we think that all they care about is the final product: the building itself.

Architects wrongly assume that their creative-design expertise will be recognized by the world, and that expertise alone will make those who are at the top stay at the top. On the other hand, architects rightly assume that their contribution to the public realm is a real one. We are doing much more than decoration or making beautiful environments. We offer benefits and opportunities to improve people's lives—and it's a good aspiration that most of us hold.

We have to start with John Ruskin, and his respect for the connection between the architect's design and the builder's efforts, which was about a holistic process that nurtured everyone. For him, that was the mark of a moral society. Generations later, Adrian Stokes understood this, and pointed to a psychological imperative: The design process should be judged both by the products we make as well as what those products offer the creator. How you look, how you carve, how you draw, how you talk—those psychological aspects are part of a bigger picture of cultural production. And the connection between what we do as architects and how we design is much closer than anyone is talking about in popular discourse.

In writing about Venetian buildings, Stokes looked for evidence that the carver or the designer struggled with the materials—shaping the stone itself, how the stone casts shadows, how the stone invites pigeons to roost. What he uncovered was not the architect's unbending will to shape forms—which is part of the popular myth of the lone genius. Instead, he uncovered evidence of the struggle between the maker and what's been made. And for me, the "maker" is a really important part of the architect's value. AIA

A vibrant community

AIA is a vibrant community of architecture and industry professionals that are transforming our profession. Members enjoy access to industry-best benefits, products and services that support practice and professional development.

Visit aia.org/join to learn more about how you can leverage all that we have to offer and become a member.

Join today and receive free registration to A'18, the AIA Conference on Architecture in New York City, June 21-23, 2018.*

AIA

*Visit aia.org/join for terms and conditions.

AIANow

By Steve Cimino
Art Direction by Jelena Schulz

We the Public

On Sept. 16, the second Chicago Architecture Biennial will open to entice the public at large to "Make New History" by considering projects that tie our shared built heritage to architectural production today. Considering that a lot of big decisions about zoning, civic projects, and public-private ventures are made in the name of the public interest, we asked five exhibitors to define what the "public" really means.

"The public is a group of people who gather around a set of common values. I think that, for architects, designing a built environment that supports the production of these shared values—which can be cultural, epistemic, or performative—is pursuing public interest." —**Michelle Chang, assistant professor, Rice School of Architecture**

"We think of the public as an active participant in design, but not in the usual 'design by committee' process. Instead, we approach buildings as part of a dialogue with the public that encourages people to construct narratives about place and culture through form and experience. The public animates a building both with moving bodies and with their imagination." —**Stewart Hicks, co-founder, Design With Company**

"I am interested in the idea of the civic, which is grounded in *civitas*, the laws that bound citizens together in ancient Rome, articulating their rights and responsibilities. These relations between the one and the many actually form the foundation for any possibility of the *res publica*. Therefore, I am interested in civic space as the physical reflection of collective relations, whether established by law, custom, or tradition." —**Marshall Brown, principal, Marshall Brown Projects**

"Like a practical joke, architecture is best when everyone is in on it." —**Carrie Norman, AIA, and Thomas Kelley, founders, Norman Kelley**

"How we behave towards buildings says more than words about our collective interest in them, and people behave differently towards monuments than they do towards any other public building type. Consider the fact that people are willing to put themselves in harm's way to protect monuments, as if such buildings were vitally essential to them. Monuments are a wellspring of lessons for architects who care for the public interest." —**Jorge Otero-Pailos, AIA, professor and director of historic preservation, Columbia University Graduate School of Architecture, Planning and Preservation**

ILLUSTRATION: LAUREN NASSEF

AIAFeature

A Tale of Two Cities

Seattle and Taipei, an ocean apart, both offer innovative solutions to geographical challenges.

By Kim O'Connell

PHOTOGRAPHY: GETTY IMAGES

AIA Seattle boasts 2,300 members and sells out nearly 80 programs, exhibits, and installations during its annual two-week-long design festival, held this month. Learn more at *aiaseattle.org*.

The Pacific Rim, made up of nearly 50 countries on four continents, boasts striking and often volatile physical landscapes. Coastal mountain ranges, jagged in profile and part of the volcanic Ring of Fire, are juxtaposed against coral atolls mere feet above sea level—all largely prone to earthquakes and tsunamis. Vibrant and economically important cities dot the Pacific Rim—the thrum of their central business districts and ports can be felt even while strolling through busy historic cores and dozens of UNESCO World Heritage Sites.

It is a dramatic cultural landscape, to be sure, but also an incredibly delicate set of ecosystems that are interdependent and ground zero for the impact of sea level rise. Despite this precarious situation (and, in fact, because of it) some Pacific Rim cities—such as Seattle and Taipei—have been ground zero for innovative design solutions.

Despite being an ocean apart, Taipei and Seattle have geographic similarities. They are both inland ports that are nonetheless deeply connected, culturally and practically, with the ocean. One of the jewels of America's Pacific Northwest, Seattle is situated on Puget Sound and boasts a population of about 700,000 (ballooning to 3.8 million when you include the surrounding metropolitan area). The capital of the mountainous island nation of Taiwan, Taipei is a city of 2.7 million that sits on the Tamsui River.

In addition to being oriented toward the water, Seattle and Taipei are both surrounded by mountains. Seattle is ringed by the Olympic Range and the Cascade Mountains, which include nearby protected areas such as the Mount Rainier and Olympic national parks. Taipei is just to the south of Yangmingshan National Park, famous for Qixing (Seven Star) Mountain, like Mount Rainier a dormant volcano.

Seattle's Best

With its mild northern climate and abundant natural beauty, Seattle has long attracted entrepreneurs and innovators, and is headquarters to such powerhouse companies as Boeing, Microsoft, Starbucks, Weyerhaeuser, and Amazon. Whether you are an expert barista or an aerospace engineer, it's an appealing place to live and work, as evidenced by the city's expanding population. (Seattle was the country's fastest-growing large city in 2016, according to the U.S. Census Bureau.) This level of engagement and activity seems to be mirrored by the architecture profession.

As one measure of architecture's prominence, AIA Seattle boasts 2,300 members and sells out nearly 80 programs, exhibits, and installations during its annual two-week design festival (held in September, this year's theme is "Power"), according to Lisa Richmond, the chapter's executive director. She says that more than ever before the chapter is advocating for sustainable innovation on a citywide scale.

Another unique project currently being discussed involves building a cap over Interstate 5, which cuts through the heart of the city, to create more downtown acreage. The new area could possibly make way for more affordable housing and parkland, and it may be more economically feasible for the city to "lid" the highway than to acquire an equivalent amount of land elsewhere.

AIA Seattle was involved in supporting dramatic changes to the central waterfront, which include a recent $400 million project to reconstruct the city's seawall that also proved to be innovative, Richmond says. Instead of an ordinary utilitarian concrete wall, the new seawall combines ecological design and public art. Among other elements, the seawall is designed to encourage the growth of microalgae that create habitat for the region's native salmon populations. As seas rise because of climate change, seawall construction will become more critical for coastal cities, and Seattle's ecologically minded approach could serve as a model.

"There seems to be a huge appetite for thinking about design and designing the future of our city," Richmond says. "I think a reason that people move here is the natural situation and the access to nature. There's been a long-standing respect for the environment, and that's reflected in a very forward-thinking commitment to high-performing buildings, density, mobility, and livability."

AIA Feature

CONTINUED

PHOTO: © LARA SWIMMER. COURTESY SUSAN JONES, ATELIERJONES LLC

The CLTHouse in Seattle, by atelierjones, is one of several projects featured in the National Building Museum's exhibition "Timber City," which ends its yearlong run this month.

This sentiment is echoed by Jim Cutler, FAIA, a principal of Cutler Anderson Architects, a firm based on Bainbridge Island across Puget Sound from downtown Seattle. "In Seattle, you have a pretty intact ecosystem on the perimeter, and consequently there is a combination of that powerful beauty, the national parks, and the city's surprisingly Scandinavian heritage, which has a deep appreciation for the built environment," Cutler says. "If there's an AIA Seattle event, you can get 1,000 to 1,200 people showing up for it. If you look at the number of architecture firms in the Seattle phone book, you'll find more than you have in the city of Philadelphia, which is five times the size."

This cultural respect for efficient design and the land has resulted in some groundbreaking design initiatives and projects. Take timber: The logging and timber industry has long fueled the economy of the Pacific Northwest, but this industry has been criticized for its environmental impacts. Now Seattle design firms are promoting the use of cross-laminated timber (CLT), an engineered wood product that can replace steel and be used in high-rise buildings, yet still has a smaller carbon footprint than steel or concrete. What's particularly beneficial is that even so-called "junk trees"—the kind that usually aren't worth much in traditional timber markets—can be harvested and used in CLT, reducing the fuel load in a forest while helping to create a sustainable building material.

The Seattle architectural firm atelierjones is one leader in promoting research and testing of CLT applications. Its design for a CLT house was recently on display at the National Building Museum in Washington, D.C., as part of its "Timber City" exhibition, and principal Susan Jones, FAIA, is the AIA National representative to the International Code Council's Committee on Tall Wood Buildings. "We all recognize here that the natural environment is limited and finite and majestic and needs to be protected," Jones says. "We've been trying to do that work with cross-laminated timber, to make sure our forests are sustainable and well-managed, and also provide for vibrant, innovative, and low-carbon buildings in urban environments."

Jones says that Seattle architects have also been forward-thinking about prefabricated

PHOTO: © LARA SWIMMER. COURTESY SUSAN JONES, ATELIERJONES LLC

Atelierjones' research led them to develop CLTHouse's NOVATOP, a panelized building system that can be reproduced utilizing cross-laminated timber.

In Seattle, you have a pretty intact ecosystem on the perimeter, and consequently there is a combination of that powerful beauty, the national parks, and the city's surprisingly Scandinavian heritage.
—Jim Cutler, FAIA

PHOTO: GETTY IMAGES (RIGHT). COURTESY B+P ARCHITECTS (BELOW)

Taipei's skyline might be dominated by Taipei 101, designed by C.Y. Lee & Partners (completed in 2004), but the experience of living and working in the Taiwanese capital is about discovering innovative solutions to density.

modular construction, something directly inspired by the city's shipping industry, which moves containers in and out of the port constantly. She points to a forthcoming 56-unit prefabricated modular multifamily building called Inhabit Burwell that atelierjones is designing for the OneBuild company in the Seattle suburb of Bremerton, Wash., which could be revolutionary for affordable and efficient workforce housing. "You can live there in a smallish unit, and then walk five minutes and take a fast ferry across the sound to downtown, then go to work at your office or your Starbucks café," she says. "Our firm is experimenting with different models of living and working and innovating in construction."

Type A Taipei

Similar innovation is happening in Taipei. In 2016, the Taiwanese capital was named the World Design Capital (WDC), a designation conferred on a city every two years since 2008 by the World Design Organization (formerly the International Council of Societies of Industrial Design) to "showcase effective design-led revitalization strategies and projects that other cities can benefit from."

This is a high honor for a city whose mid-20th-century architecture is called "shabby," "unattractive," and "slapdash" in *The Rough Guide to Taiwan,* the result of a building boom in the mid-20th century when the city took in nearly a million Chinese people from the mainland. The same travel guide acknowledges, however, that "Taipei's newest buildings are smart, stylish, and built to last." In applying for the recognition, city officials vowed that they would use the opportunity to incorporate more design-oriented thinking into city-government activities and to better celebrate Taiwan's particular culture through design.

For Jim Cutler, who has worked around the world, the traditional building culture in Taipei is one in which landscape constraints are something to be overcome versus revealed through architecture. "In Seattle, physical circumstances are seen as opportunities; but in Taipei—from what I saw—they seemed to be more challenges versus opportunities," he says. Cutler describes visiting one project on a steep hillside on which the builders had created terraces with retaining walls as high as 40 feet, with style taking supremacy over sustainability.

This ethic seems to be changing, however. Taipei's signature landmark is the 1,666-foot Taipei 101 building, which was completed in 2004 and was briefly the tallest building in the world. Despite quickly losing that distinction to Dubai's Burj Khalifa, the bamboo-shaped tower designed by C. Y. Lee & Partners is still recognized as one of the world's tallest green buildings, having earned LEED Platinum status. In its bid to win the WDC designation,

Taipei-based B+P Architects' recent design for a shipping-container art annex in New Taipei City is a nod to the city's multiphase port expansion that began in 1993.

AIA Feature

CONTINUED

PHOTOGRAPHY: COURTESY B+P ARCHITECTS (THIS PAGE)

Taipei-based B+P Architects' recent design for a shipping container art annex in New Taipei City is a nod to the city's multiphase port expansion that began in 1993.

Taipei officials touted a series of other recent sustainable projects, such as the green-roofed Beitou Library, the first building to earn diamond status under Taipei's EEWH (ecology, energy saving, waste reduction, health) green-building certification system. EEWH was only the second third-party certification system in the world after LEED.

For a region prone to earthquakes and tsunamis, Taipei has also been forward-thinking in its plans for protection against seismic forces. As recently as February, a magnitude 5.6 earthquake shook the city and other parts of Taiwan but caused no casualties, whereas a 1999 island-wide, magnitude 7.6 earthquake left 2,415 people dead. Taipei 101 is built to be flexible enough to withstand some movement in an earthquake or high winds; in fact, it contains a 728-ton pendulum within its structure—a dangling yellow globe called a "tuned mass damper"—that acts as a counterbalance if the building sways too far in any one direction. (Visitors can see the damper up close for a fee and an elevator ride to the 88th floor.)

Another more recent project is Taipei-based Kris Yao|Artech's design for the 50-story, 700-foot-tall Far Eastern Group's Mega Tower in New Taipei City (part of the capital's large metro area). This building optimizes seismic performance through a tube-in-tube structure, with bracings attached to the inner tube system to help absorb lateral loads—a clear recognition of Taiwan's unique geography and vulnerabilities.

Perhaps there is a metaphor to be found in Taipei-based B+P Architects' recent design for a shipping container art annex in New Taipei City that is covered in mirrors. The project, according to a description from the architects, allows the building to become a "delicate reflection of its surrounding environment (or perhaps you can also say this is a form of extension) and enables this artificial construction to escape from the fate resulting in vicious fighting for space against its environment." While the fate of this conurbation is unclear, Taipei's growth (matched only by Hong Kong and Shanghai) shows no signs of abating.

The repurposed shipping containers also provide a respite from the humid, subtropical climate of Taipei.

Plans are now in the works for a massive, multiyear, multibillion-dollar infrastructure improvement project in Taiwan that would focus on green energy, urban-rural projects, and sustainable transportation systems. AIA Seattle's Richmond is interested in watching how Taipei develops for two primary reasons. For one, the chapter is considering applying to become a World Design Capital. Richmond adds that Taiwan's ingrained bicycle culture is also of interest to Seattleites, as the city continues to build up its bike infrastructure through things like new bike lanes and to promote low-emission transit options in an increasingly congested city.

Going forward, cities like Seattle and Taipei could be widely influential in terms of how they handle geographic constraints, increasing populations, and the impacts of climate change. "In Seattle, with companies like Boeing and Amazon and Microsoft, we have world leaders that are changing the way we fly, shop, and do business," Susan Jones says. "So we realize it's within our realm to also change the way we build buildings." AIA

The leadership event of the year is coming to a venue near you!

AIA Leadership Institute 2017

Detroit, MI | Bentonville, AR | New Orleans, LA | Pasadena, CA | Washington, DC

November 16

Register today at aialeadershipinstitute.com

The American Institute of Architects

AIAPerspective

PHOTOGRAPHY: CARL BOWER

World Company Inc.

The "One Belt, One Road" initiative takes the lead in global infrastructure.

While our national government retreats from international trade and climate accords, all in the name of putting "America First," a main global rival is using a giant infrastructure and building program to forge ahead.

Invoking its rich history along the Silk Road, China is now funding and building 21st-century roads, rail lines, ports, airports, factories, power plants, and telecom facilities in dozens of countries. On land and at sea, China is using infrastructure projects to gain strong footholds and exercise profound influence on trade and foreign policy.

"One Belt, One Road" is a development program encompassing land routes from western China through Central Asia to the Middle East and Europe. Sea routes run from southern China across the Indian Ocean and into the Mediterranean Sea. Maritime projects include not just new ports, but also ships and cargo facilities.

Propelled by modern infrastructure, trade in this vast region could reach staggering new dimensions. The trade paths touch the world's most vibrant emerging markets and many of its wealthiest established markets. Dozens of countries have joined the "One Belt, One Road" initiative in some way. China says it has already spent $1 trillion, and promises to spend much more.

China's President Xi Jinping signaled his ambitions upon taking office in 2013. The plans have taken form over the past four years, drawing added momentum from a perceived U.S. retreat. Some analysts say China's aims are "imperialist," a thinly veiled effort to counter Western military influence, but none doubt their potential to cement a central position in global trade.

The "One Belt, One Road" formula is straightforward and twofold: Expand foreign markets to employ Chinese nationals and sell products that domestic markets alone will not consume; and dominate world infrastructure design and construction markets, focused on strategic locations that facilitate trade and improve military position.

The now-abandoned Trans-Pacific Partnership (TPP) may have offered a Western alternative to China's plan. Designed mostly to enhance U.S. influence in East Asia, the TPP would have created a free-trade pact for nearly half of the world's economic production while applying Western labor and environmental norms. But in early 2017, the U.S. administration canceled the pact, claiming that it hurt U.S. business and labor. China has picked up the slack.

Architects will almost certainly feel the impact as U.S. engagement wanes in Pacific Rim markets. China may have been reluctant to retain American firms for expansion projects, but—as an interloper to what would have been the largest global trade deal in history—it would have faced some pressure to involve firms from other countries in these huge projects and their many needed ancillary buildings. Now there is little incentive to share.

Programs similar to "One Belt, One Road" are afoot in Africa and South America, where China is building power plants, dams, housing, and factories—mostly employing its own nationals and state-owned companies. Such investments will pay lasting dividends, as host countries turn to China for maintenance, repairs, and upgrades. China is also investing heavily in renewable energy systems, and leads global solar panel manufacturing.

Couldn't U.S. infrastructure policies seek to export our know-how and technology? Couldn't we move along our natural trade routes—essentially south to Mexico and north to Canada by road and by rail, but nearly everywhere by sea and by air? Couldn't excellent buildings form an element of our efforts to promote trade and influence? Do we really want to cede the international market space by default? **AIA**

Thomas Vonier, FAIA
2017 AIA President

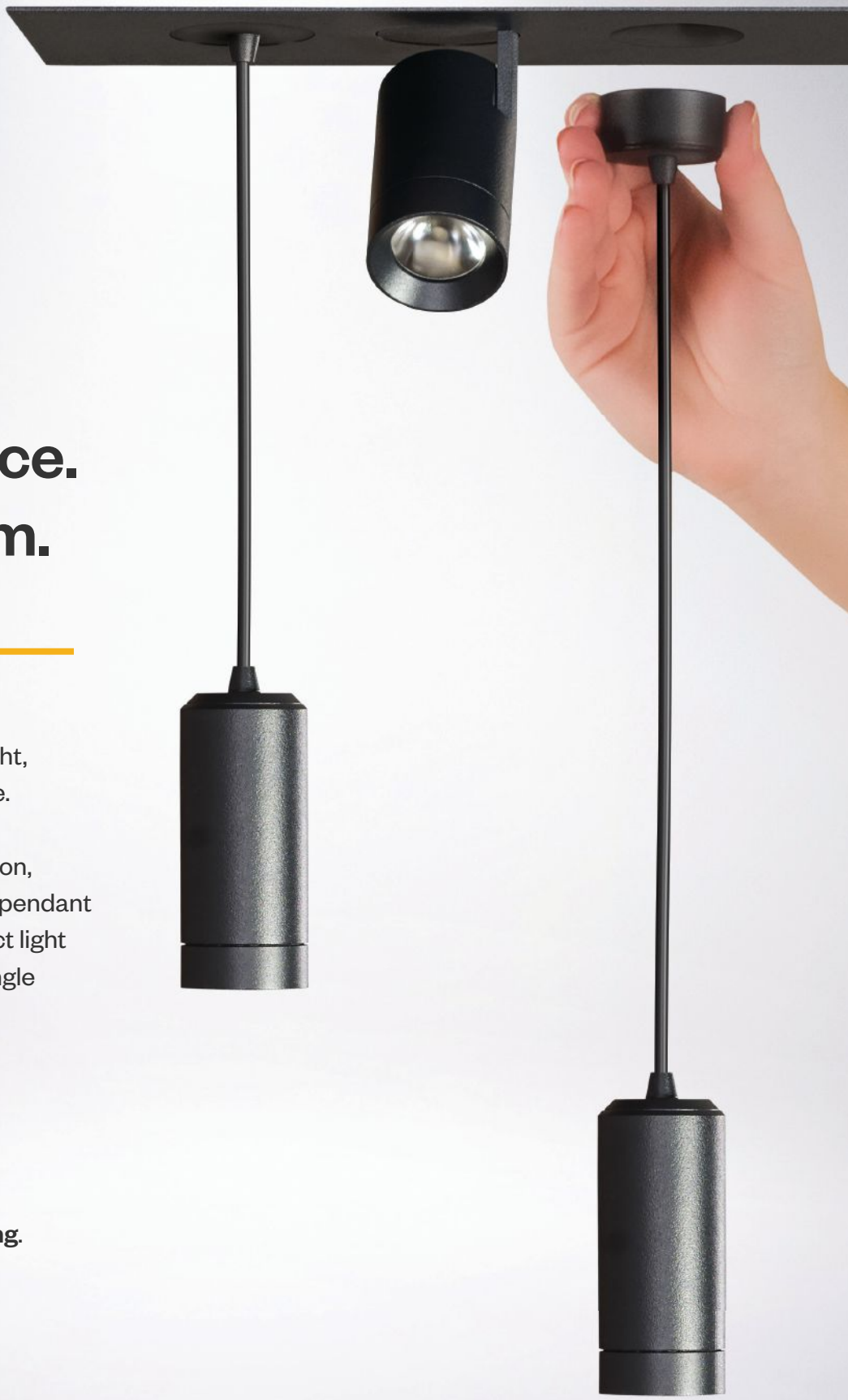
Instant ambience.
Pure magnetism.

Cynch, the attractive, versatile LED light, transforms the ambience of any venue.

With one pull on its magnetic connection, Cynch easily switches from accent to pendant and back again. The elegantly compact light is offered in flush or semi-recessed single or multiple configurations.

For more information,
visit **amerlux.com/cynch**.

Follow us on Twitter **@AmerluxLighting**.



amerlux
Passion. Power. Performance.

Cynch Mounting Options

Single
Round or
Square

Multiple
Semi-recessed
or Flush

Every Dri-Design panel is carefully manufactured – created without ACM, MCM, or any composite materials. Each Dri-Design product is a single-skin, non-combustible metal panel.

INSPIRED. EXPRESSIVE. EXTERIORS.

Dri-Design Metal Wall Panels with new Aluvium finish express not only a new look, but also a new feel. This advanced paint technique imparts a distinctive texture during the finishing process, which has both a unique tactile expression, as well as a visually matte appearance. Available in a nearly endless color palette, this paint still achieves the highest levels of performance in an exterior environment.

- No sealants, gaskets or butyl tape means no streaking and no maintenance for owners.
- Not laminated or a composite material, so panels will never delaminate.
- At Dri-Design, we have a strict policy of recycling and creating products that the world can live with.
- Fully tested to exceed ASTM standards and the latest AAMA 508-07.
- Available in a variety of materials and colors.

dri-design®
WALL PANEL SYSTEM

616.355.2970 | DRI-DESIGN.COM

DMACC Culinary Institute
Shive-Hattery Architecture

IVY LEAGUE ADMISSION

Leverett House's McKinlock Hall,
Harvard University, Cambridge, MA

Like students at Ivy League universities,
Ellison commercial entry doors are the best in their class.
That's why they're installed on campus buildings at
America's top institutions of higher learning.

Custom designed. Precision hand-crafted.
Near effortless operation.
Unequaled longevity. Very smart.

Ellison
CUSTOM CRAFTED BALANCED DOORS

ellisonbronze.com

— Made in the U.S.A. since 1914 —

Sundara Drift Double Basin in White paired with the Nachi Series™ Sensor Faucet and Soap Dispenser

THE SUNDARA™ HANDWASHING SYSTEM

Behold the Balance of Brawn, Brains & Beauty

Influenced by architects and crafted by audacious industrial designers, we've unified seamless countertops, basins, faucets, and soap dispensers for a modern concept that elevates the restroom experience. And with Zurn One, a system that streamlines the restroom ecosystem through a single-source manufacturer, we've reduced installation time, increased effectiveness, while maintaining reliability.

Learn more at zurn.com/sundara

ZURN®

ZURN.COM **US** 1.855.ONE.ZURN **CANADA** 1.905.405.8272

“At no time since the crumbling of the modern movement a half-century ago … have the changes to architectural education come so quickly and unpredictably.”

The Future of Architecture Education by Christopher Hawthorne

At the beginning of the year, I began writing a weekly column in the Sunday arts section of the *Los Angeles Times*, where I've been the architecture critic since 2004. I started the column, called Building Type, in part because I wanted to cover more critical territory; at the end of a typical year there is always at least a small handful of significant buildings, exhibitions, and books that I feel guilty about having left uncovered. The world that architecture touches on is huge, and in some basic way I wanted to visit more of it.

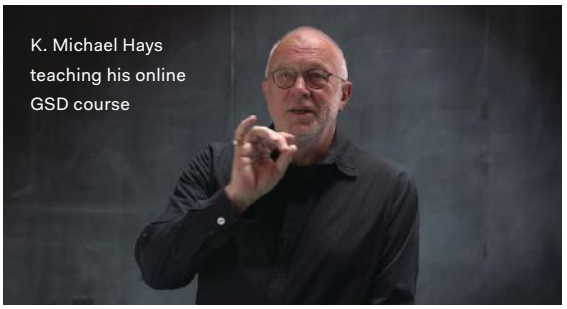
I also figured that at some point, once I'd published enough columns, I'd be able to look back and see certain themes emerging as if on their own—that the columns, in the aggregate, might be an effective instrument to detect or measure changes in the profession. After eight months and more than 30 columns, this has turned out to be the case. And the idea that has presented itself more strongly than any other—and there hasn't been a close second—is that architectural education in this country is at the moment in radical flux.

About a half-dozen of my columns have touched on this idea in one way or another. I've interviewed a number of architecture deans. I wrote about a memoir on race and the Ivy League. And—sort of the way George Plimpton once suited up for preseason camp with the Detroit Lions, except in my case relying on an iPad instead of shoulder pads—I enrolled in a pair of online architecture courses, one offered by the Harvard Graduate School of Design (GSD) and the other, starring Frank Gehry, FAIA, by the sleek online platform MasterClass.

What I learned in the writing of those columns is that the combination of new technology, changing demographics, and shifting philosophical priorities is fundamentally reshaping architectural education. (I've also been watching the emergence of a new tuition-free architecture school in Los Angeles.) The field is democratizing itself and having an identity crisis at the same time. In fact, at no time since the crumbling of the modern movement a half-century ago, an upheaval that happened to coincide with the rise of the counterculture and protests against the Vietnam War, have the changes to architectural education come so quickly and unpredictably.

The Absence of Activism

What does it mean to be an American architecture student? For a not-insubstantial portion of the country's history, the answer to that question was connected in some basic way with amateurism, with the acquisition of knowledge in a haphazard or at least an idiosyncratic way. Thomas Jefferson studied at



K. Michael Hays teaching his online GSD course

William & Mary but gained his architectural knowledge through his library and sharpened his appreciation for Neoclassicism while he serving as ambassador to France. For his generation and many that followed, architecture was something that you learned less in school than in life. These days you might say the opposite is true: architecture students now front-load the technical and digital parts of their educations and pick up the practical and especially the political experience after they leave school. They also, like many college students these days, define themselves at least in part as consumers. They know exactly how much they (or their parents) are paying for their architectural training. They are accustomed to assigning stars to their Uber drivers and complaining about slow service at the Thai place on Yelp. They treat architecture school the same way.

"There are times when I wish there were a little more activism," Ingalill Wahlroos-Ritter, AIA, the ambitious and energetic new architecture dean at Woodbury University in L.A.'s San Fernando Valley, told me over the summer. "And yet I have also realized that students today, they're raising families, and they're supporting their parents, or they're far from home and coming from places of conflict. They're here very specifically seeking a professional degree, and they're very focused on that." This is particularly true at Woodbury, where many students (reflecting the L.A. population as a whole) are the children of immigrants.

Woodbury is also one of a growing handful of universities that have signed on to a program to integrate the licensing process with architectural education, which Wahlroos-Ritter sees as part of the school's ethical responsibility to help students keep their debt low and make them as employable as soon as possible: "The idea is that if they complete the program they can get licensed upon graduation, which makes them that much more marketable."

Her own experience as an architecture student at the University of California, Los Angeles, she said, had been very different—more actively political. But at Woodbury, where a full 80 percent of students receive

DUROPAL
PFLEIDERER

Give your best ideas
the finishing touch
they deserve

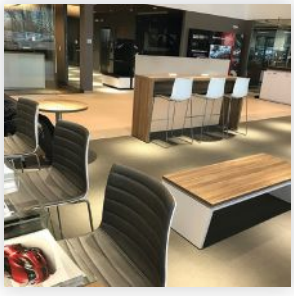
DUROPAL Gives You the Design Edge

When your designs stand out, so does your firm. With DUROPAL, a new line of HPL laminates from I 3 Surfaces, art and science come together to give you virtually unlimited design possibilities. These highly durable and unique finishes are engineered to help you create a competitive edge for your firm with designs that don't just meet expectations, but exceed them.

DUROPAL's 300 decorative laminate collection and 14 different finishes available, provides unlimited color and texture combinations to customize your designs.

DUROPAL microPLUS® antibacterial laminates delivers easy-to-clean, hygienic surfaces where you need them most.

DUROPAL XTREME MATT® is ideal for high usage solutions with its fingerprint-proof surfaces.



DUROPAL helps you realize your best design concepts and inspire new ones.

Request a Free Sample

View Creative Solutions

Request an in Person Consultation

To get free DUROPAL samples and downloads, visit www.I3Surfaces.com or call 888-975-7483.

I 3 Surfaces®
AUTHORIZED IMPORTER/DISTRIBUTOR FOR: PFLEIDERER

some kind of aid, the concerns are decidedly pragmatic. "My generation, it was apartheid. It was UC [schools] have to divest from oil. These students are facing very real problems in their own lives."

That level of pragmatism can be a good thing: After all, architecture is nothing if not a pragmatic discipline. But at many leading schools, the detachment from the political has been less about the pressing needs of the outside world and more about a pedagogical focus on insularity, on treating architecture school as a protected place with its own customs, language, and protocols. That approach, dominant for a generation at many of these schools, might be fading fast now that a new generation of leadership is taking over, but it continues to color the way that many architecture students are introduced to the field.

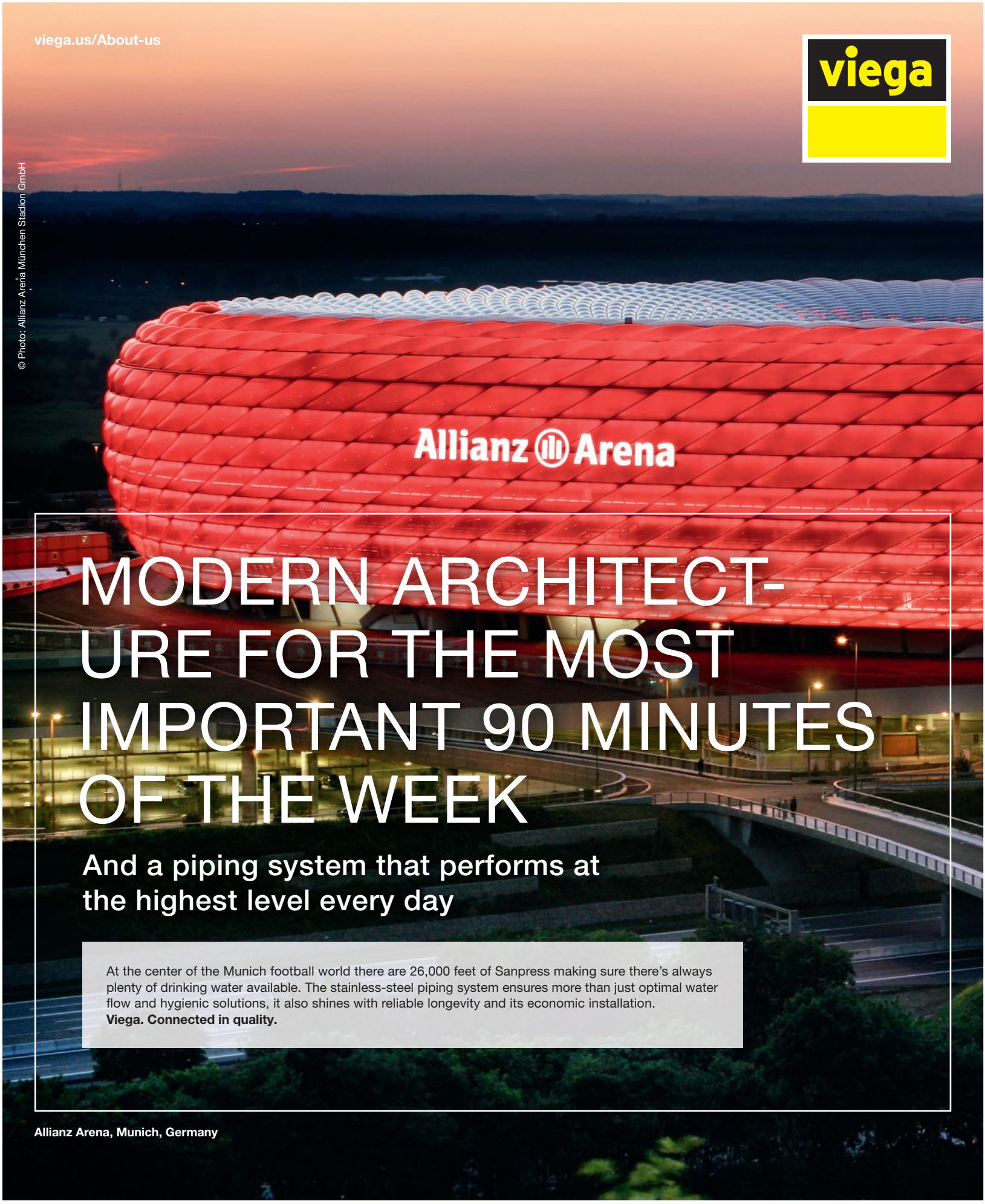
Online with Hays and Gehry

A case in point is "The Architectural Imagination," a free course developed largely by K. Michael Hays, a longtime professor of theory at the GSD, that represents the school's first foray into online education. In the first couple of "modules," to borrow the language of the course, Hays was clearly making an effort to be accessible; his introduction to architecture theory was clear and lucid, and he showed some real charisma in front of the camera. But over time, the old Hays began slowly to re-emerge: he slipped back into old habits, into jargon and opaque, if not twisted, logic. And from the beginning a certain insularity was wrapped into the syllabus: Much of the reading was by Hays himself, a figure who—to put it politely—is not known for his riveting prose.

After I wrote a column pointing out what I saw as the flaws of the Hays approach—the way, primarily, it promised a new kind of GSD, rebuilt for the digital age, but instead delivered more of the same—the professor responded energetically. A few days later, in an interview with the website Archinect, he had this to say about "the vexed notion of architecture's autonomy": "Critics have completely misconstrued the argument. The autonomy thesis asks the question: Does architecture engage society, and if so, does it simply reflect its technological and social determinants or does it contradict, distort, resist, compensate, or in some way reconstruct those determinants? The premise of this course is that architecture is deeply embedded in history and society, but it represents social values in its own architectural way."

An entirely different approach, meanwhile, has shaped Gehry's offering for MasterClass. The course—"Frank Gehry Teaches Architecture and Design"—costs $90 (for a promised total of 17 sessions, only five of

viega.us/About-us



MODERN ARCHITECTURE FOR THE MOST IMPORTANT 90 MINUTES OF THE WEEK

And a piping system that performs at the highest level every day

At the center of the Munich football world there are 26,000 feet of Sanpress making sure there's always plenty of drinking water available. The stainless-steel piping system ensures more than just optimal water flow and hygienic solutions, it also shines with reliable longevity and its economic installation.
Viega. Connected in quality.

Allianz Arena, Munich, Germany

which are available as I write this). The high price reduces the reach of the course but also helps provide a glossy level of production values. Gehry presides over a set, inside a warehouse, that is dramatically lit and decorated with models of his most famous projects sitting atop packing crates. Gehry is his typical self, which is to say he is the anti-Hays, a figure eager to connect with his audience and to hide his genuine intellectualism behind an aw-shucks persona. Still, despite the fact that I know Gehry and his work well,

> I closed the MasterClass tab wishing that the architecture world could find some middle ground between the Gehry offering and the Hays one, a digital course that is substantial and rigorous yet doesn't treat architecture as a private club.

I surprised myself by learning a few things, including the fact that the architect considered leaving Los Angeles and moving his office to the East Coast two decades ago, as repeated delays and money problems with the Walt Disney Concert Hall left him concerned that the project would never be completed.

I closed the MasterClass tab wishing that the online architecture world could find some middle ground between the Gehry offering and the Hays one, a digital course that is substantial and rigorous yet doesn't treat architecture as a private club where you have to learn a series of secret handshakes before you learn anything else. At the same time, to the degree that both of those online courses are largely disinterested in politics, race, or inequality—and how those subjects relate to architecture—their hosts date themselves. (Gehry is 88, Hays 64.) For politics has begun to move (or move back, as we'll see) to the very center of architectural education.

The Citizen Architect

This was a central theme in the conversation I had with the new architecture dean at the University of Southern California, Milton Curry. An African-American scholar who comes to Los Angeles from an associate dean post at the University of Michigan's Taubman College of Architecture and Urban Planning, Curry told me his central goal at USC is to educate a new generation of "citizen architects" capable of shaping not just

NEWBRICK™
by dryvit

Customer Satisfaction Made Easy

Our *CableRail* stainless steel cables are a great choice for your customers who are looking for a view-friendly railing infill option that's attractive, durable, and ultra-low maintenance. Services such as shop drawings and engineering reports combined with our packaged cable assemblies and automatic-locking *Quick-Connect*® fittings will make design, preparation, and installation a breeze.

CABLE·RAIL® by feeney®

RECYCLED CONTENT LEED®

Free catalog and dealer locations
1-800-888-2418
or visit
www.feeney15.com

feeney®
makes it easy

Photo courtesy of Decks by Kiefer

Sharon E. Sutton discussing her book *When Ivory Towers Were Black*

buildings but civic life. He also said that bringing diversity to the ranks of architecture students has to do with more than just race; he said he wants to encourage a range of "students who may not have considered architecture. It's more than identifying talent. It's about cultivating potential. We have to provide the pathway for those students—not only underrepresented minorities but lower-income students, students from rural areas." I can't tell you how much of a shift Curry represents—even in simply rhetorical terms—at USC. For a full decade, under his predecessor Qingyun Ma, the words "diversity," "engagement," and "citizenship" were barely uttered; the focus instead was on a global perspective (Ma's firm is based in Shanghai) and helping students polish their digital skills.

Architectural education is a pendulum, and longtime observers of the field will see in the new interest in political engagement clear reminders of the tumult of the late 1960s. In that sense, *When Ivory Towers Were Black: A Story about Race in America's Cities and Universities* (Oxford University Press, 2017), by Sharon E. Sutton, FAIA, professor emerita at the University of Washington, is compelling both as a memoir of distant battles and a primer for the contemporary moment. Sutton writes about how intense student protests at Columbia University helped pave the way for a successful—if sadly short-lived—effort to diversify the student body in architecture and planning. Sutton enrolled at Columbia in 1968, the same year civil rights leader Whitney Young, the executive director of the National Urban League, gave a fire-breathing keynote address at the AIA Convention arguing that architects couldn't sidestep at least some "responsibility for the mess we are in in terms of the white noose around the central city." Her book at its heart is the chronicle of a campaign at Columbia, funded by the Ford

Foundation, to boost the number of students of color. That campaign made huge progress—the number of nonwhite students increased eightfold between 1968 and 1971, from 2 percent of the total to 16 percent—but couldn't sustain itself. A change in Columbia leadership and a financial crisis in New York short-circuited the effort. The number of graduates of color from Columbia's architecture school peaked in 1973 and then, depressingly, slid back essentially to where it had been a decade earlier. Still, Sutton recalls the era "as a magical, intoxicating time"—particularly the degree to which architecture school was in those years as politically charged as the rest of American life.

I wonder how the students at the upstart Free School of Architecture (FSA) will look back at their education. Established this year in Los Angeles and directed by Peter Zellner, who taught for several years at the Southern California Institute of Architecture (SCI-Arc), the FSA is dedicated, as its website puts it, to exploring "the edges of architectural education." Its founders appear unfazed by the difficulty that the Cooper Union had maintaining its tuition-free status, though by comparison the FSA's offerings are skeletal; it won't grant degrees. The FSA launched over the summer in the Arts District, on the edge of downtown, with what the school described as "32 post-graduate students and a faculty of 22." The freewheeling approach recalls the beginnings of SCI-Arc, which was founded in 1972 in Santa Monica by a group—including Ray Kappe, FAIA, and a young Thom Mayne, FAIA—splintering off from the architecture department at California State Polytechnic University in nearby Pomona. Whether the FSA will have the staying power of SCI-Arc remains to be seen. By late summer, the school's website had gone largely dormant. Its main sections were empty of content and there were no announcements, at least that I could find, about future sessions.

It's entirely possible that the lull at the FSA will turn out to be temporary. Still, it's a reminder, like Sutton's book, that the democratization of the profession, whatever's driving it from year to year, comes in fits and starts.

Code-Compliant Smoke & Fire Protective Curtains

Open Up Design Possibilities For Architects

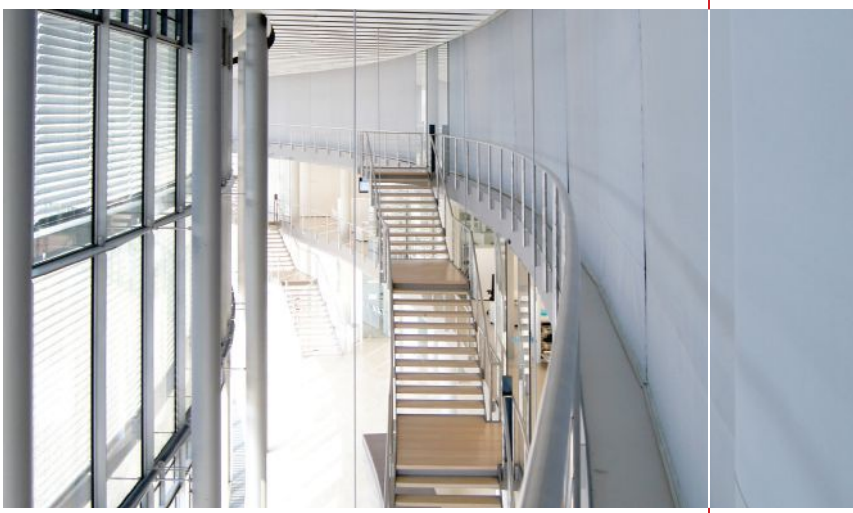
Relatively new to North America, smoke and fire protective curtain assemblies have been used extensively throughout Europe since the 1980's, but the history of this fire protection method can be traced back as far as the 1600's. While these products are not replacements for fire door assemblies used in structural openings, there are a number of applications where smoke and fire protective curtain assemblies can be utilized for a hidden layer of fire protection and interior design flexibility. Test standards and code allowances in the United States have been further developed in recent years, making these products an attractive fire protection solution for building design professionals.

Smoke and fire protective curtains are used to create a nonstructural fire barrier between two areas and offer a more aesthetically pleasing alternative to traditional solutions. Comprised of a flexible fire-resistant fabric that is mounted into a head box, the product can be installed above the ceiling for a completely hidden layer of fire protection. In the event of a fire, the electrically actuated curtain simply lowers upon receiving a signal from a fire detection system to seal off an opening. When deployed, the bottom of the curtain can be weighted to assist with deployment and limit deflection caused by air movement. Curtain products are available in very large sizes to accommodate virtually any size opening.

There are a number of code based applications where smoke and fire protective curtains are well suited to provide a cost effective and aesthetically pleasing level of fire and smoke protection. A summary the compliant applications for smoke and fire protective curtain assemblies is provided below. It should be noted that the ultimate authority for product approval and acceptance lies with the fire protection authority having jurisdiction (AHJ).

Compliant applications for smoke and fire protective curtains

- Draft curtains for escalators, stair openings, and warehouse storage areas.
- Smoke partitions, including opening protectives.
- Elevator hoist-ways to limit smoke migration.
- Opening protectives in corridors that require a 20-minute rating and smoke barriers.
- Atria separation (either vertical or horizontal) to limit interconnection of levels.
- Space separation within a building where non-combustible, non-bearing, interior partitions are required and where combustible curtains/draperies tested in accordance with NFPA 701 would not be appropriate.
- Decorative ceiling designs that allow heat to bank downward to ensure that automatic sprinklers activate properly in the plane of the membrane.



- Proscenium openings
- Service Counter Fire Doors where 20-minute opening protectives are allowed.

When evaluating the use of smoke and fire protective curtain assemblies in commercial buildings, there are specific performance standards to consider when specifying Smoke and Fire Protective Curtains.

- Code Compliance: The use of these products for specific applications should be carefully evaluated against UL10D and UL1784 and other code requirements as outlined above.
- Performance Characteristics: Life-cycle testing data should also be provided; once installed these products should be regularly tested to assure their viability in case of fire. A unit tested weekly would require a 1,000 life-cycle range to last for twenty years.
- Control System Integration: Control systems should be UL listed for code compliance and compatible with the control box supplied with the smoke and fire protective curtain assemblies.
- Aesthetic Characteristics: Careful attention should be paid to the curtain's bottom bar and how flush it sits against the ceiling when fully retracted. Special bottom bar finishes can be specified for an improved appearance.
- Available Options: Options such as sizing, orientation, guide systems, fabric materials, battery back-up, firefighters' override, obstruction monitors, siren/strobe light capabilities and others can provide both system enhancement and overall cost reduction, depending on the situation.

Bilco®

an Amesbury Truth company

Please contact The BILCO Company at colt@bilco.com to receive a copy of our white "Smoke and Fire Protective Curtain Assemblies: Their Expanding Role in the Commercial Construction Market in North America". This paper contains a complete summary of all U.S. codes and standards that are applicable to the use of smoke and fire protective curtains.

Work/Life With A Twist.

Since 1954, Florida Tile has been an innovator, marking many accomplishments, from building the first floor tile plant in the USA to introducing the first digitally printed products with our HDP–High Definition Porcelain® lines. Throughout our history Florida Tile has been a pioneer, but equally important, we have been a guideline for style. Offering products that are both practical and stylish is what we are all about, and tile never looked so good. Please visit us on the web for more about this product and more at www.floridatile.com.

DISTILLERY HDP
High Definition Porcelain®

BY floridatile

floridatile.com

“‘It’s hard to find people, and I know the subs are having a hard time finding crews.’ A further reduction in the construction job force, Marc Padgett says, could be ‘devastating.’”

The Effects of Trump’s Immigration Crackdown by Reed Karaim

Anyone who's honest about construction in America knows that much of what's built in this country is built by people who aren't legally supposed to be here. Claudia, a 46-year-old electrical subcontractor in Dallas, is one of those people. Since entering the United States without authorization 13 years ago from El Salvador, where she studied electrical engineering, Claudia and her husband have worked on buildings of every kind, large and small, residential and commercial.

Now she is wondering how long they can continue. "There are people I know that are afraid to come to work and haven't been going to work," Claudia says. "I'm afraid and my husband is afraid, but we have no other choice. We have children, and we take care of my mother, so we have to keep on working."

The reason for that fear, of course, is the Trump administration's crackdown on undocumented immigrants. While the president has said he's focused on deporting the "bad hombres" (a policy that would largely mirror President Barack Obama's), the statistics indicate something different. In the current administration's first 100 days, arrests of undocumented immigrants jumped 36 percent, according to U.S. Immigration and Customs Enforcement. While three out of four had criminal records, the biggest increase by far came in the arrest of immigrants with no record. Those apprehensions more than doubled as federal agents averaged more than 400 arrests a day.

Simply reciting the statistics, however, feels inadequate. The numbers alone can't convey the thousands of personal stories behind the arrests as well as the growing apprehension and anger in the primarily Latino immigrant community that is being targeted. Federal agents have apprehended a father dropping his children off at school, a man who stopped by court to pay traffic fines, a student who was waiting on a street corner for a friend. They have raided homes and workplaces across the country, including construction sites in the states of Washington and Texas.

Indeed, the administration's policies could have a profound impact on the building industry and everyone working in it, including architects. A growing number of voices have begun to decry the consequences, which could have a devastating effect on an industry that took years to rebound after the Great Recession and is already struggling with a labor shortage.

"Its impact is going to be overwhelming. It'll take a little bit of time. … But ultimately, the ones who are undocumented are going to stop going to work because of fear," says Moises (Moe) Vela Jr., former executive director of the National Association of Hispanic Real Estate Professionals, who also served in the Clinton and Obama administrations. "It doesn't take a rocket scientist or an economist to tell you that if a disproportionate number are immigrants and a portion are undocumented, then ultimately the impact will be felt on the industry and on the economy."

Occupation		Unauthorized immigrants		Lawful immigrants
Total Civilian labor force	Total Workers*	Workers*	Share	Share
Drywall installers, ceiling-tile installers and tapers	160	50	31%	17%
Roofers	240	70	29%	13%
Painters, construction, and maintenance	650	170	26%	18%
Brickmasons, block masons and stonemasons	170	40	25%	14%
Carpet, floor, and tile installers and finishers	170	40	24%	14%
Construction laborers	2,000	425	21%	26%
Carpenters	1,320	220	17%	14%

* In thousands (unless otherwise specified)

SOURCE: PEW RESEARCH CENTER "SIZE OF U.S. UNAUTHORIZED IMMIGRANT WORKFORCE STABLE AFTER THE GREAT RECESSION, APPENDIX D: DETAILED TABLES"

In the U.S., the construction industry is second only to agriculture in its dependence on immigrant labor. Nearly 15 percent of the workforce in construction—about 1.25 million men and women—are undocumented immigrants, according to the Pew Research Center, a nonpartisan think tank. Another 240,000 undocumented immigrants work in a category Pew defines as "installation, maintenance, and repair." The common perception of undocumented construction workers may be of day laborers waiting to be picked up in a parking lot, but in truth they are heavily represented in several skilled building trades. Pew's research estimated that, as of 2014, 31 percent

DELTA

see what Delta can do™

We make the difference for commercial professionals.

The perfect temperature for users.
And a design that's anything but lukewarm.

The new Delta® DEMD-611LF electronic thermostatic faucet seamlessly pairs ASSE 1070-certified technology with sleek, contemporary design. Its above-deck mixing valve makes adjustment easy, and incorporated supply lines allow for quick installation. Learn more about our innovative technologies, styles and support at **DeltaCommercialFaucets.com**

of all drywallers, 29 percent of roofers, 26 percent of painters, and 25 percent of masons are working in the U.S. without legal authorization.

The proportion of undocumented workers is much higher in several parts of the country. "The reality is that in the state of Texas, up to 50 percent of the construction workforce is undocumented," says Jose Garza, executive director of the Workers Defense Project, an organization that works with low-income workers in Austin.

Carlos Martín, a senior fellow at the Urban Institute who focuses on housing and communities, says the lag in collecting and analyzing data means it will probably be the end of the year before the impact of President Donald Trump's policies is documented. But "clearly," he says, "mass deportation is going to have an immediate effect on the construction industry."

Fear in the Labor Force

Many builders and contractors say they are already seeing the effects of Trump's policies. "Have I seen this? Yes, I've seen it. In January, when we all had these raids, that added to that fear. I've seen it in our own city. I've seen it in Dallas. I've seen it in Houston," says Frank Fuentes, chairman of the U.S. Hispanic Contractors Association, based in Austin.

Garza says concerns in Texas have been heightened by SB4, a new state law currently being challenged in court that gives local law officers the right to inquire about the immigration status of anyone they stop. But he adds, "I think it's important to point out that the policies of the Trump administration have absolutely played a role in this."

Salvador Chavarria, owner of Viking Fence in Austin, relies on subcontractors for installation of the fencing the company manufactures and sells in several Texas markets. He uses E-Verify for his own employees, but says, "We were hearing reports from our subcontractors that there were raids and their people were being stopped and arrested, and, basically, it was bringing a lot of fear into their labor force. So, yes, they have been impacted by it directly."

As his subcontractors struggle to keep or find employees in the current atmosphere, Chavarria says, his company has had to pay more for labor, which has led to raising prices. His lead times have also gone up, and he's had to turn down work.

The effects will ripple across the industry. "One can expect that projects will be shelved or postponed," Martín says. "Things are going to take longer and be more costly to build." Rising housing costs, he adds, could hurt both consumers and the financial sector as fewer eligible homeowners can take out mortgages. Over the longer-term, Martín adds, the impact will depend on the ability of the industry to train replacement workers or rely on increased mechanization to build with fewer people. "It's going to be a weight on the industry," he says. "The question is whether it's going to be an anchor—or just a weight."

The argument for deporting undocumented immigrants without serious criminal records has long been that they are taking jobs from American citizens and depressing wages. A spate of recent economic analyses, however, disputes those assertions. A study by economists at the University of California, Davis and Colgate University found that in states with an influx of immigrants between 1960 and 2000, native-born workers tended to shift out of the manual labor taken by the newcomers into better-paying jobs, raising their incomes. Another study found that when industries lost immigrant labor they tended to invest in increased mechanization rather than hire native-born workers at higher salaries. Some economists say immigrant labor increases economic growth overall, benefiting both immigrants and the native-born. "The average American worker is more likely to lose than to gain from immigration restrictions," Giovanni Peri, an economist at UC Davis, told *The New York Times*.

Economic studies aside, contractors say the industry's dependence on immigrant labor, both documented and undocumented, is a reflection of a stark reality. "Americans don't want to do these jobs," Chavarria says.

A major home builder who did not want to be identified says his company has found that the native-born workers who are willing to take jobs tend to be less reliable. "They have problems. They have no driver's licenses. Their grandmother died for the fifth time. These Spanish guys, they just show up to work every day, daylight till work ends, at least five or six days a week. You just don't have problems. All they want to do is work. You need people like that," he says.

The same builder also says the current system of enforcement allows contractors to maintain a necessary fiction. "You verify your subcontractors, and then they're providing assurance about their employees," he says. "So, as far you know, they're all legal. But you and I know they're not all legal."

The most recent survey by the National Association of Home Builders, released in August, indicated that builders are already struggling with a growing shortage of workers and subcontractors. About three-fourths of builders surveyed reported shortages in carpenters and framers, more than six in 10 said they were facing a shortage of masons and concrete layers, while a similar percentage said they needed more drywallers. Overall,

Dryer Vents

Model:**SB-P**
4”&6” Aluminum

Model:**SFB-P**
4”&6” Aluminum

Model:**SFZC** 4”&6” Aluminum

Model:**RCC-S** 4”&6” Stainless Steel

Vent Caps

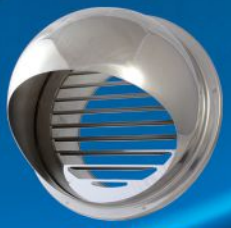
Model:**SFZ**
4”&6”
Aluminum

Model:**SX**
3”-8”
Aluminum

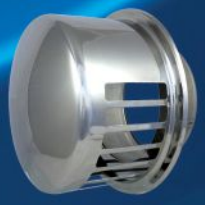
Model:**SFX**
3”-12”
Aluminum

Model:**KX**
3”-6”
Aluminum

Model:**SX-S**
4”&6”
Stainless Steel



Model:**SFX-S**
4”&6”
Stainless Steel



Model:**RCA-S**
4”&6”
Stainless Steel

SEIHO® www.seiho.com

Seiho International,Inc. 120 W.Colorado Blvd. Pasadena, CA Tel: (626) 395-7299 Fax:(626)395-7290 info@seiho.com

SET FOOT ON TIMELESS TERRAZZO TILE

Tectura Designs is the only manufacturer of cementitious terrazzo tile in the USA. Our timeless tile offers a strong and elegant low-maintenance solution for high-traffic areas: Distinguished colors and patterns, base and transition tiles to match, exquisite craftsmanship and effortless installation.

TECTURA designs®

A WAUSAU TILE INC. BRAND

Discover the possibilities at **TecturaDesigns.com**

they reported significant shortages of workers in 15 different trades. In every case, the situation was worse when it came to finding subcontractors compared to workers hired directly by the company.

Marc Padgett, president and CEO of Summit Contracting Group, a large Florida-based contractor specializing in multifamily construction, believes the shortfall is partly a lingering effect of the Great Recession, when the housing collapse led laid-off workers to seek employment elsewhere. "It's tougher to get bigger crews like we had 10 years ago. If I had a 30-man electrical crew [then], now we have a 20-man electrical crew. Everybody's spread a little more thin," Padgett says. "It's hard to find people, and I know the subs are having a hard time finding crews." A further reduction in the job force, he says, could be "devastating."

Yet, in addition to its crackdown on undocumented immigration, the Trump administration is also backing legislation in Congress that would cut legal immigration by half, favoring individuals with documented skills, education, and fluency with English. The Urban Institute's Martín says the construction

> "We need to figure this out. We need to get these people over here, need to pay them more money, need to collect their taxes, need to let them go home and come back legally."
>
> —John Meyer, project manager, Cobre Building Systems

trades do not appear to fall under the bill's definition of skilled workers. The Pew Research Center estimates that authorized immigrants make up another 12 percent of the construction workforce. Which means that if the legislation passes, the worker shortage could be even more severe.

A Recurring Issue

In a way, this is an old story. "Historically, immigration has always played a key role in construction labor," notes Martín. German immigrants formed one of the early carpenters' unions in the 19th century, he says, and Italian and Irish newcomers organized similar groups early in the 20th century. The hard, physical work that comes with building has always been one of the grittier paths of entry into the American dream.

America also has a history of turning against these workers in times of economic stress. Following heavy immigration in the early 1900s, the United

Mexicans sponsored by the Bracero Program arriving in 1943

EVERETT COLLECTION

States enacted severe limits on who could enter the country. In the 1950s, a reaction against Mexican guest workers in the United States—many of whom came legally under the Bracero Program enacted to supply agriculture with much-needed labor during World War II—led to "Operation Wetback," in which thousands of Hispanics were rounded up and deported to Mexico.

Some of those taken across the border were either U.S. citizens or here legally, according to historians. Eric Rodriguez, vice president of the office of research advocacy and legislation for the Latino advocacy group UnidosUS (formerly the National Council of La Raza), says the Trump administration's hostility toward immigrants once again leaves the entire Latino community feeling more vulnerable. Among undocumented laborers, he says, "We're seeing things like people who get hurt or injured on the job not claiming benefits because they're afraid of what would happen to them if they did."

Wage theft has long been an issue among undocumented workers, who know they're vulnerable and often won't report the crime. But in March, multiple current and former U.S. Department of Labor officials, speaking off the record, told British newspaper *The Guardian* that now some undocumented immigrants are even refusing to accept back pay for fear it will allow them to be traced. Immigrants are also increasingly reluctant to cooperate with Labor Department investigators, the sources said, even though the department does not inquire into the immigration status of workers when looking into complaints. "They're not just refusing to talk to us. They're running away from us," one investigator told the newspaper.

Many of the builders I interviewed for this story believe it would be best for everyone if America's need for foreign labor were acknowledged and legally regulated. "We need to figure this out," says John Meyer, a project manager for Cobre Building Systems in Tucson, Ariz. "We need to get these people over here,

SEE THE BEAUTY IN OUR

REFLECTION

IT 'S A NEW DAY FOR CONCRETE MASONRY

With a highly polished finish that's unsurpassed in the industry, Reflective Series concrete masonry units create an impressive and resilient application for both interior and exterior use.

It might look like granite or marble—but at half the cost and a monolithic appearance without restrictive tile cladding, they offer exceptional value.

Visit edillon.com or call (800) 234-8970 to learn more and request a sample.

EDILLON & COMPANY™

AN AMERICAN OWNED COMPANY SINCE 1868

need to pay them more money, need to collect their taxes, need to let them go home and come back legally. Not only would it help us in all the trades, in labor, it would save the country so much money—just look at what we're spending protecting the border."

Architects' Complicity

What is less certain is the level of concern among architects. "For many of us involved in the design of cities, we understand that the history of the city has always depended on immigrant labor. So instead of rejecting immigrants, the policy goal should be how to better integrate them," says Teddy Cruz, a director of the University of California, San Diego's Cross-Border Initiative, which studies trans-border culture.

Cruz believes many of his colleagues do not share the same concern. "In general, there is not that much awareness, and whenever there is, there is not enough will to challenge it," he says "Architects … are often complicit in unjust policy through mere acquiescence."

Peggy Deamer, a professor of architecture at Yale University and co-founder of the Architecture Lobby, a nonprofit dedicated to raising awareness of labor issues among architects, believes an architect's contractual relationship with property owners means they are distanced from concern about the workers on projects. She also believes a fundamental class issue comes into play. "Architects don't recognize themselves as workers, and if you don't recognize yourself as a worker, you don't recognize yourself as having affinity with other workers," she says. "We think of ourselves as the creative class … and because we see ourselves as artists and creators, somehow we see ourselves outside the economy."

She fears this perspective could keep architects from recognizing the implications of President Trump's immigration crackdown on the building industry and their own work. "I think the mindset, the ideology, would disconnect a slowdown from architectural responsibility, concern, or activism," Deamer says. "It would be seen as, 'Oh, this is another slump in the economy; we've weathered these slumps before.'"

It appears that the slump, or at least the start of a growing worker shortage, is already beginning. "Right now, we're seeing less undocumented workers on the sites that we're working on," says Claudia, the Dallas-based subcontractor. "Usually just two to four. You used to see a lot more workers that were undocumented."

Texas has plenty of work for electrical subcontractors, but state law SB4 and the aggressive immigration raids conducted by federal agents have Claudia and her husband pondering their future, and the possibility of finding a less hostile environment somewhere else. "We have our plan B," she says. "We're leaving Texas."

A PRODUCT PORTFOLIO AS DIVERSE AS YOUR NEEDS.

When you need budget-friendly options, energy efficiency, attention to aesthetics, architectural authenticity, or all of the above, think Andersen.

Andersen is the most trusted and recognized brand of windows and patio doors among contractors.*

Andersen WINDOWS • DOORS

*Based on 2016 survey of trade contractors. "Andersen" and all other marks where denoted are trademarks of Andersen Corporation. MS1708_1084

“I think there is a concern that the new interpretation will be seen as the real thing. It’s an age-old discussion in preservation. How far do you take it?”

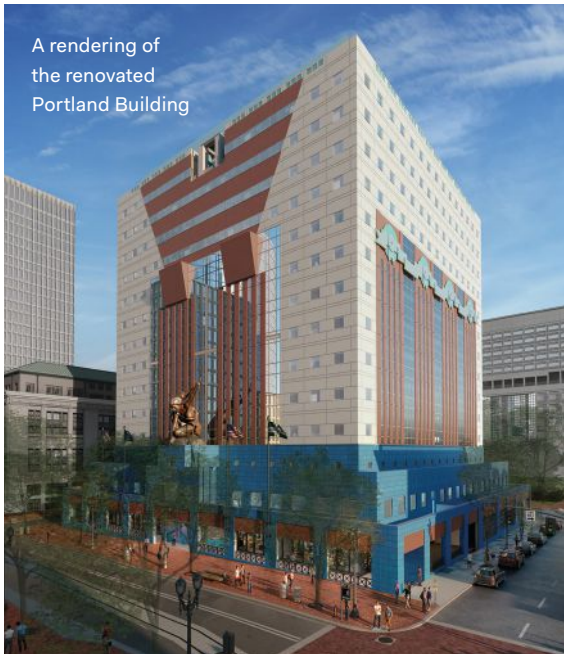
The Revival of the Portland Building by Brian Libby

On a sunny August afternoon, Carla Weinheimer, AIA, a senior associate at DLR Group, is beaming. She's standing in front of a photograph inside the Michael Graves–designed Portland Public Service Building in Oregon. The photo, more than 30 years old, shows the revered Portlandia statue being transported down the Willamette River, destined to be mounted over the building's entrance. "Look at all these people celebrating, on both sides of the river," she says.

It might be a sunny day, but you wouldn't know it standing inside the Portland Building. In the lobby, there's nearly a complete absence of natural light. That's one of the reasons that DLR Group, working with the City of Portland, has embarked on a $195 million restoration of the 15-story municipal office structure. The other reasons: The building has been plagued by water leaks, structural issues, and mechanical deficiencies.

Both DLR Group and the city argue that the restoration will help realize Graves' original vision for the project. The first major building in the United States designed in a postmodern style, the Portland Building suffered from extensive value-engineering. "It's pretty darn exciting to be part of remedying all of the problems," Weinheimer says. "It brings up the building to what it needs to be."

From the beginning, the Portland Building has been a lightning rod for controversy, inspiring both love and hatred among residents for its provocatively colorful, flamboyantly neo-historic design. Now the renovation has inspired a fresh wave of criticism, especially from preservationists who fear that the proposed changes will get the building delisted from the National Register of Historic Places.



A rendering of the renovated Portland Building

COURTESY DLR GROUP

A Long-Term Solution

When the Portland Building opened in 1982, it was a defining moment for the city, which had historically shied away from commissioning ambitious, trophy-like buildings. Then-Mayor Frank Ivancie even predicted Graves' building would come to be regarded as Portland's Eiffel Tower.

The project added a welcome dose of color and whimsy to the city: It looks like a giant wrapped birthday present, complete with faux garlands affixed to two sides of its exterior. But the mayor's prediction never came to pass. The local design community largely derided the project, most notably the city's favorite architectural son, midcentury master Pietro Belluschi. He called it an "oversized beribboned Christmas package" and warned that "today's shock value may well be tomorrow's drag." It didn't help matters that the building was built cheaply, with a budget of $29 million (about $74 million today, adjusted for inflation).

The renovation will give the building a new aluminum exterior and rainscreen over-cladding that will cover the original concrete-and-tile façade to reduce leaks and the corresponding façade erosion. "This is a long-term solution for this project," says Kristin Wells, a construction project manager for the city. "In our kickoff meeting, the first thing we said was, 'We will absolutely solve our envelope issues—period.'"

The building's dark glass will be replaced with clear glazing, and retail spaces in the ground-floor loggias will be removed to expand (and daylight) the lobby. Mechanical equipment will be moved from its original second-floor location to the roof to improve the quality of air intake. Even the façade tile is being switched out for a double-sized replacement. "It's not a rote way of doing it," Wells says. "But it's the right way to do this."

Graves Rallies Support

Three years ago, the fate of the Portland Building was largely uncertain. "My reaction is we should basically tear it down and build something new," city council member Dan Saltzman told *The Oregonian* in January 2014; he went on to call the building "a nightmare for people who work there."

The possibility of demolition prompted Graves to return to Portland, despite his declining health (he passed away about a year later). Speaking to a packed audience at the Portland Art Museum, Graves joked that he'd expected one of the city's many food trucks

YOU BRING THE INSPIRATION

We help you make it a reality

For an architect, it all comes down to details. PPG PAINTS™ offers an unsurpassed selection of products, colors and tools to help bring every bit of your vision to life.

Our Paint YOUR PRIDE

LEARN MORE AT PPGPAINTS.COM/ARCHITECT.

PPG PAINTS™

to park outside, in order to sell tomatoes that attendees could hurl at him on stage. Still, he argued that the project should be saved. "I would be devastated, I know, if any of my buildings came down," he told me after the event, "not just in my lifetime but ever. They are your children and you love them all." Graves gave his blessing to a restoration that would substantially alter the building, including switching out the glass and changing the covered loggias on the ground floor.

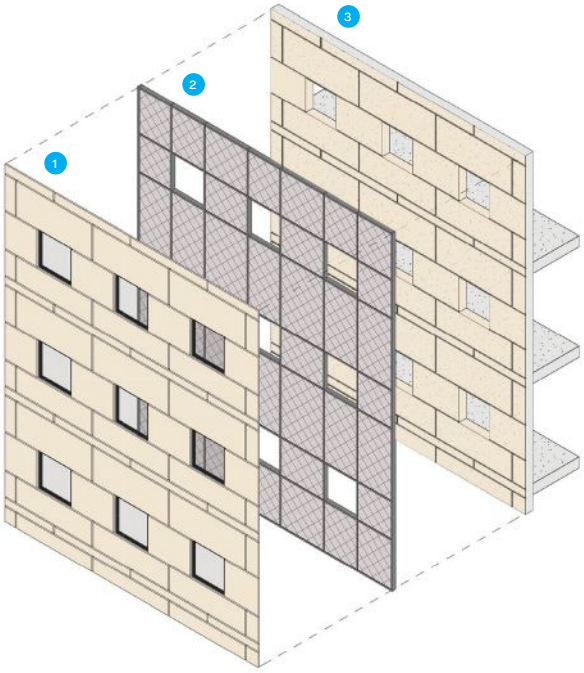
"It was a building built cheaply and had a lot of problems. Michael knew that," says Patrick Burke, AIA, a principal with Michael Graves Architecture & Design. "Michael's intent was shapes, colors. In truth, he loved working with nice materials when we had higher budgets. But he was also very quick to do what he needed to do to be within budgets. Michael would have been open to talking about other materials."

Graves initially had chosen a glazed terra-cotta tile façade. "He was so excited," Burke recalls. "He thought it was going to be this sparkly building in a rainy climate. Then the contractors told him, 'It's not going to happen' because of budget." The city also rejected Graves' suggestion of stucco because of maintenance concerns, instead proposing painted concrete. "Michael said, 'I don't care if we make it out of oatmeal.'"

Violating the Historic Integrity?

Yet the scope of the proposed changes has rankled some preservationists. No one, including the city's Historic Landmarks Commission, which approved the redesign in August, has questioned the new glass, even though it will noticeably alter the building's composition. Much of the façade has tiny square windows. Where glass was used more extensively, in large swaths in the middle of each of the four sides, it usually had spandrel panels behind it, preventing any natural light from entering. The dark glass "actually was a mistake," explains Burke. "[Architect-of-record Emery] Roth put it in, supposedly for energy efficiency. Michael blew up. They said, 'Too late, we bought black glass.'"

The problem has been more with the aluminum over-cladding. In a letter to Ian P. Johnson, the



COURTESY DLR GROUP

Rainscreen curtainwall assembly
1. Panel layer 2. Framing and insulation 3. Existing wall

associate deputy state historic preservation officer for Oregon, Lisa Deline, a reviewer with the National Register of Historic Places, wrote that the over-cladding, "if undertaken, would destroy the historic integrity of the building and necessitate its removal from the National Register."

Local architect Peter Meijer wrote the building's National Register application (because of its significance, the project was listed in 2011, well before the usual 50-year benchmark for being deemed historic). Meijer believes the over-cladding is a matter of anti-leak overzealousness. "What the city said was, 'We want you to give us a warranty for 10 years.' A repair of the existing façade will get you a warranty for three to five years, depending on the sealant, but not a 10-year warranty. The city raised the bar on their expectations to the point where there is only one solution: to completely cover it up with a brand new skin. But metal panels will really never be able to have the same look as a painted concrete building." Meijer also believes the over-cladding will create more of a tunnel effect for the

already-small windows, thereby eliminating the gains in natural light made by swapping out the dark glass.

DLR Group and the city both insist that adding the rainscreen was the only viable solution. "We currently have tiles adhered directly to the concrete. No one in the city believes it's a condition we can replicate," Weinheimer says. "It became clear to everyone, every consultant, that tile replication needed to happen in a rainscreen format to be safe and to perform over time." Once they decided to use a rainscreen over the tiled portions of the façade, doing the same for the concrete portions was a matter of performance and aesthetic continuity: keeping the façade's depth consistent.

The city's façade consultant for the project, Michael D. Lewis, AIA, of Ohio-based Façade Forensics, supported the approach. In a letter to the city, Lewis wrote that the building's defects "could not be corrected by restoration-type repairs limited to traditional preservation techniques."

Recently, DLR Group did a mock-up, affixing an aluminum panel to the building's exterior. To a surprising degree, it resembled the original façade, which might be problematic in its own right. "I think where the discussion starts with the Portland Building is the idea of over-cladding and calling it preservation," says Theo Prudon, FAIA, president of Docomomo US. "You could call it interpretive restoration, I suppose. But interpretations of history are always problematic. When you go into a historic building, there's a process of making clear what you did is new. I think there is a concern that the new interpretation will be seen as the real thing. It's an age-old discussion in preservation. How far do you take it?"

Patrick Burke believes that the answer revolves largely around the needs of the workers in the building. "You have an obligation to the users. I think you should let the buildings live. Michael was asked that question many times. He said, 'Do it. I'd rather see my buildings get updated than be out of date and out of step.'"

The Portland City Council is expected to issue final approvals for the restoration this month. In a way, the project will itself be postmodern. By blurring the lines between what is old and what is new, Graves' building is once again confronting history on its own terms. Only this time that history is its own.

The vision:
Classic architectural style with modern efficiency.

Photo courtesy of Kenneth M. Wyner Photography, Inc.

"Every aspect of the window was well-conceived and Kolbe was able to provide meaningful solutions for several shaped units that were large, difficult to engineer and install."

University of Virginia | Charlottesville, VA

Entering its third century in 2020, University of Virginia positions its campus for continued growth and success as it continues the vision of its founder, Thomas Jefferson. Contributing to UVA's enduring vision and the architectural tradition established by Jefferson, Kolbe's windows and doors are featured on several campus buildings. Only Kolbe could provide the custom sizes, craftsmanship, options, and performance for the renovated Rouss Hall and Monroe Hall, and the new LEED® Gold certified Bavaro Hall.

KOLBE®
WINDOWS & DOORS
We're for the visionaries.®

Find your vision at **KolbeWindows.com | 800.955.8177**

THE STUDIO

Renée Cheng, FAIA
Professor and associate dean of research,
University of Minnesota, School of Architecture | College of Design

Carlos Jiménez
Principal and lead designer, Carlos Jiménez Studio
Professor and interim dean, Rice University, School of Architecture

V. Mitch McEwen
Principal, McEwen Studio
Co-founder, A(n) Office
Assistant professor, Princeton University, School of Architecture

PRIZE

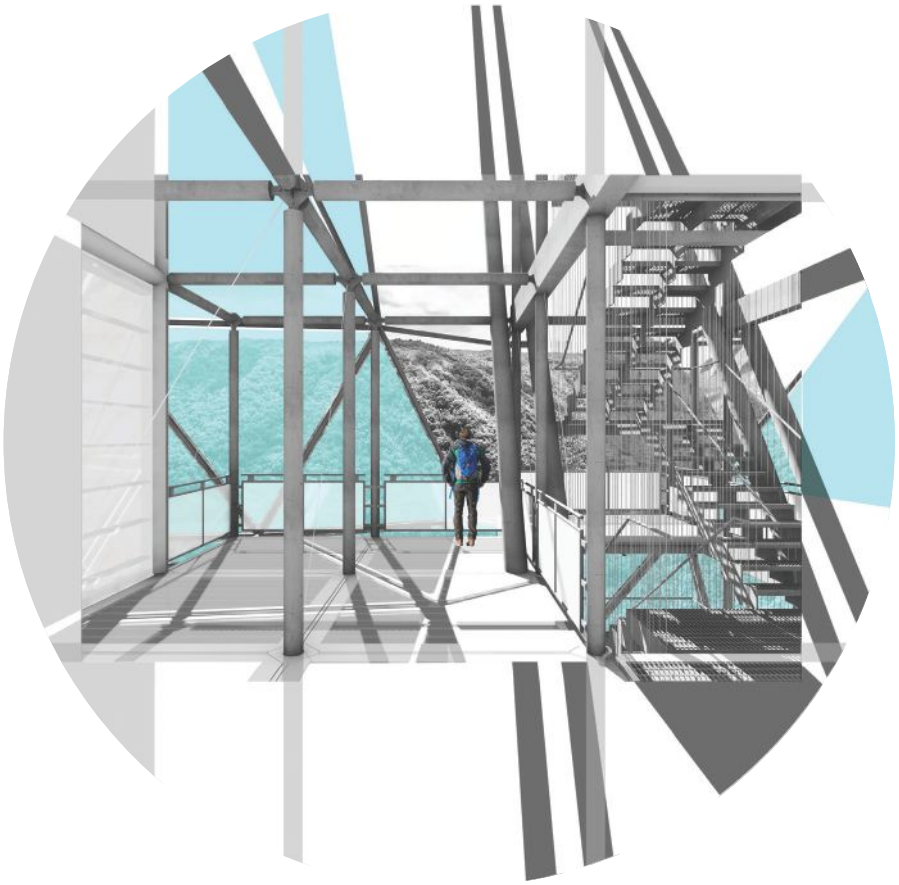
If the studio course is the bedrock of architectural education, then it follows that as the studio goes, so, eventually, goes the profession. By highlighting the most innovative courses in architectural schools across North America, the Studio Prize offers a glimpse into the concepts shaping today's design students, and into the ways they might influence the built environment in the future.

This year's jury of distinguished practitioners and educators—Renée Cheng, FAIA, Carlos Jiménez, and V. Mitch McEwen—was driven to analyze both the student work on display and the curricular framework of the studios themselves. "In the past, it was sufficient for the studio premise to be bound by the traditional silos of the profession," Cheng says. "Today's studios are embracing influences well outside of traditional architectural concerns, and use analytical techniques that may be data-driven or scaleless. When these explorations are catapulted into form and space, the results can be spine-tinglingly exciting."

The studios that garnered this year's awards—the Studio Prize for general excellence and the Sloan Award for investigations into sustainability and water conservation—embody this idea. They look to outside influences for inspiration and use collaboration to leverage the impact of design on social, sustainable, or tectonic terms. If this breadth of approach gets baked into the DNA of the next generation, their contributions to architecture will be transformative.

Studio Prize
Mining Appalachia

University of Virginia
School of Architecture



Studio Brief:
This studio asked third-year master's students to propose a small-scale interpretive or welcome center at a National Park Service site. Situated at an abandoned coal mine in West Virginia, the property is rich with historic industrial structures, and the students were encouraged to use these as precedents to inspire their own detail-focused designs.

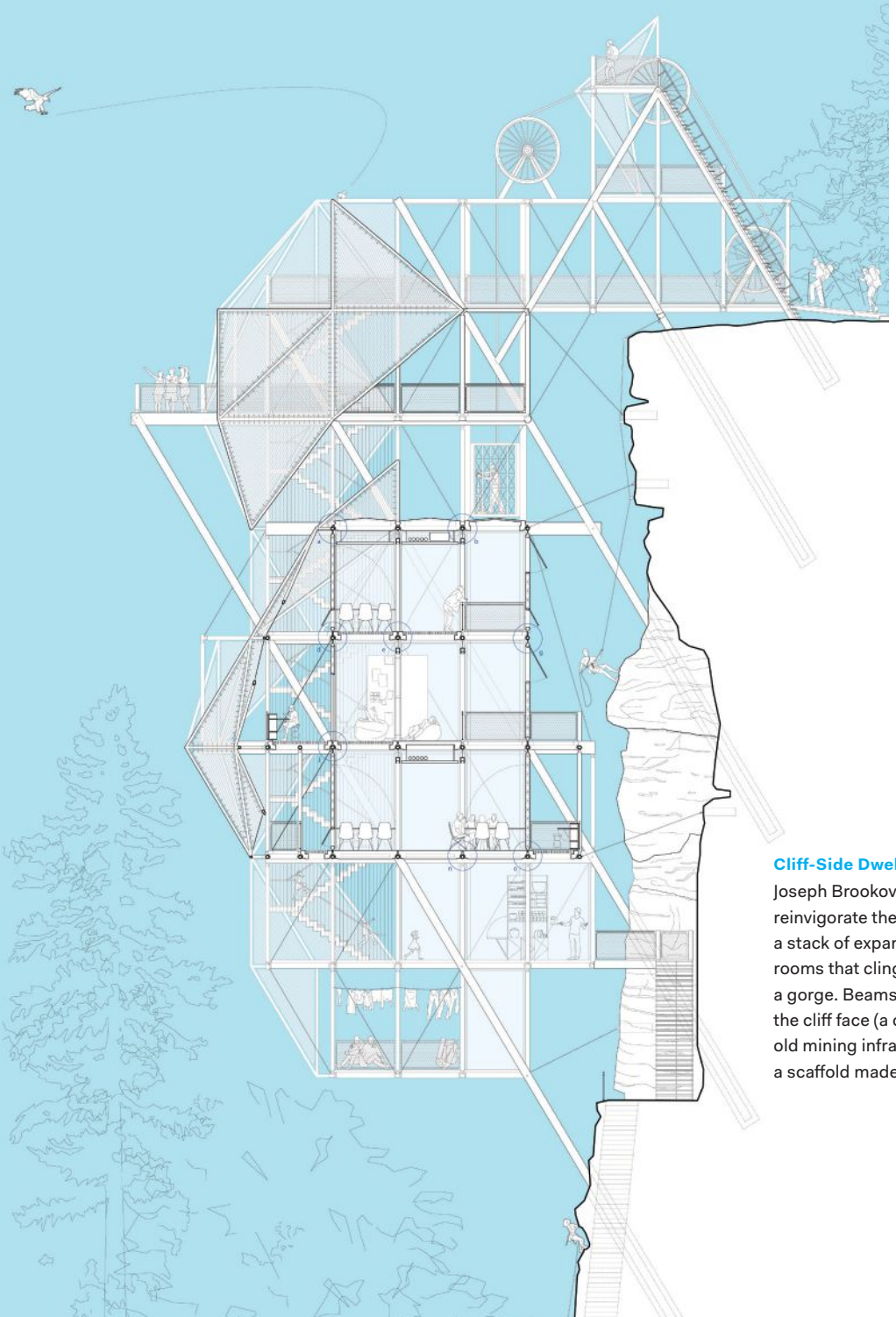
Investigation:

Dating back to the late 1800s, the riverside mining complex in Nuttallburg, W.Va., is an industrial ghost town. Out of commission since the 1950s, the rusting collection of buildings and infrastructure provided inspiration for a studio imagining new life for the site. The studio—co-taught by professor Edward Ford, AIA, and assistant professor Luis Pancorbo—focused on the context as a library of architectural details.

Students spent a day touring the mine; it's now under the jurisdiction of the National Park Service, which is considering adding a visitor center. One of the most complete coal-related historic sites in the U.S., the complex contains mine entrances, ore-conveyance infrastructure, and an extensive railroad network. The instructors encouraged the students to think broadly about a potential visitor experience. "People react to beautiful sites in different ways," Ford says. "Some want to make as minimal a disturbance as possible, others blow a hole in the mountain."

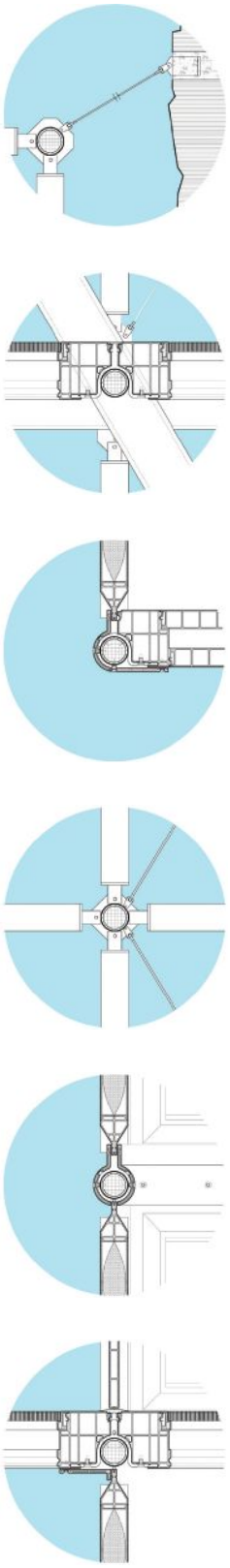
Students began sketching and modeling by hand—first small interventions based on what they saw on their visit, then tectonic systems, then bigger models to test their ideas for new structures to augment the site. The remaining rails, steel beams, and trusses had a strong influence on the student projects—some were even incorporated as design elements in the proposed structures—and tapping into such a robust architectural language grabbed the jury's attention. "Graphically it's quite rich," said juror Carlos Jiménez, "and there are moments that are so compelling."

Studio Credits
Course: Mining Appalachia
School: University of Virginia, School of Architecture
Level: M.Arch., without preprofessional degree (year three)
Duration: Spring 2017 semester
Instructor: Edward Ford, AIA (professor of architecture); Luis Pancorbo (assistant professor)
Students: Joseph Brookover, Nicholas Darin, Andrew Shea (submitted projects); Adjoa Akowuah, Carey Alcott, Joshua Kahn Aronson, Meredith Blake, Philip Chang, Di Chen, Blue Vincent Clements, Tamara Dennis, Benjamin Glor, Lizhe Han, Laurence Holland, Jennifer Hsiaw, Chad Miller, Shannon Ruhl, Matt Scarnaty, Sam Harrison Sidersky, Sean Sullivan, Hao Wang, Dillon Wilson, Tensae Woldesellasie, Fuhou Zhang

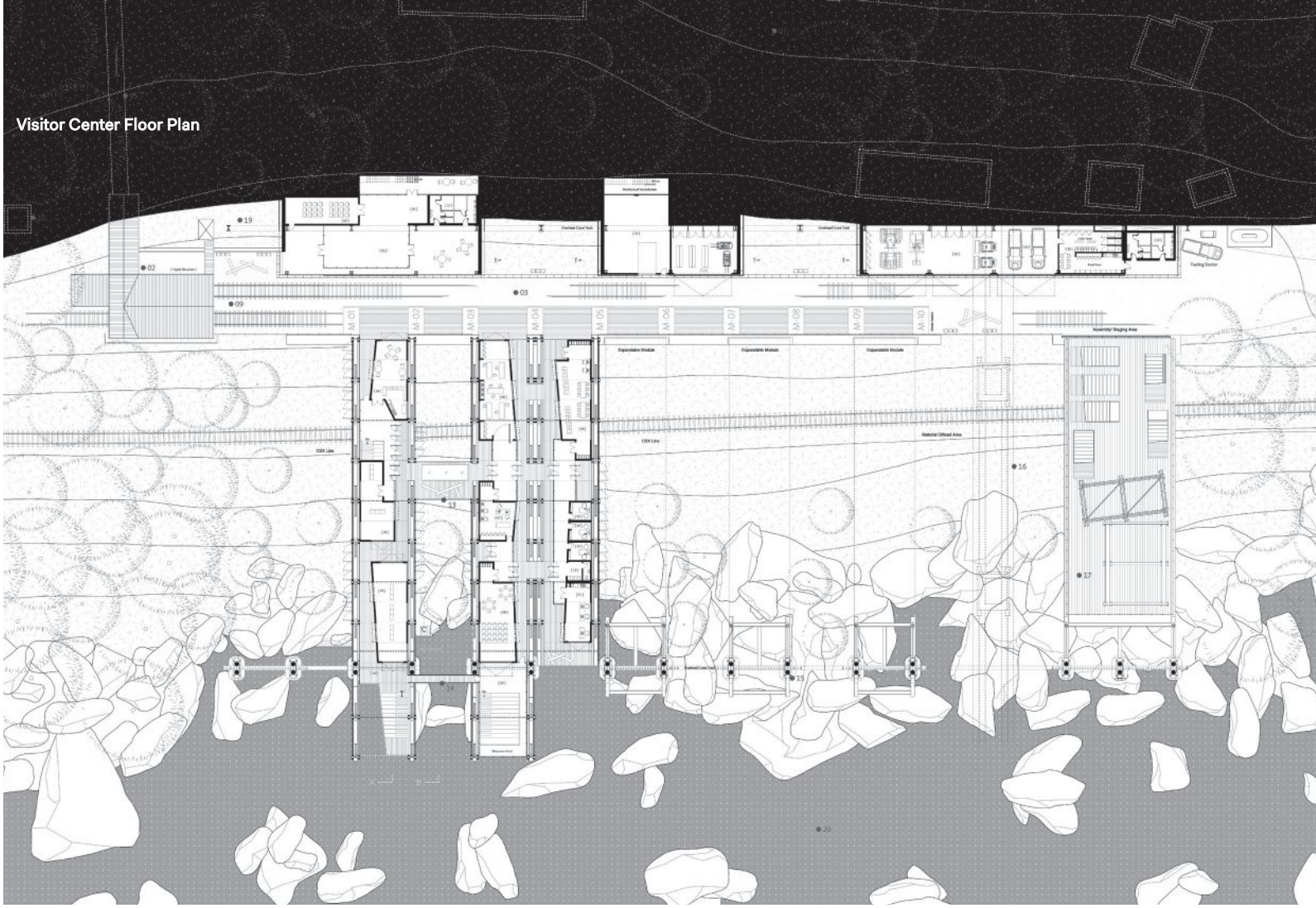


Cliff-Side Dwelling
Joseph Brookover's proposal to reinvigorate the historic site includes a stack of expandable, multipurpose rooms that cling to the upper ridge of a gorge. Beams anchor diagonally into the cliff face (a common practice in the old mining infrastructure) and support a scaffold made of prefabricated parts.

Connection Details



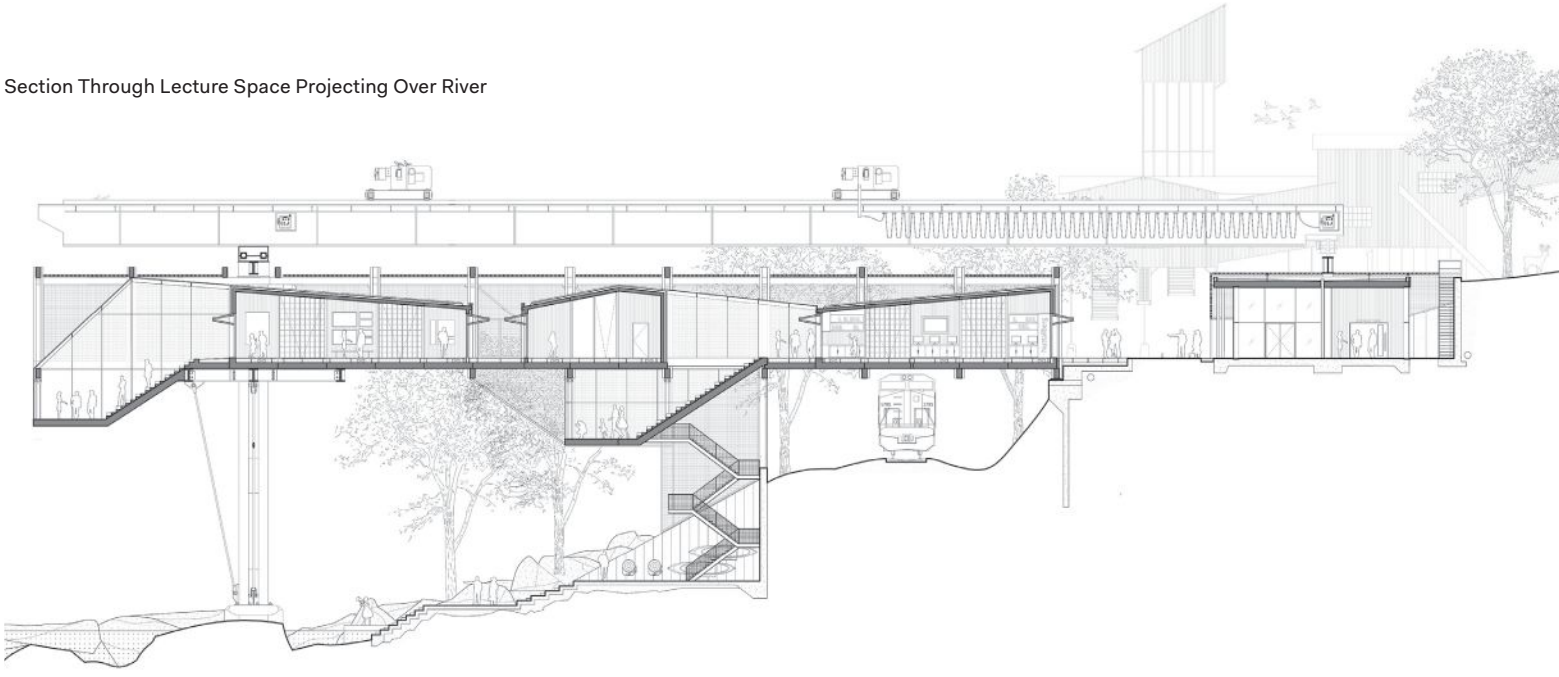
Visitor Center Floor Plan



Post-Industrial Appalachia

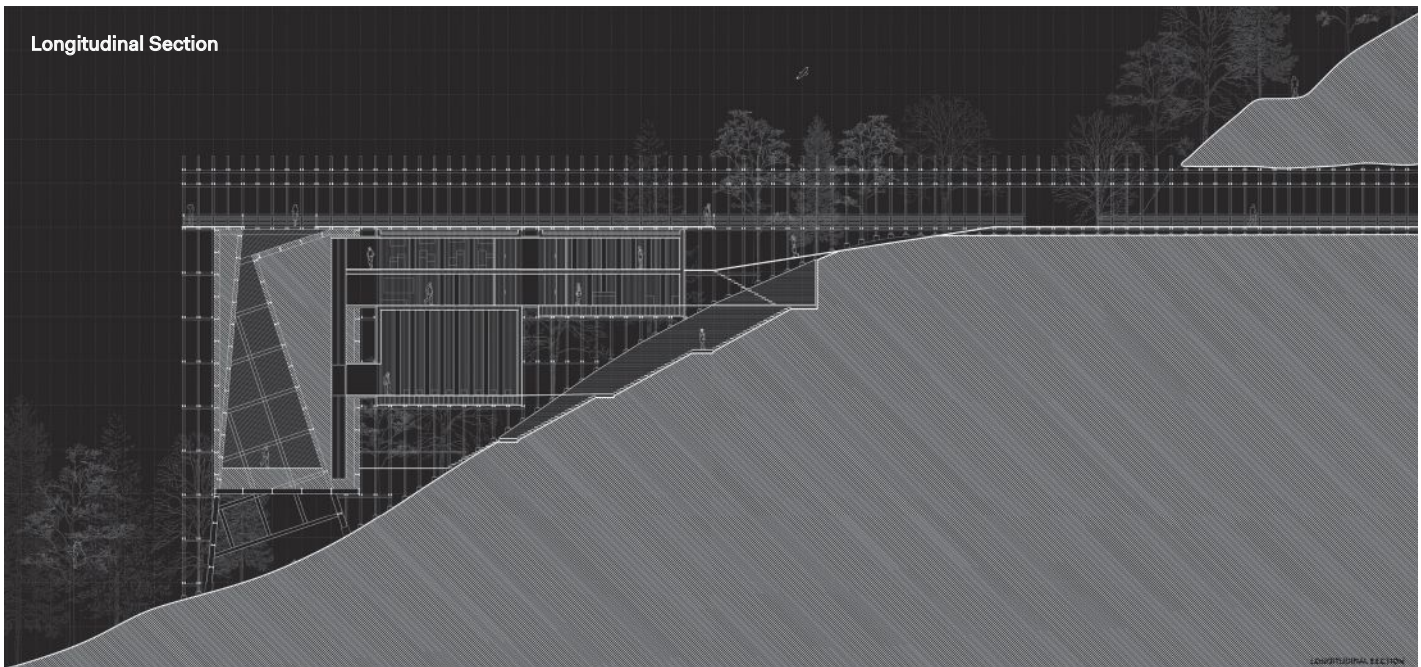
Andrew Shea's proposal for a 10,000-square-foot visitor center builds directly onto an existing overhead structure that served to load coal onto freight trains. Exhibit and lecture areas are embedded between the existing steel support towers and cantilever over the river below. A barlike volume embedded into the hill connects these spaces and holds mechanical and storage areas.

Section Through Lecture Space Projecting Over River

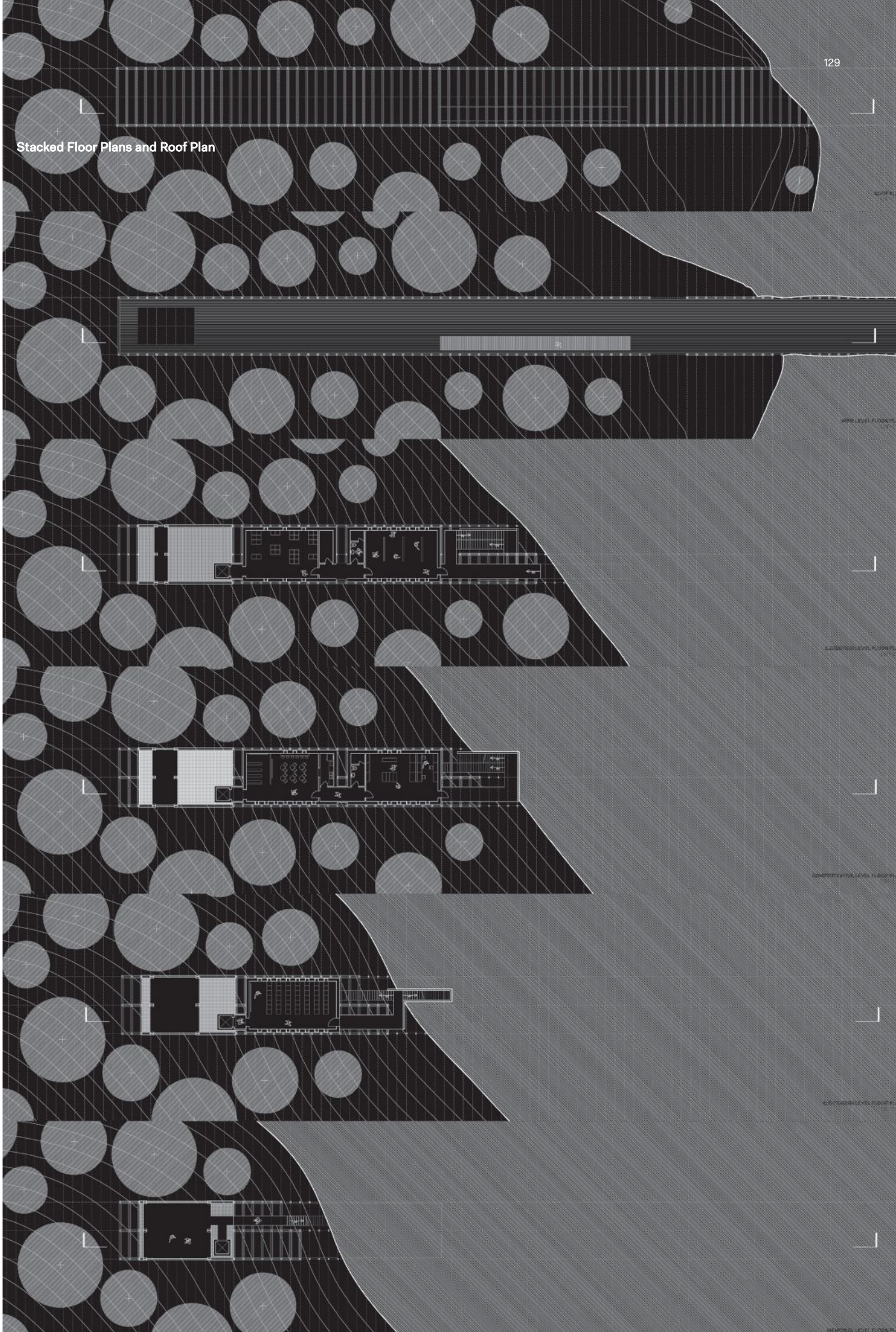


Memorial to the Fallen Miners

Nicholas Darin's proposal for a memorial to miners killed in mining accidents throughout Appalachia features three suspended volumes that step down a hill, following the steep drop-off of the site's topography. The visitor experience, which is intended to recall that of miners moving through the tunnels, culminates in the memorial proper: a 72-foot-tall steel cage filled with slate that references the collapses and slides that killed many miners in the region.



Stacked Floor Plans and Roof Plan



Studio Prize

Vagabond, Nomadic House (Imagination + Construction + Experience)

Université Laval
Faculty of Planning, Architecture, Arts and Design

Studio Brief:

This first-year master's studio proposed new housing strategies and designs for rapidly growing populations in two Inuit villages in northern Québec. Moving away from the top-down housing interventions of the past, the studio engaged students with addressing local needs and interests in the design process.

Investigation:

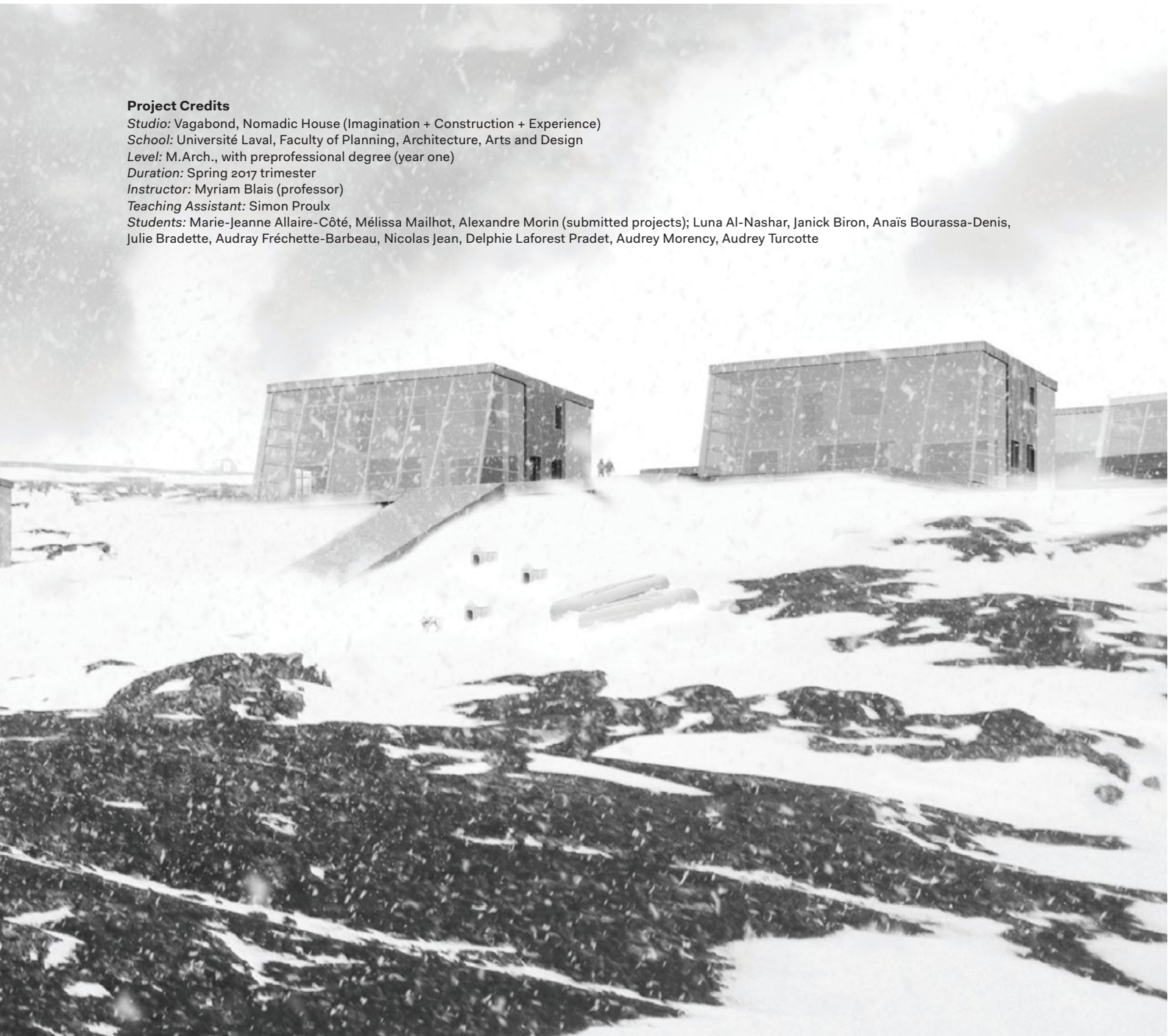
The formerly nomadic Inuit of Nunavik, a region in northern Québec, have recently transitioned to a stationary lifestyle, mostly through government-subsidized housing. But they had little say in how their homes were designed and their culture shaped. With Canadian government funding and in partnership with other universities, Université Laval is pursuing a multifront effort to reimagine the communities' design and self-determination.

A Université Laval architecture studio, led by professor Myriam Blais, looked at how housing can better meet the communities' needs at a variety of scales—from territorial conditions to construction details that would withstand Arctic conditions. Students took a long-term view of how the Inuit can guide village planning and housing. "These villages have to think about the future," Blais says. "People should feel that they can be more involved."

The studio took a weeklong trip to visit the villages, study the pre-existing housing, and meet with local leaders to learn about their changing lifestyle.

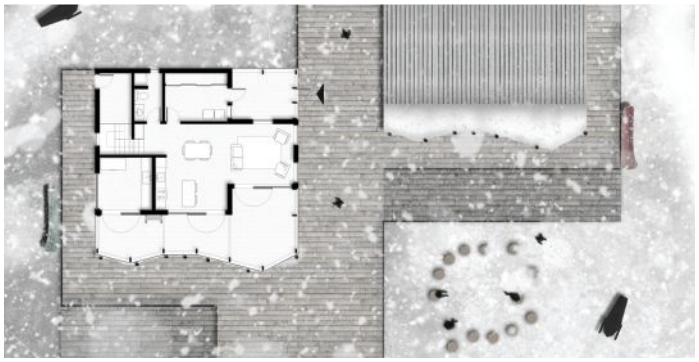
The jury was impressed by the range of approaches and the overall sensitivity to the community's needs. "It's talking about the site in a way that is aware of anthropology, but really fresh," juror V. Mitch McEwen said. "And the architecture resonates with that."

Project Credits
Studio: Vagabond, Nomadic House (Imagination + Construction + Experience)
School: Université Laval, Faculty of Planning, Architecture, Arts and Design
Level: M.Arch., with preprofessional degree (year one)
Duration: Spring 2017 trimester
Instructor: Myriam Blais (professor)
Teaching Assistant: Simon Proulx
Students: Marie-Jeanne Allaire-Côté, Mélissa Mailhot, Alexandre Morin (submitted projects); Luna Al-Nashar, Janick Biron, Anaïs Bourassa-Denis, Julie Bradette, Audray Fréchette-Barbeau, Nicolas Jean, Delphie Laforest Pradet, Audrey Morency, Audrey Turcotte



First-Floor Plan—Summer

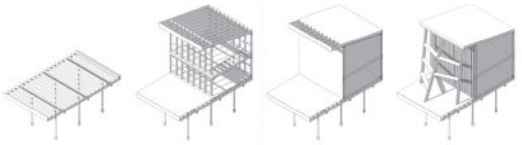
First-Floor Plan—Winter

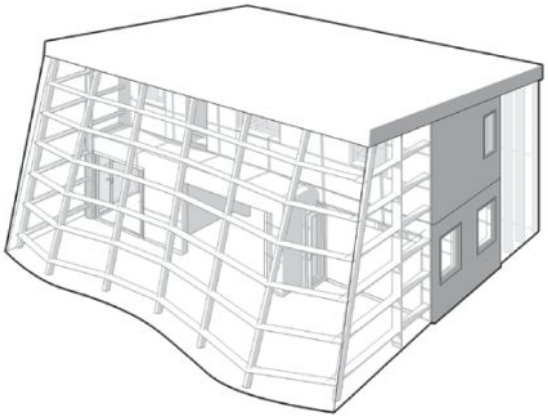


The North, As Perceived

Mélissa Mailhot's proposal for a new type of dwelling features a large enclosed porch that is inspired by the construction of Inuit kayaks. The house rises on piers to minimize impact on the landscape and is constructed of recycled and recyclable materials. The porch can be opened to the rest of the house in warmer months, increasing living area, and it provides a sheltered connection to the landscape and an insulating buffer for the living spaces during the harsh winter (bottom left).

Construction System Diagrams

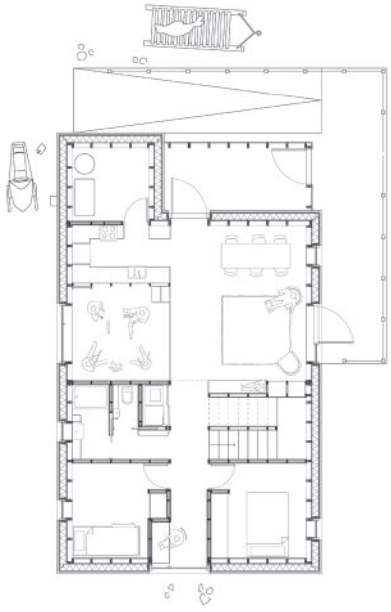




Qatigiipuut—Let's Do It Together

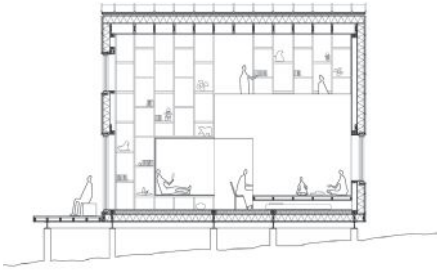
Marie-Jeanne Allaire-Côté focused less on a single dwelling and more on how architecture can help to create a sense of permanence for a people who have long been nomadic. She grouped dwellings into family clusters and prioritized gathering space within them (above) to allow the community's tradition of collaboration to take precedence in these new static villages.

First-Floor Plan

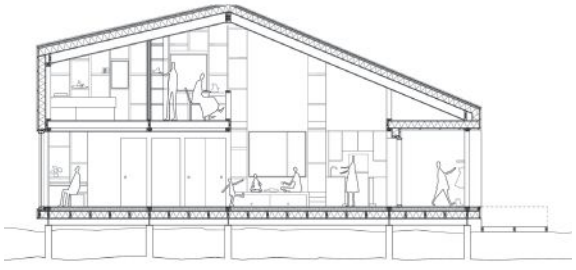


Second-Floor Plan

Cross-Section



Longitudinal-Section



Nordic Home

Alexandre Morin designed a housing prototype and carved its living room into a diverse series of spaces, so that a large family of eight or nine people can cohabitate while pursuing different activities (opposite). The scheme prioritizes views from the group areas to a nearby river and other landscape features, allowing the residents to maintain their connection to nature even while staying indoors together through the winter months (top).

Studio Prize
Real Fictions Cairo

University of Pennsylvania
School of Design

Studio Brief:

To address Cairo's severe traffic gridlock and lack of quality public space, this third-year master's studio developed tactical designs that could transform the city's existing transportation infrastructure into urban amenities. Focusing specifically on areas where bridges meet the edge of downtown, the students were tasked with proposing subtle but meaningful interventions to the built environment.

Investigation:

Cairo has no shortage of urban challenges. "It's a city that is completely suffocating because of traffic problems, bad infrastructure planning, no public spaces, no parks," says Ferda Kolatan, an associate professor at the University of Pennsylvania, School of Design. "The pedestrians are a complete afterthought." That's part of the reason Kolatan was asked by the Egyptian Ministry of Culture in Cairo to develop a studio that could come up with solutions.

After talking with local residents, politicians, and planners, the studio decided to focus on three sites where a bridge over the Nile touches down in the city. On a trip to the Egyptian capital, students visited these areas and took photos and videos that they used to create almost-hyperrealistic renderings of the current conditions. These visuals are the basis for their projects—each of which rethinks use and usability.

The goal was to hybridize existing infrastructure with new architectural elements. Uniquely, the studio called on students to present these ideas as decontextualized "objects." "Rather than suggest specific solutions, we wanted to present prototypes that can be implemented at different scales," Kolatan says.

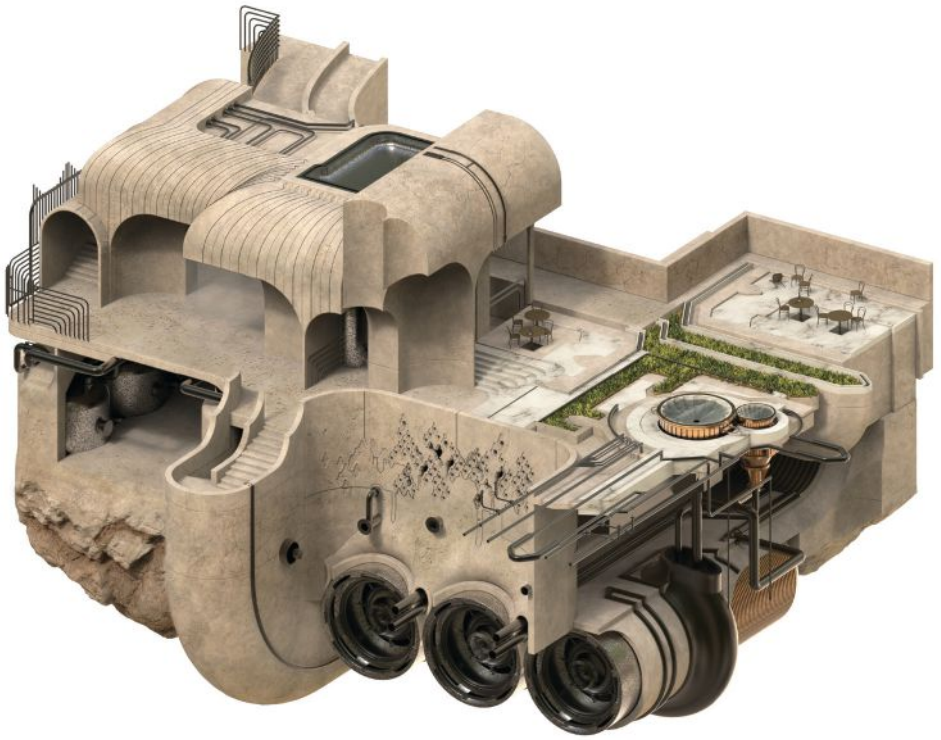
The jury cited this approach in awarding the prize: "It's not just formal exploration, it's tied to a brief that addresses economy and how different aspects of the city relate to each other," said juror V. Mitch McEwen.

Studio Credits

Course: Real Fictions Cairo (Design Research Studio)
School: University of Pennsylvania, School of Design
Level: M.Arch., without preprofessional degree (year three) and Master of Science in Design, Advanced Architectural Design, postprofessional degree
Duration: Spring 2017 semester
Instructor: Ferda Kolatan (associate professor of practice, coordinator of design research studies)
Teaching Assistant: Michael Zimmerman
Students: Alexander Tahinos, Angela Huang, Meari Kim, Kyuhun Kim, Angeliki Mavroleon, Rosanne Pitarresi (submitted projects); Aly Abouzeid, John Dade Darby, Carrie Rose Frattali, Angeliki Tzifa, Kaikang Shen, Jianbo Zhong
Special Thanks: Eng. Ibrahim Mehlib, Dr. Laila Iskandar, Eng. Mohamed Abu Saeda, Dr. Gihane Zaki, Dr. Haby Hosney, Aly Abouzeid, Ahmed Zaazaa

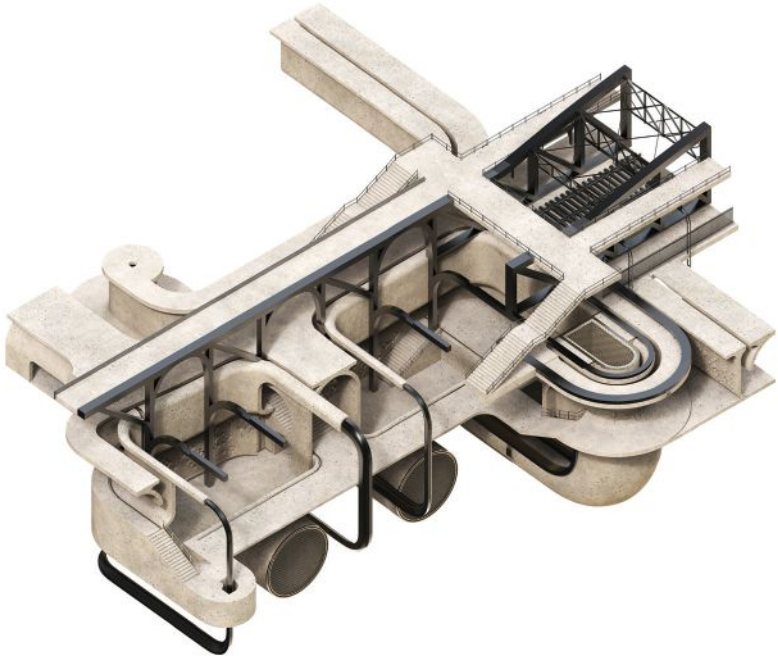
Pier Gardens

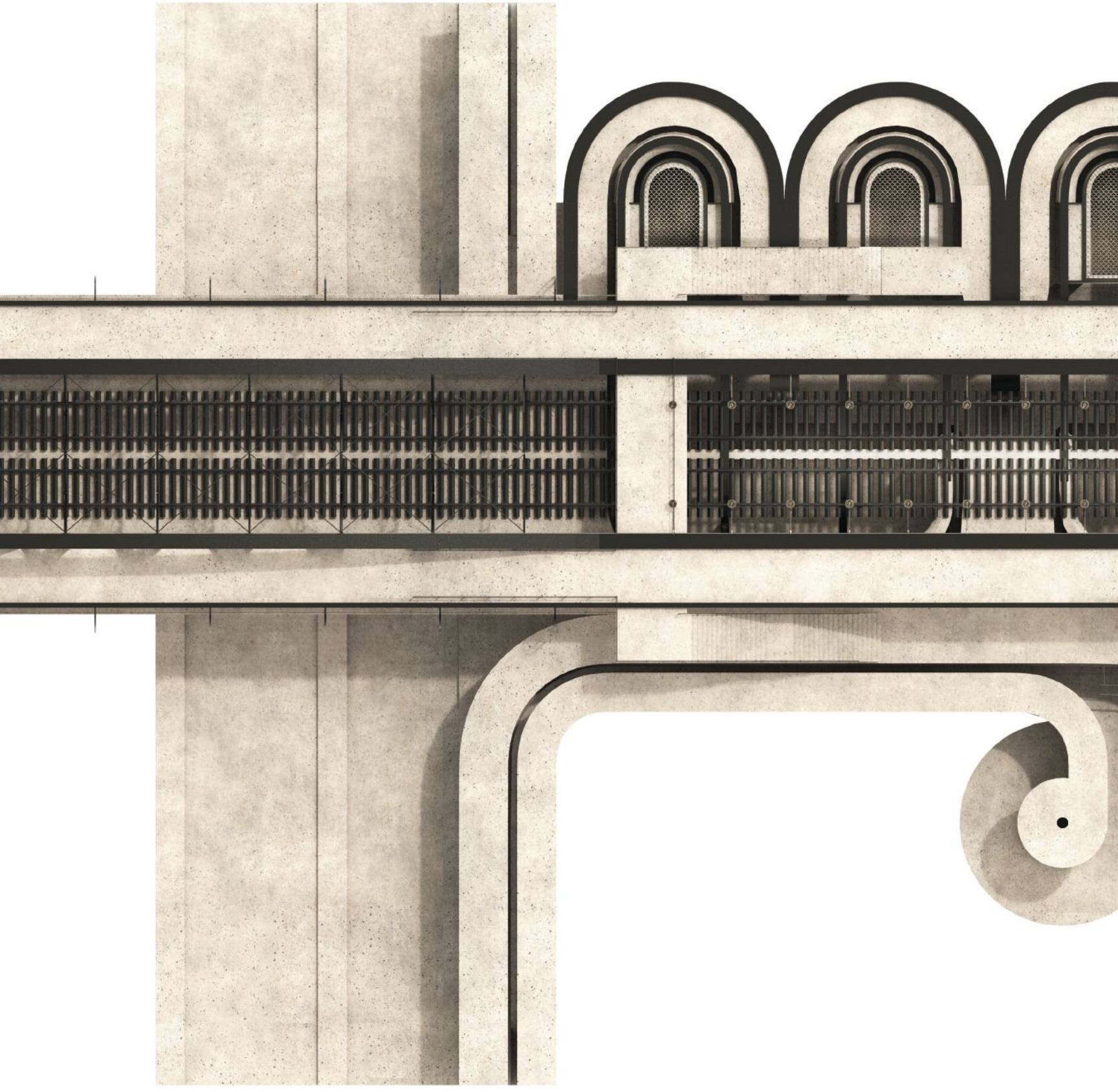
Alexander Tahinos and Angela Huang reimagined the western landing of the Qasr Al Nil Bridge, adding stairs and ramps to open up the existing waterfront promenade, which would be supplemented by cafés and retail (previous page). Decommissioned piers are recast as offices (below), topped by wild gardens irrigated by turbines in the river (right). Sited near a classical garden that limits public entry, this garden would be accessible to all residents.

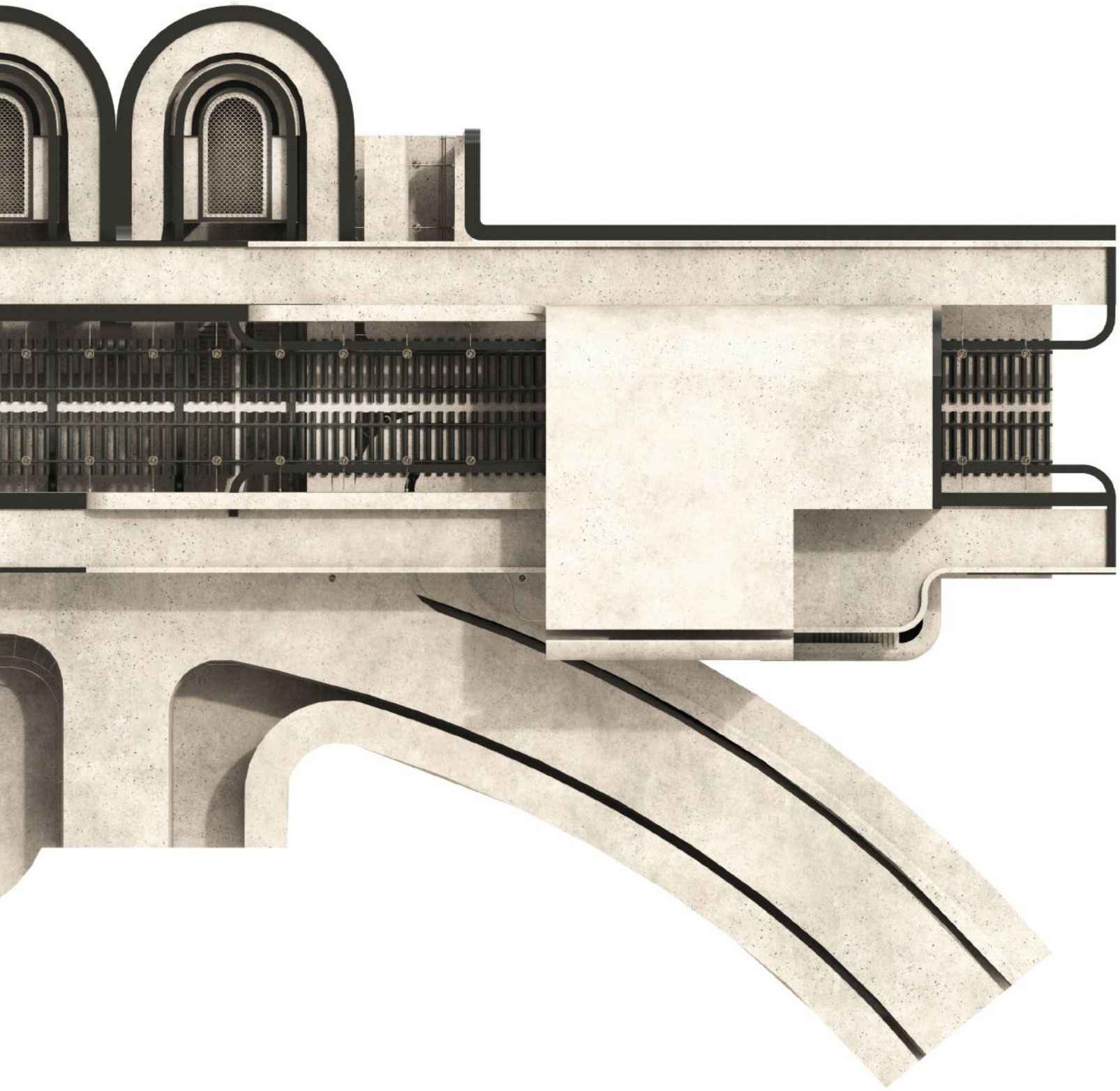


Railway Bazaar

This proposal from Angeliki Mavroleon and Rosanne Pitarresi carves out space beneath the Imbaba Bridge that serves as a bazaar, both to add a second use to the railway structure (next page) and to provide safe pedestrian access across it, which does not exist today. Skylights bring natural light into a subterranean space, which sits at the point where the bridge meets the bank of the Nile (above).







Over-Under Bridge

Meari Kim and Kyuhun Kim's proposal reconfigures the landing of the 6th of October Bridge, a main vehicular artery into downtown Cairo. Their solar-paneled bus canopy provides shade and helps reorganize chaotic bus lanes; it sits at the base of a new office tower that connects the different levels of traffic and infrastructure, providing safer connections for pedestrians than the current conditions. An empty space under the bridge is converted into a new performance space (above) that makes what is now a chaotic intersection into a cultural destination.

Studio Prize
Natural Tendencies

Woodbury University
School of Architecture

Studio Brief:

This second-semester studio for first-year B.Arch. students is a tightly controlled introduction to a wide range of architectural concepts, tools, and skills. By keeping the programmatic focus narrow, students were able to investigate the tectonics of architecture—learning about materials, fabrication, site, and synthesis in one comprehensive course of study.

Investigation:

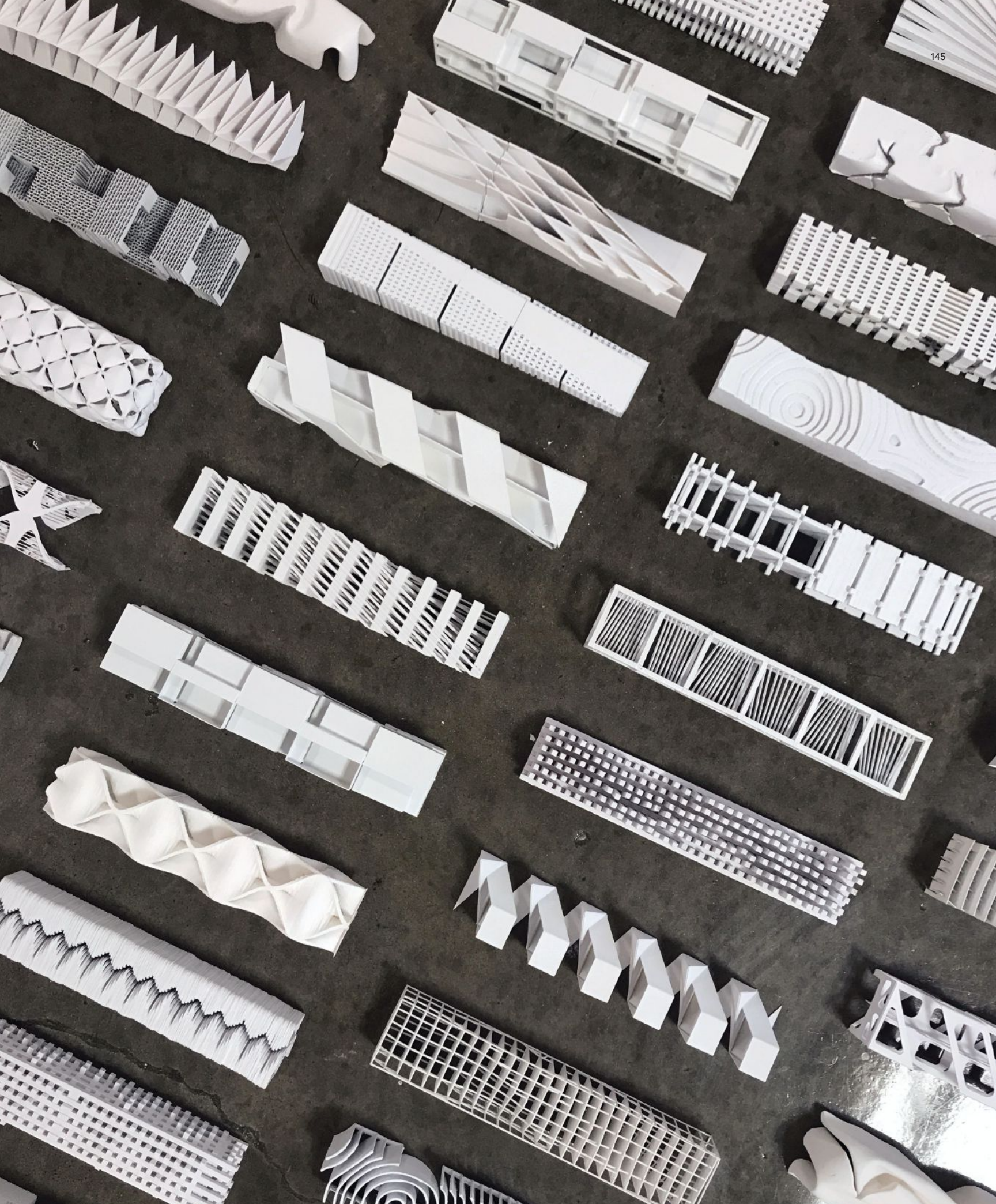
The first year at Woodbury is a skill-building year—one that lays the foundation for competent growth. "We're preparing students to study architecture from a position of empowerment," says associate professor Heather Flood, who co-taught the studio with Yi-Hsiu Yeh and Nate Imai. "They're well-tooled, conceptually and technically, to engage difficult problems later on."

This studio uses the tectonics of structure and architecture to guide the students toward that place of empowerment. The students design a 10,000-square-foot rectangular library, but the focus is less on the end product than the process, which Flood breaks into four phases. First, a material exploration, in which students build three bar-shaped models of the library by hand. Second is fabrication, where the students create models using Grasshopper and digital fabrication. Third, the students incorporate GIS data to produce site plans. Finally, the students create five models based on their newfound understanding and control over tectonics.

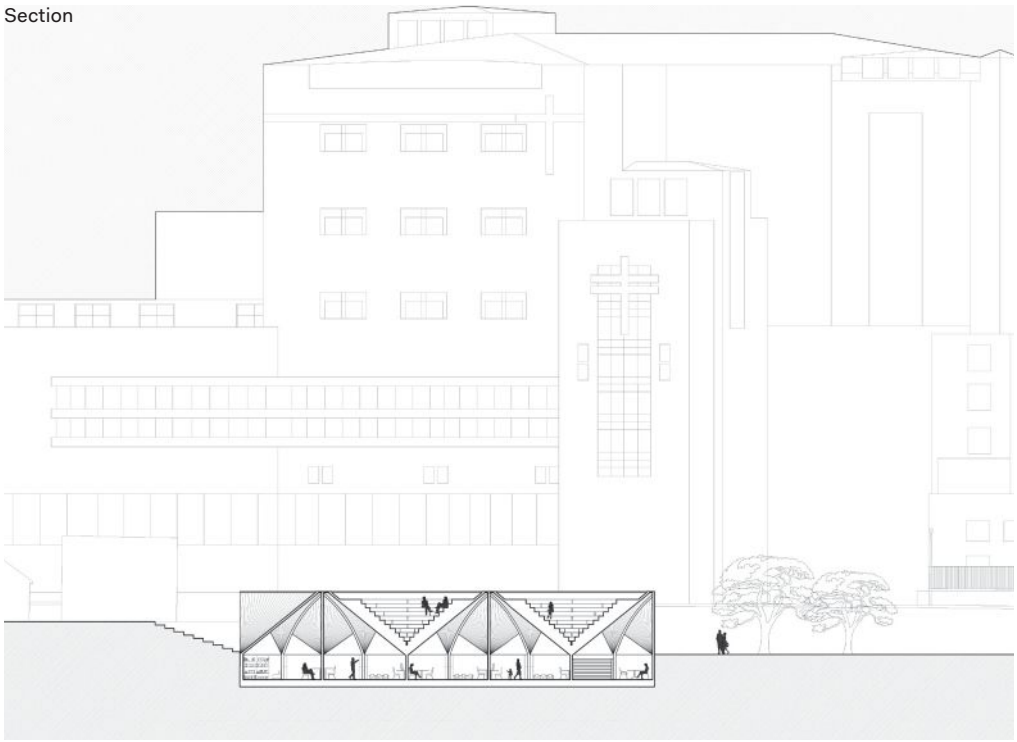
"Looking at the way something is made both materially and in terms of construction logics is enough to generate a rich architectural idea," she says.

The simplicity of this approach impressed the jury. "It was nicely crafted," said juror Renée Cheng. "You could really see what the students were learning in the series of things they produced."

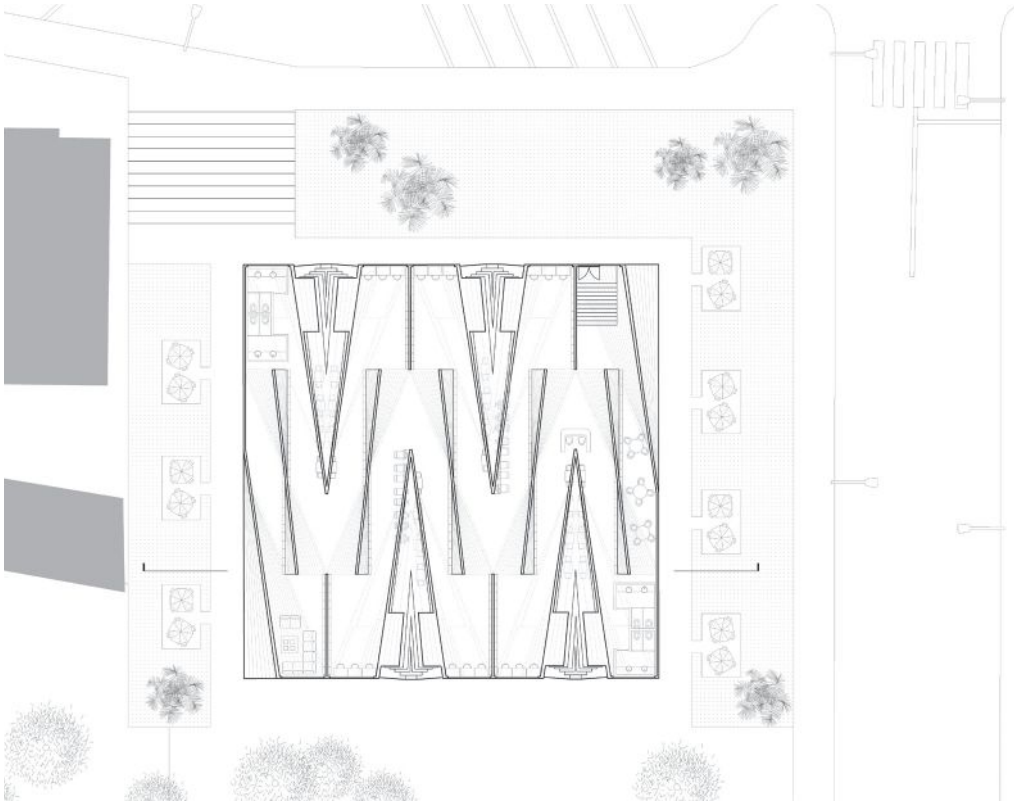
Project Credits
Course: Natural Tendencies
School: Woodbury University, School of Architecture
Level: B.Arch. (year one)
Duration: Spring 2017 semester
Instructors: Heather Flood (associate professor, visiting faculty); Yi-Hsiu Yeh, Nate Imai (adjunct faculty)
Students: Anahit Antanyan, Louiza Chilian, Ulysses Hermosillo (submitted projects); Adrian Rios, Adriel Navarro, Angel Escobar, Anthony Johnson, Arda Kilickan, Christopher Madrid, Cindy Chilin, Douglas Lopez, Erik Ortiz, Hosam Fatani, Jackely Tejada, Jesse Perez, Juan Devis, Karla Sandoval, Kevin Lugo-Negrete, Kimberly Perez, Lamont Burnley, Madeline Ramirez, Marta Huo, Max M. Perez, Melissa Uyuni, Michael Sanchez, Micol Romano, Patrick Castro, Peter Patpatian, Ricardo Jimenez Mosqueda, Rita Midourian, Rodney Yasmeh, Ryana Rangel, Saul Santizo, Sharece Shabazian, Ulysses Hernandez



Section



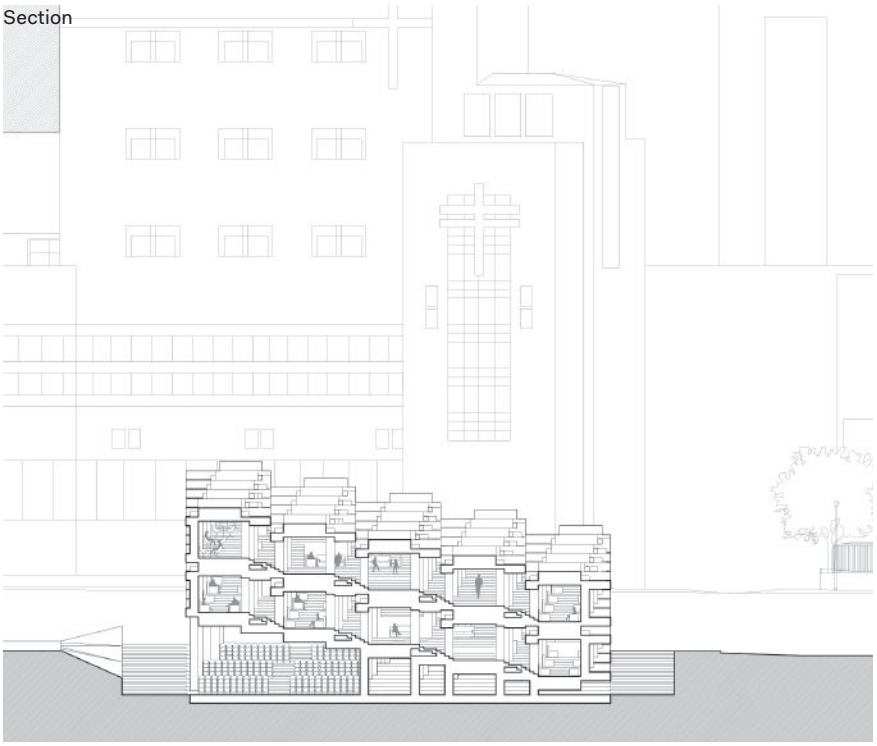
First-Floor Plan



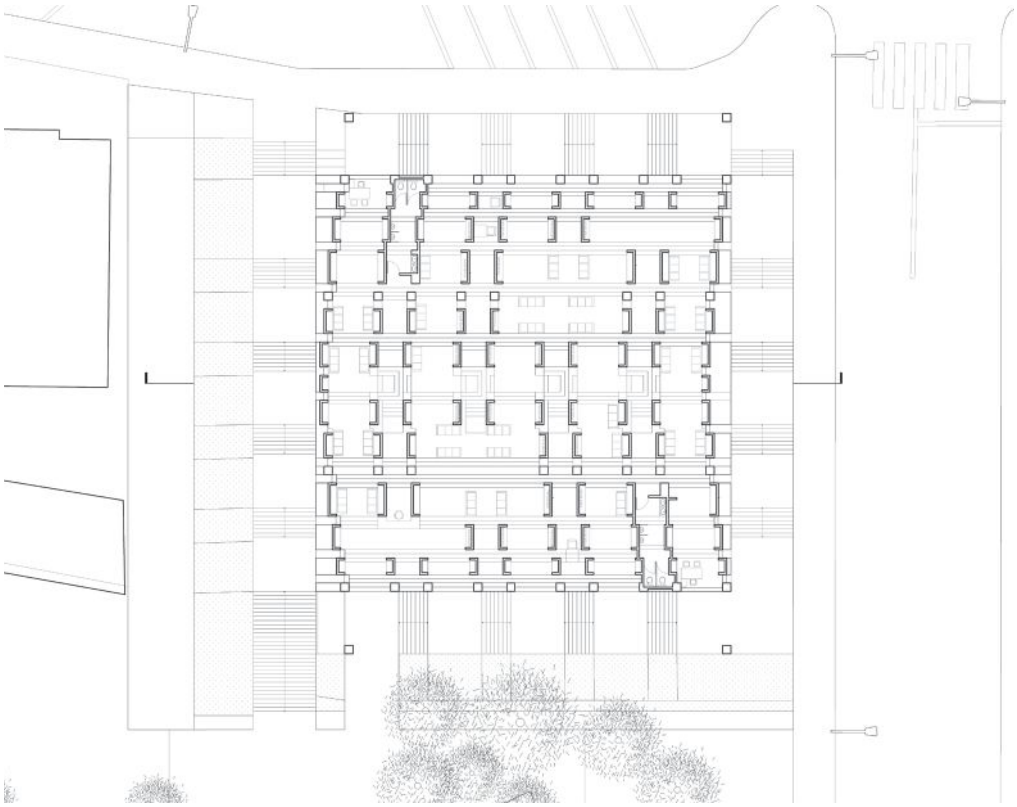
Natural Tendencies 1

Anahit Antanyan's plan and section for the 10,000-square-foot community library—sited (as are all the student projects) on Mariachi Plaza in the Boyle Heights neighborhood of Los Angeles—features a series of switchback aisles under a vaulted ceiling. The sloping roof creates occupiable outdoor spaces programmed with seating.

Section



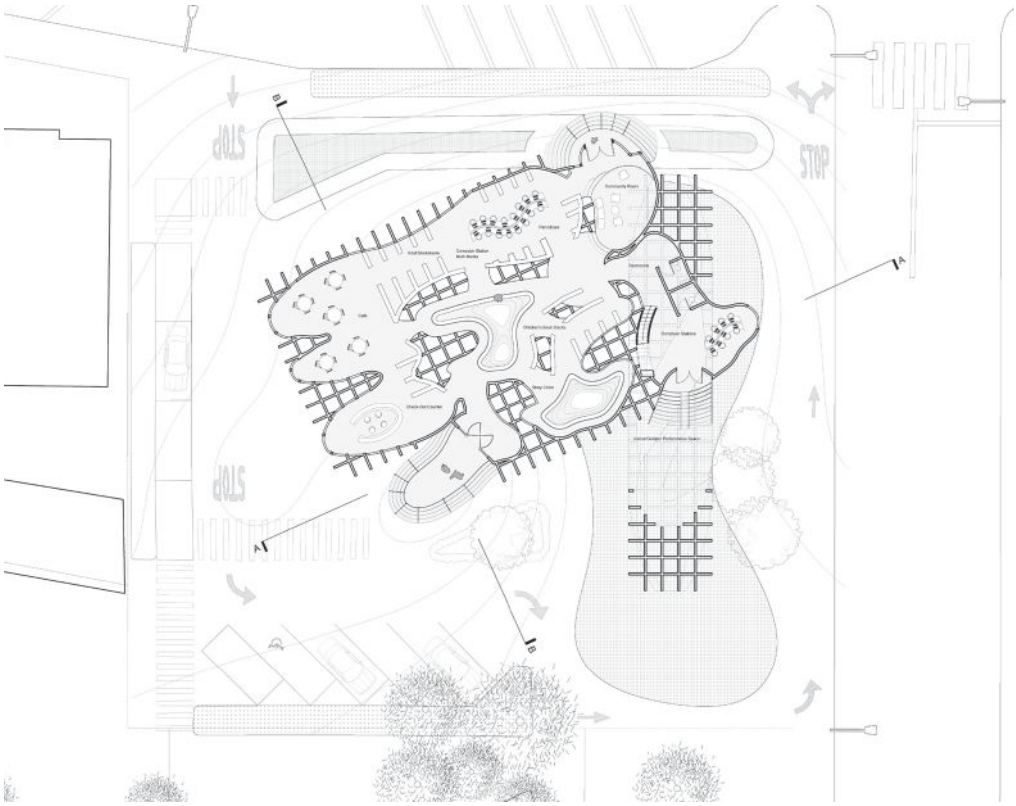
First-Floor Plan

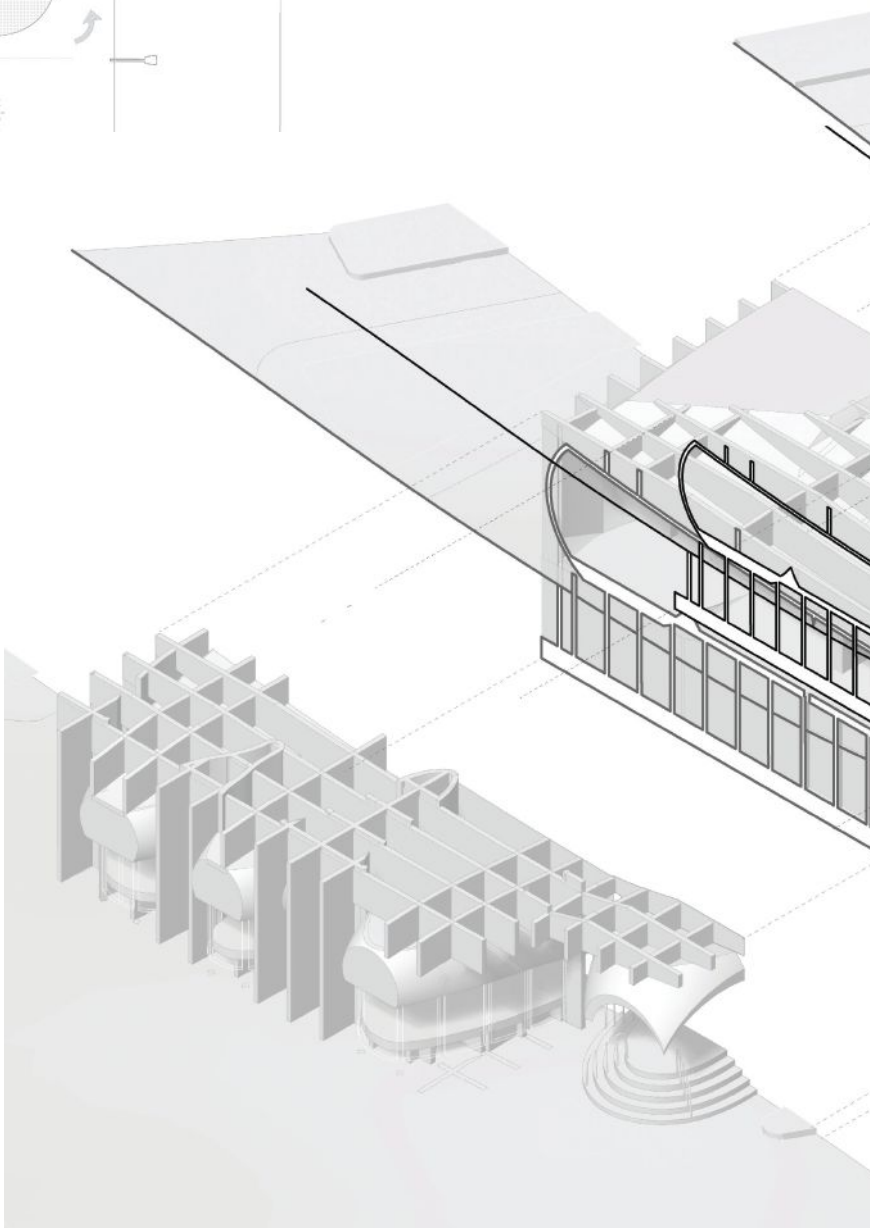


Natural Tendencies 2

Ulysses Hermosillo's library has several terraced levels that create an active experience as visitors move throughout the space and provide quiet nooks for reading and study, as well as community gathering.

First-Floor Plan

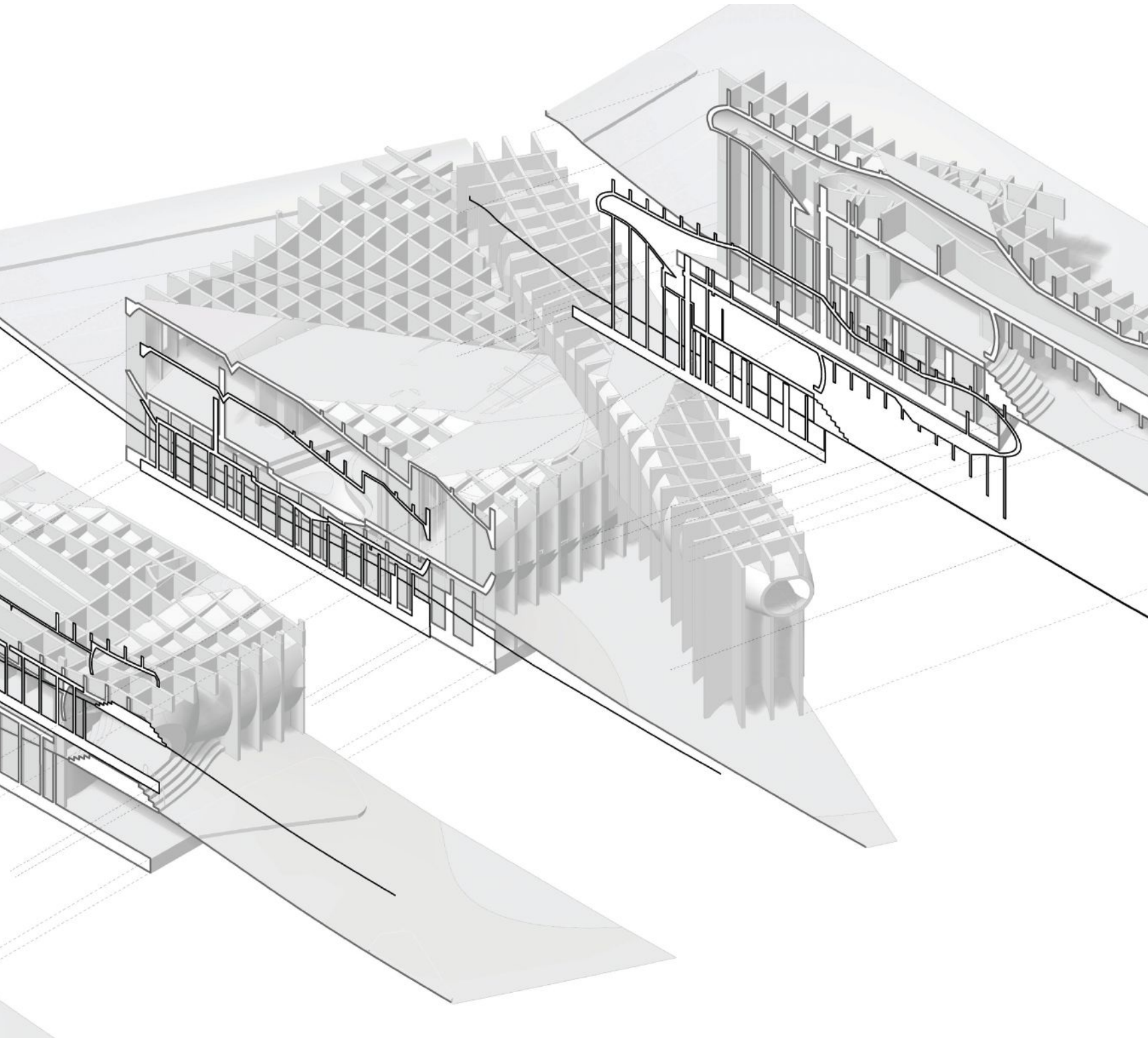




Natural Tendencies 3

Louiza Chilian's scheme focuses on public spaces in the ground floor, including a community room, computer station, and café, alongside a children's reading area. A protruding shade structure marks the entry from the public plaza.

Exploded Axonometric Section Diagram



Studio Prize
Urbanism After Extraction

Massachusetts Institute of Technology
School of Architecture + Planning

Studio Brief:

This urban design studio for first-year master's students studying architecture and urban planning focused on post-industrial transformation in the coal-producing region of southern Poland. Students were tasked with developing proposals for the region's post-coal future that emphasized environmental reclamation and social reconstruction. The intended outcome was not solely buildings or infrastructure projects, but also policy proposals that could guide the region's transition.

Investigation:

As southern Poland shifts away from coal mining, its landscape, population, and economy are undergoing a dramatic reconfiguration—one to which a typical urban design approach doesn't apply. To understand the region's unique conditions, the students did extensive in-studio mapping and spatial analysis of the area, and researched emerging development models as potential precedents for reorganizing policies and development patterns. They then embarked on a 10-day research trip, starting in Berlin, where they toured the nontraditional developments they'd studied, followed by a trip into southern Poland's coal country. Through a collaboration with a local university, the students were given a firsthand look at the region's communities, touring industrial sites and seeing the social implications of the area's economic transformation.

After returning to MIT, the students developed proposals centered around interventions that engage both the sites and residents. "More than creating a physical project, it was about shifting the perception of the industrial landscape, and preparing the social and environmental context for something new," says lecturer Marie Law Adams, AIA, who co-led the studio with associate professor Rafi Segal.

That approach grabbed the attention of the jury: Carlos Jiménez noted that he was "very impressed by the thoroughness of the intention of the studio."

Project Credits
Course: Urbanism After Extraction
School: Massachusetts Institute of Technology School of Architecture + Planning
Level: M.Arch., with preprofessional degree (year one); Master of Science in Architectural Studies, Master in City Planning
Duration: Spring 2017 semester
Instructors: Rafi Segal (associate professor of architecture and urbanism), Marie Law Adams, AIA (lecturer of urban design and planning)
Teaching Assistant: Garine Boghossian
Students: Monica Hutton, Ranu Singh, Daya Zhang, Diana Ang, Giovanni Bellotti, Kelly Leilani Main, Alexander Wiegering, Mario Giampieri, Nayeli Rodriguez (submitted projects); Nneka Sobers, Max Moinian, Akemi Sato, Justin Lim
Collaborators: Silesian University of Technology; Association of Polish Architects, Katowice; studio travel funded by MIT Leventhal Center for Advanced Urbanism and MIT Department of Urban Studies and Planning

PROCESS FOR ENGAGEMENT

GET STARTED

SILESIA IS MAKING PLANS FOR THE FUTURE AND YOU CAN TOO. GET STARTED WITH A FEW QUESTIONS:

WHO ARE YOU?

WHERE IS YOUR PROJECT?

WHAT DO YOU WANT TO DO?

FOR HOW LONG WILL YOUR PROJECT LAST?

- TEMPORARY
- PERMANENT

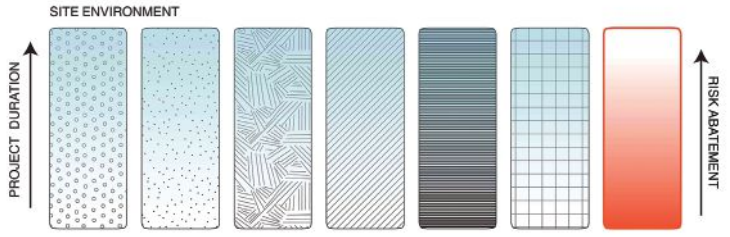
DO YOU HAVE A PLAN TO MANAGE ENVIRONMENTAL RISK?

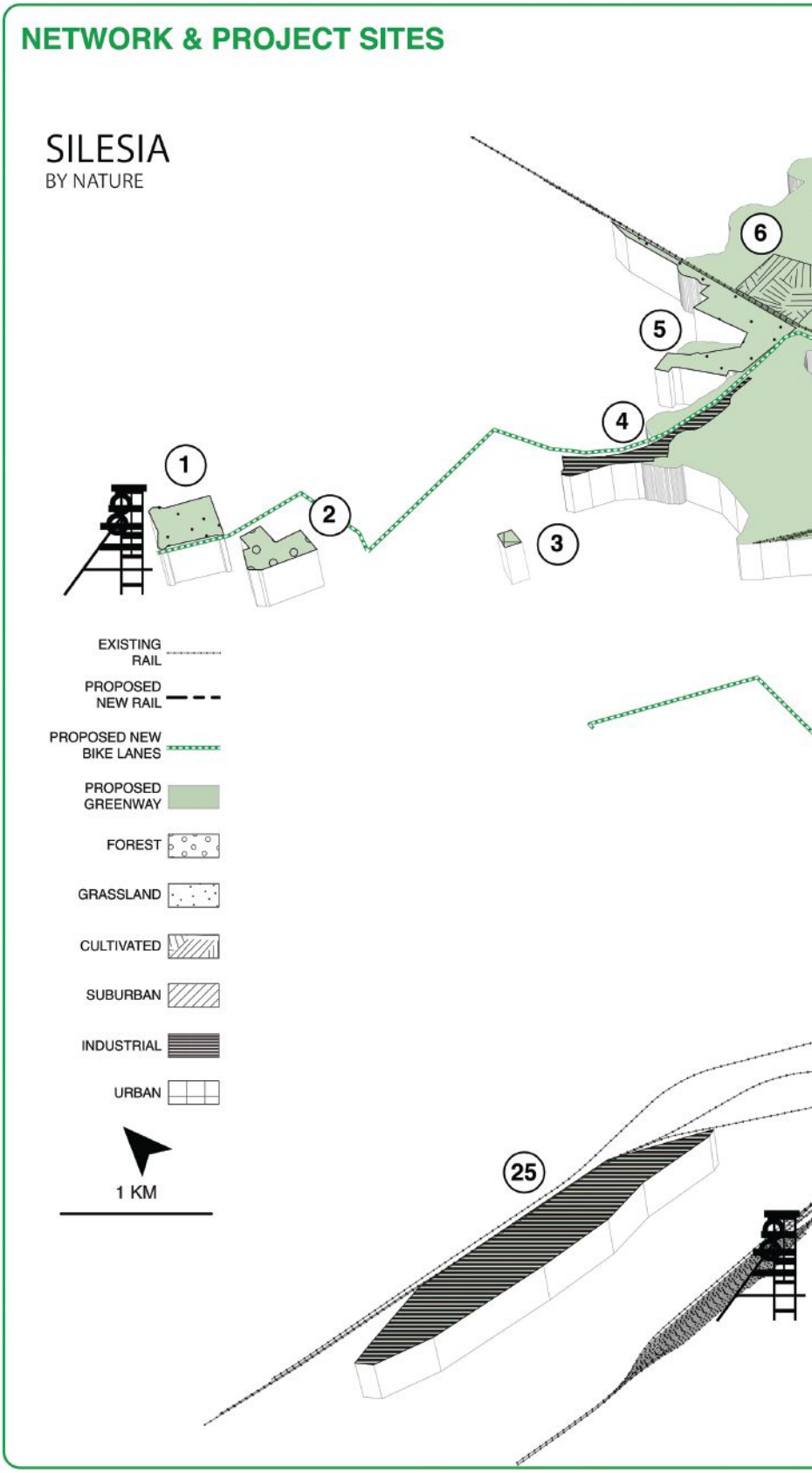
- YES!
- NO. → but why?

the future environmental health of our region is important, both for people and nature... there's funding available to help you address environmental risk within your project, so it's a win-win!

SUPPORT IS AVAILABLE!

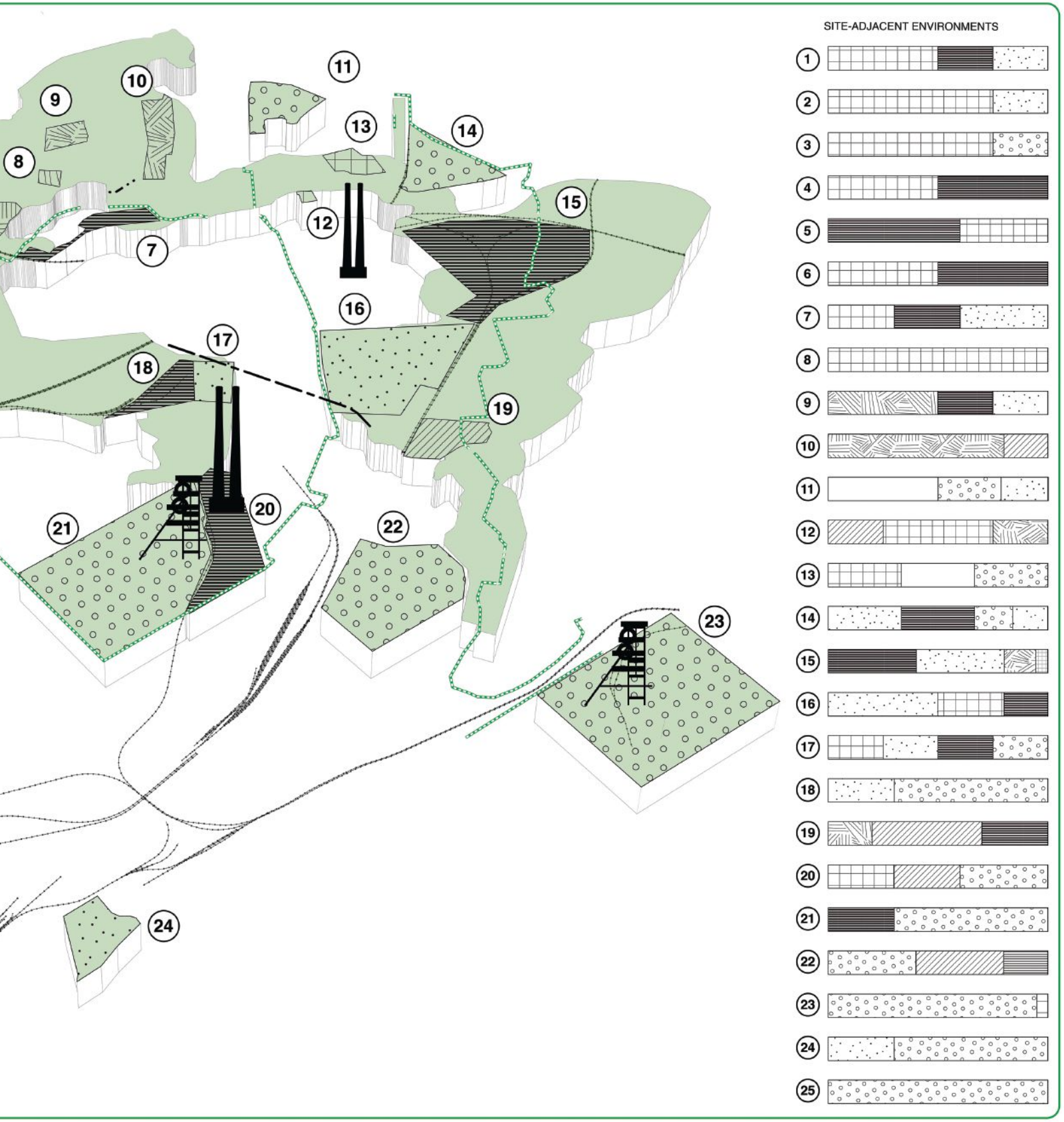
YOUR GROUP OR PROJECT IS LIKELY ELIGIBLE FOR ONE OR MORE FUNDING SOURCES AND USE AGREEMENTS, ESPECIALLY IF YOU ARE PLANNING TO ADDRESS ENVIRONMENTAL RISK AND IMPROVE THE HEALTH OF YOUR PROJECT SITE. GO TO WWW.SILESIABNATURE.PL FOR MORE DETAILS AND FIND THE SUPPORT YOU NEED TO MAKE YOUR PROJECT A REALITY.



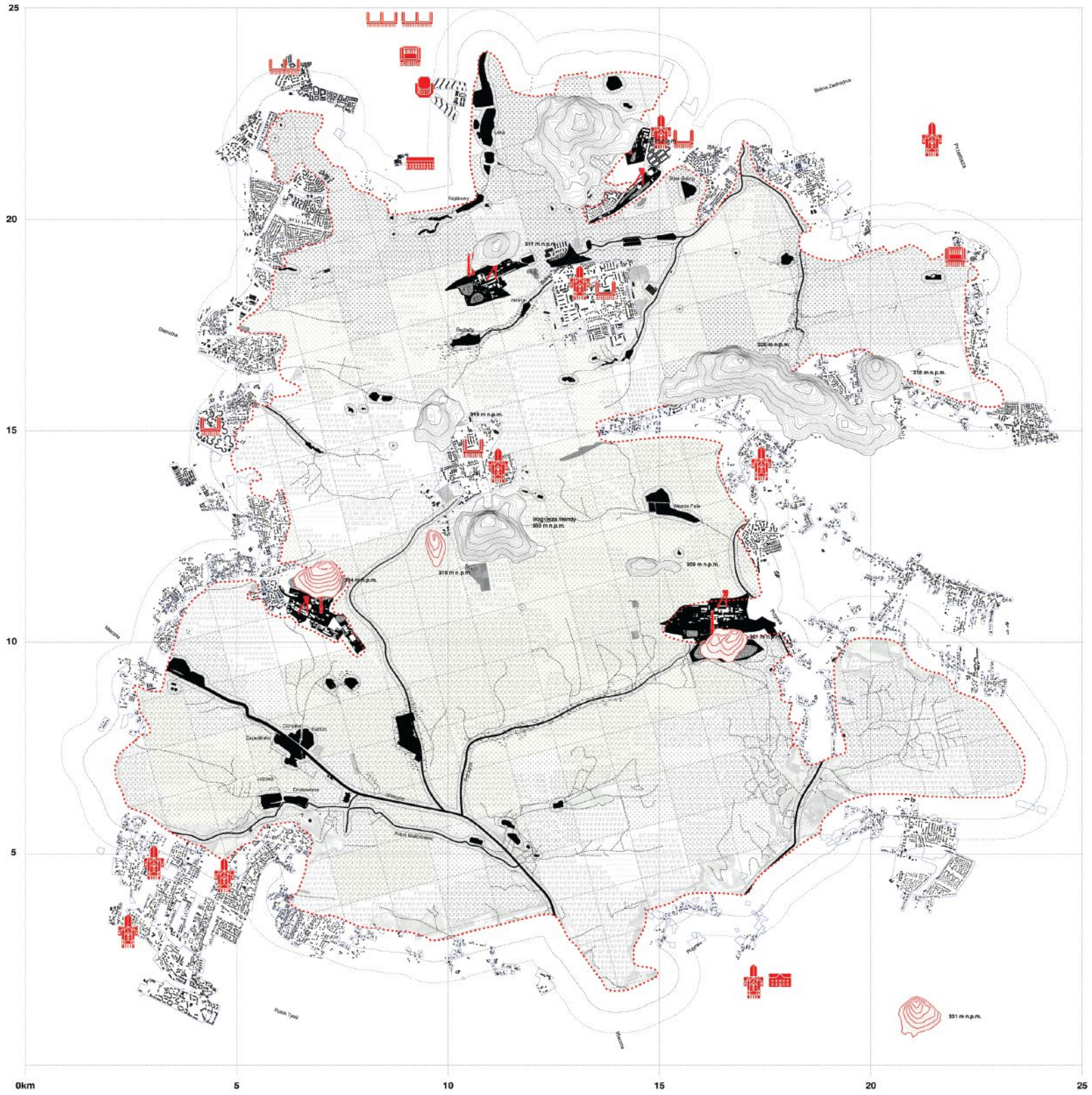


Silesia By Nature

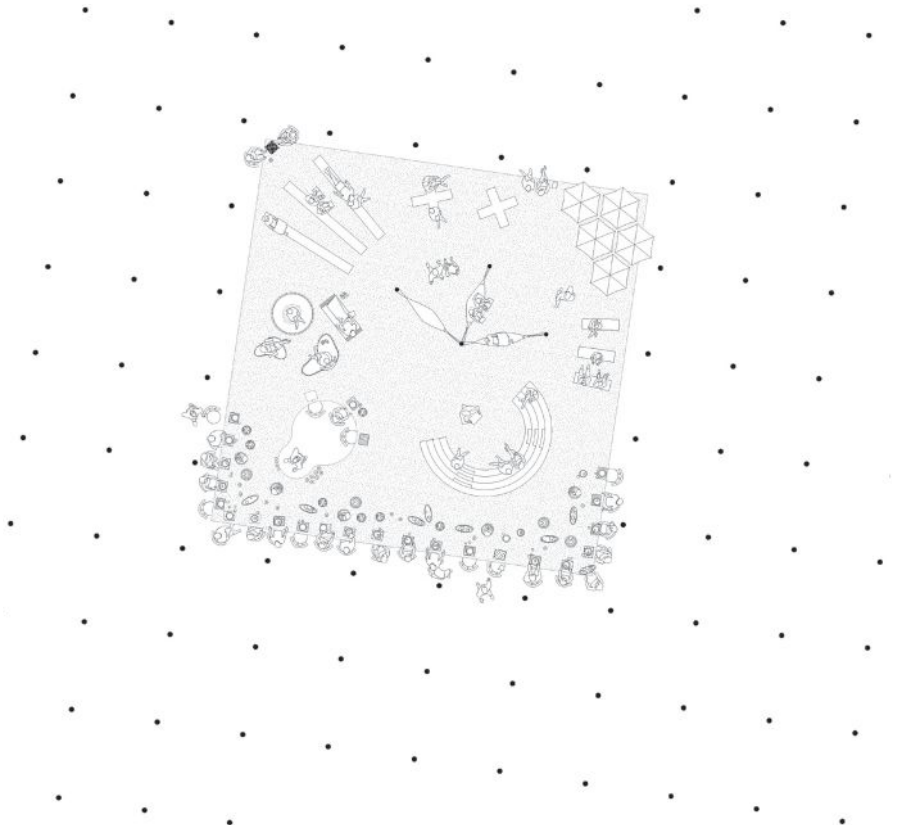
Nayeli Rodriguez and Mario Giampieri, working together, proposed a framework for community-based decision-making to address the redevelopment opportunities in the industrially degraded landscape, particularly around the city of Katowice in eastern Silesia. An app (previous spread and right), backed by a marketing campaign (above), allows residents and stakeholders to map out potential projects that range from new temporary housing to the historic preservation of existing structures, allowing for community involvement in shaping the new direction of their region.


SITE-ADJACENT ENVIRONMENTS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Region Plan Showing Population Centers and Potential Sites



Site Plan for Cultural Gatherings



The Civic Forest

Forests cover about 30 percent of Silesia, but they have been degraded by decades of pollution and industry. The team of Giovanni Bellotti, Alexander Wiegering, Diana Ang, and Kelly Leilani Main looked at how to reinvigorate the woodlands and reconnect them to the community as a natural resource. In particular, the students looked at the logging cycle, which creates clearings whose locations change each year. They proposed cultural programming centers around a large community table or gathering space that could be moved from one clearing to another over the course of the season.

LIBERATION SQUARE 01

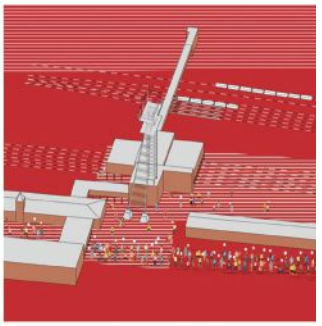
plac Wyzwolenia 21, 40-423 Katowice
06:00 - 09:30 | 3.5 hrs
00:00 - 23:59

Z Kopalni and the events of the day begin in the mining estate located in the northern area of Katowice forest, at Liberation Square which was established as part of the Nikiszowiec mining settlement in 1907. Following the tradition of the mining brass band playing through the streets of the neighborhood to wake up the residents of the estates, spectators gather in front of the Parish of St. Anne. Partnering with the primary school adjoining the church, the grounds are invigorated with people joining for breakfast and morning activities. Beyond the school, a segment of the abandoned light gauge rail offers space for resident artists preparing floats for the day.

GIESCHE MINE 02

KWK Wieczorek Szyb Pulaski
09:30 - 10:30 | 0.75 hr
09:00 - 20:00

The procession moves outside of Nikiszowiec's historic familok and south past the iconic stacks of the Giesche Mine along Szopienicka Street. This street is a key thoroughfare that has connected districts and mines since the early twentieth century. It passes the former city hall of Janow, apartment blocks, previous mining buildings and infrastructural lines. After the Giesche Mine closed, dividing fences were removed and notable buildings facing the street were converted into a new transportation center that is a potential arrival point for visitors.



PRYZJAZNA STREET 04

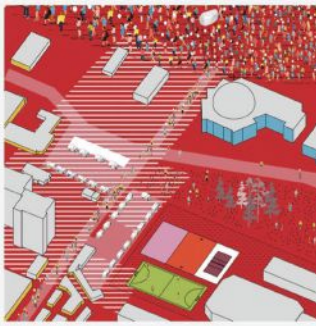
Mila 3, Katowice
11:30 - 11:45 | 0.25 hr
11:00 - 16:00

The path continues into Giszowiec along Pryzjanza Street and the procession here starts to swell with participants coming from the neighboring multi-family and single-family residential community. For those that will remain in Giszowiec, one can participate in day-long planned events in the courtyards of the historical Plattenbau housing units allowing for an exciting communal experience. One can also view the passing procession from balconies and windows of these buildings, while others may join on the street to move to the next destination of *Z Kopalni*.

MARKET ALLEY 05

Młodzieżowa 10, 40-485 Katowice
11:45 - 13:00 | 1.25 hrs
11:00 - 20:00

Next, the route loops to the north through Pod Lipami Square, passing by a line of Beech trees planted over 100 years ago. This is the district's unofficial market square, once hosting regular fairs and providing a community bakery, butcher shop, grocery store and hardware shop. Products were offered at low prices under the administration of the Staszic Mine which is close to Giszowiec. An adjacent alley is now developed as a new central market to build on existing small business operations in the area. The regular events in this market street attracts entrepreneurs and businesses from across the region. On this day the parking lots are temporarily occupied by a variety of food trucks and kiosks.



BARBARA POND 07

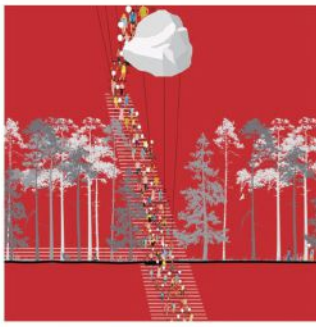
Barbara, 40-001 Katowice
14:15 - 15:00 | 0.75 hr
09:00 - 18:00

Following the stream of the Bolina westward, the path continues to Barbara Pond, the larger of the two water bodies. Several pedestrian routes end in here from the surrounding forest. The site offers opportunities for children and adults to learn about the region's water systems in connection with surrounding mining activities. Over time, as the Staszic Mine closes, the route along the mine will be co-opted in *Z Kopalni* to include the remains and adaptation of the facilities.

FOREST TRAIL 08

Goetla 9, 40-001 Katowice
15:00 - 15:15 | 0.25 hr
08:00 - 18:00

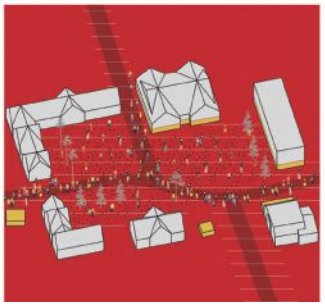
Leaving the territory of the two ponds, the path narrows to move south through the surrounding forest. This duration of travel allows participants to have a more exploratory and engaging experience with the forest. Adjacent clearings are occupied as camping grounds for visitors in close proximity to the ponds. As the procession approaches the next destination in Murcki town, the residents hear the sounds of the processions that spreads across the forest before they emerge out of it.



JAN KASPROWICZ SQUARE 10

plac Jana Kasprowicza 5, 40-749 Katowice
16:00 - 17:30 | 1.5 hrs
9:00 - 20:00

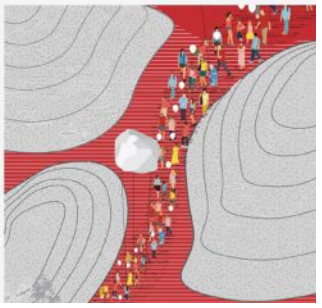
Continuing through Murcki, the path connects to Jan Kasprowicz Square which serves as a meeting point for the community. A large community dinner takes place in this public space prior to moving out of the town, with the regional cuisine preparations served out of the surrounding community kitchens.



MURCKOWSKI PARK 11

Lędzińska, 40-749 Katowice
17:30 - 19:30 | 2 hrs
09:00 - 21:00

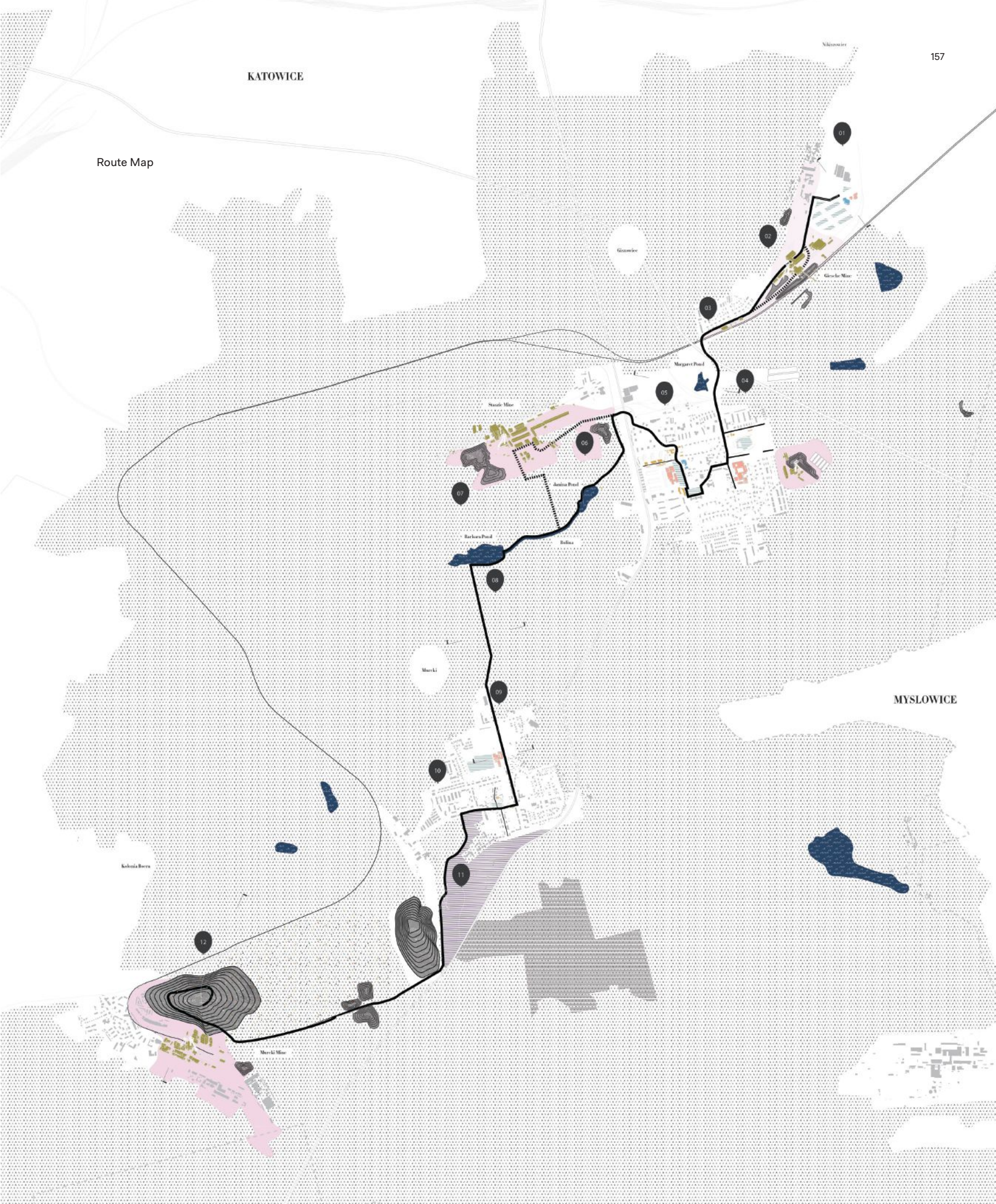
The procession transitions from the town through Murckowski Park which occupies 9.83 hectares. The park is adjacent to Las Murckowski Forest nature reserve which aims to protect the remains of the ancient Forest of Silesia and was created in 1953. Also adjacent are the landscape remains of the mining activities in the form of mounds. These spoil tips, which were once a dump-sites of mining wastage, are now overtaken by unique vegetation and offers views of the entire forest.



Z Koplani: Out of the Mines

Ranu Singh, Daya Zhang, and Monica Hutton developed a narrative around a traditional Miners' Day festival in the region, tweaking it to draw stronger social and economic ties between the various Silesian mining communities. They devised a scheme for cultural events that celebrates community heritage with programming along a specific geographic route, and their plan even addressed year-round fund-raising goals that could make the project a reality.

Route Map

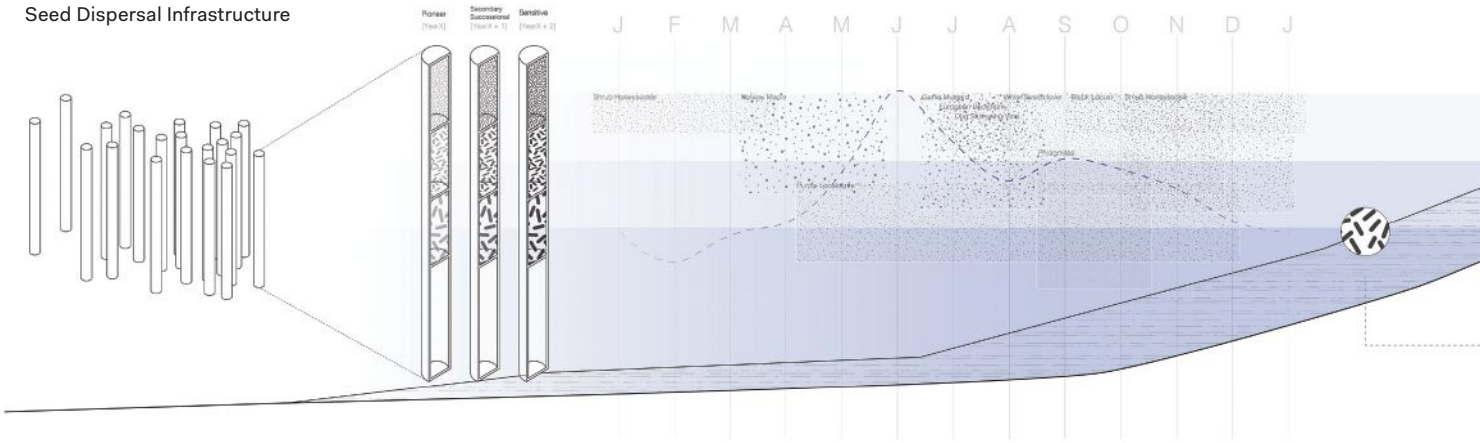

KATOWICE
Nikiszowiec
Giszowiec
Giesche Mine
Margaret Pond
Staszic Mine
Janina Pond
Barbara Pond
Bolina
Murcki
MYSLOWICE
Kolonia Boera
Murcki Mine
01
02
03
04
05
06
07
08
09
10
11
12

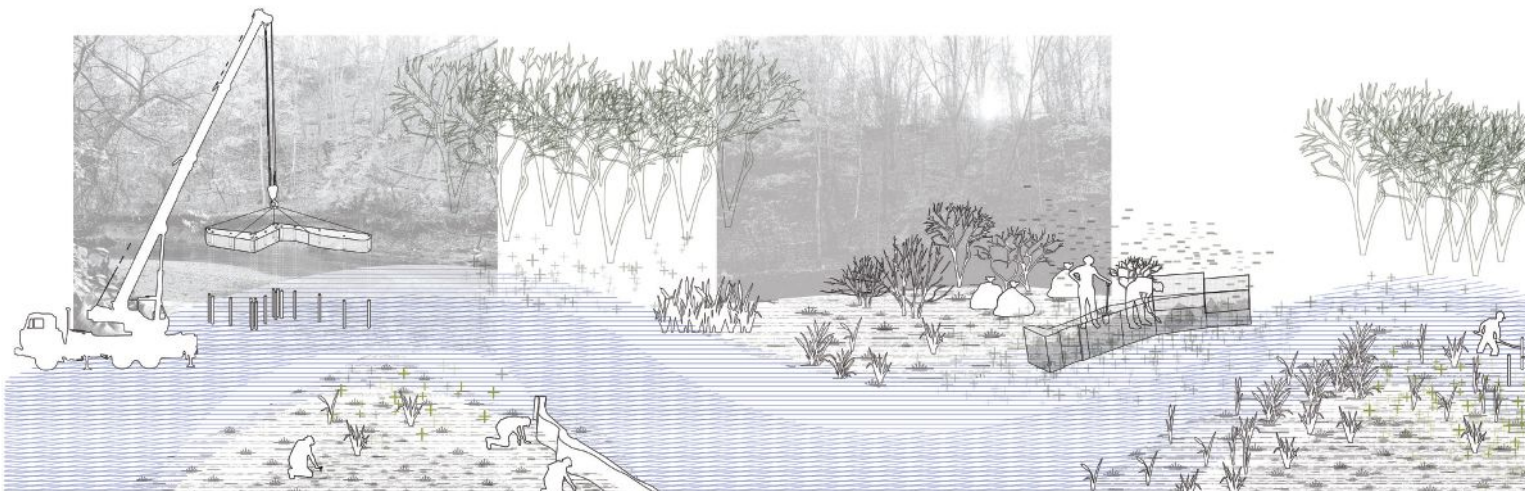
Sloan Award
Toronto Ravine Re-Create

University of Toronto
John H. Daniels Faculty of Architecture, Landscape, and Design

Project Credits
Course: Toronto Ravine Re-Create
School: University of Toronto, John H. Daniels Faculty of Architecture, Landscape, and Design
Level: M.Arch., without preprofessional degree (year three), Master in Landscape Architecture (year three), Master in Urban Design (year two)
Duration: Fall 2016 semester
Instructor: Alissa North (associate professor)
Students: Andrew Hooke, Rachel Salmela, Tianjiao Yan, Zhoufan Wan, Yuan Zhuang, Anna Varga-Papp, Stephen Brophy, Asuka Kono, Leonard Flot, Kangning Zhao, Kamila Grigo, Christina Boyer, Hannah Soules, Xinyu Hao (submitted projects)
Collaborators: The City of Toronto; Evergreen Brick Works; the Toronto and Region Conservation Authority

Seed Dispersal Infrastructure





Studio Brief:

This cross-disciplinary, upper-level master's design studio asked students how rivers and ravines could be repositioned as living and dynamic systems within a city. Focusing on Toronto's two main waterways, the studio built on city government work already in process to propose new and innovative ideas for developing stronger connections between the rivers and the urban core.

Investigation:

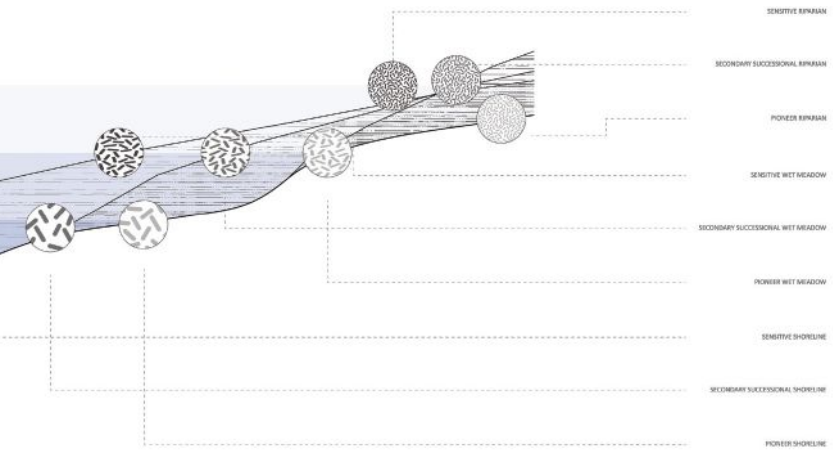
The Don River and the Humber River weave through the heart of downtown Toronto, but they're often regarded as separate from the urban life of the city. Associate professor of landscape architecture Alissa North has studied rivers for years, and she argues these two in particular are more than just visual assets. The city government has developed a draft strategy for how to address the rivers and the surrounding ravines. Students worked with the city to build on that plan and develop design ideas for implementing it.

Through mapping, hydrogeological studies, and digital and physical modeling, the students analyzed the rivers as systems, and considered the environmental, social, infrastructural, and economic roles the two waterways could play in broader civic life.

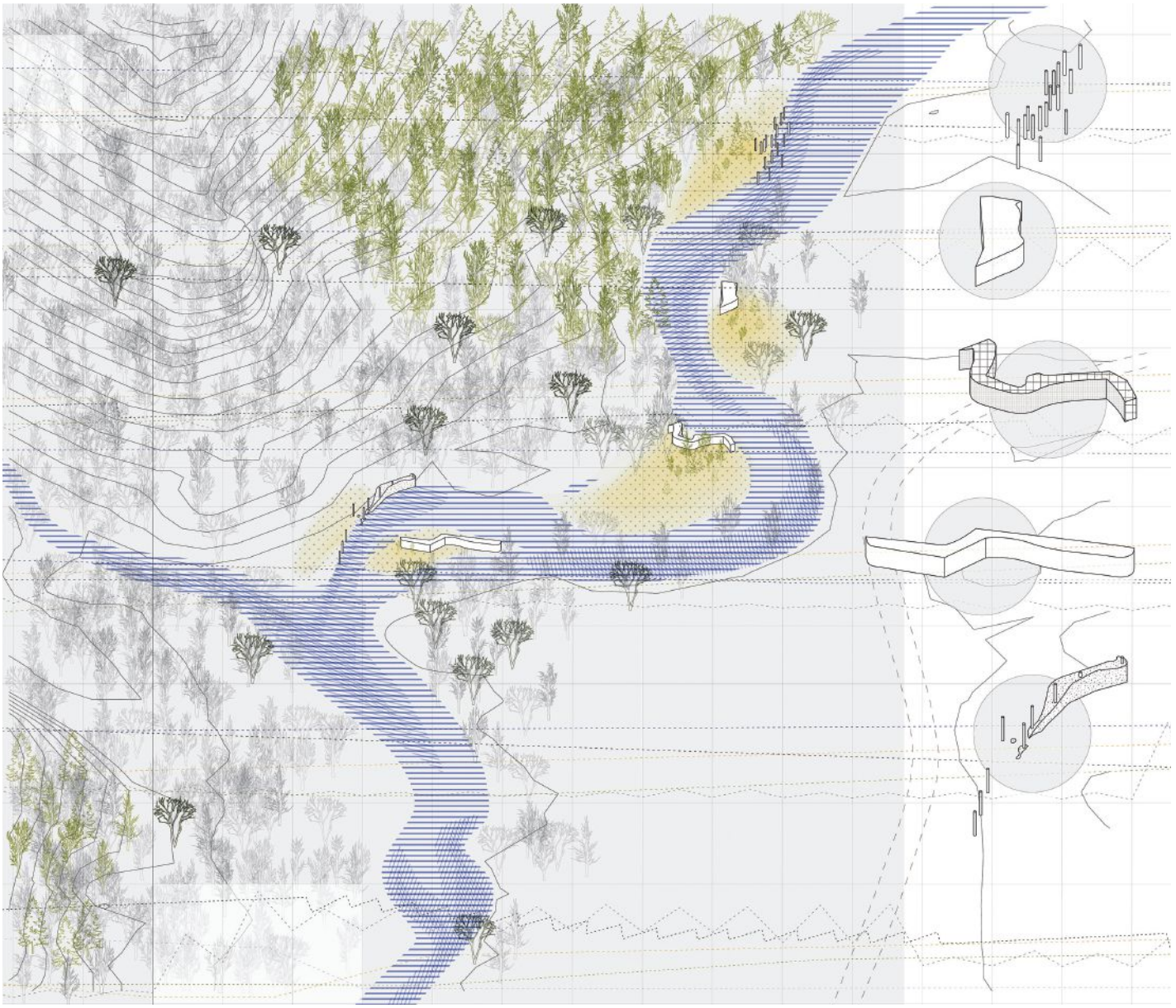
Students were divided into three groups: One focused on interventions that could happen within the rivers themselves and along their edges, another concentrated on the variable flood plains of the rivers and the steeper slopes of the ravines, and the third explored the urban-scale interactions of city and river, looking for opportunities of symbiosis. Their concluding projects—which some of the students developed into masters theses—propose methods to catalyze the transformation of the ravines.

Though largely landscape focused, the studio was open to students from both architecture and urban design—part of an effort to expose students across departments to new ways of designing. "It's less about the discipline and more about how students can think at all scales," North says.

In awarding the Sloan Prize for investigations into sustainability and water conservation, the jury applauded the studio's focus on both formal and urban solutions. "There's a clarity and real sophistication of production," juror V. Mitch McEwen said.



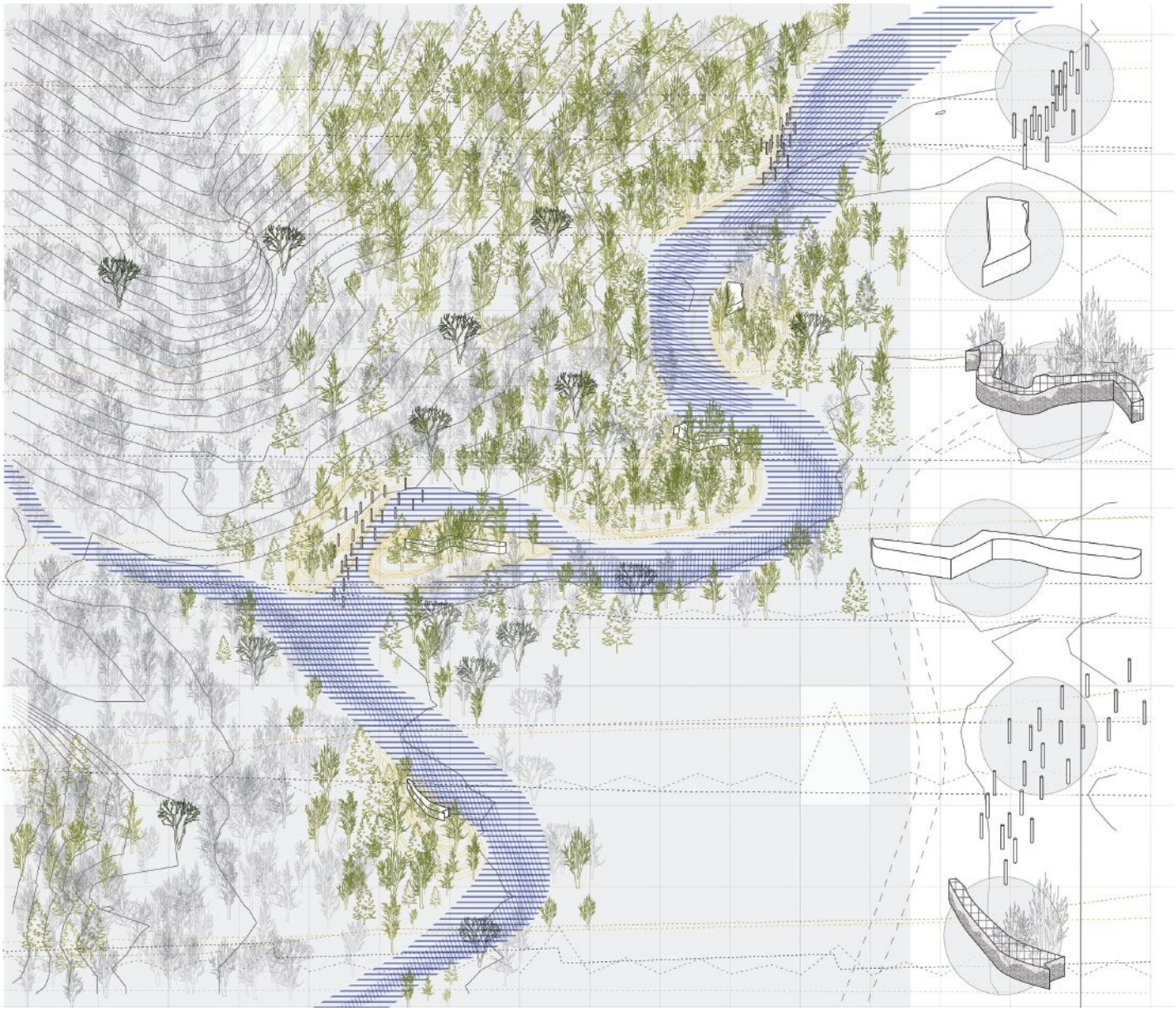
Plan of Built Interventions in the River



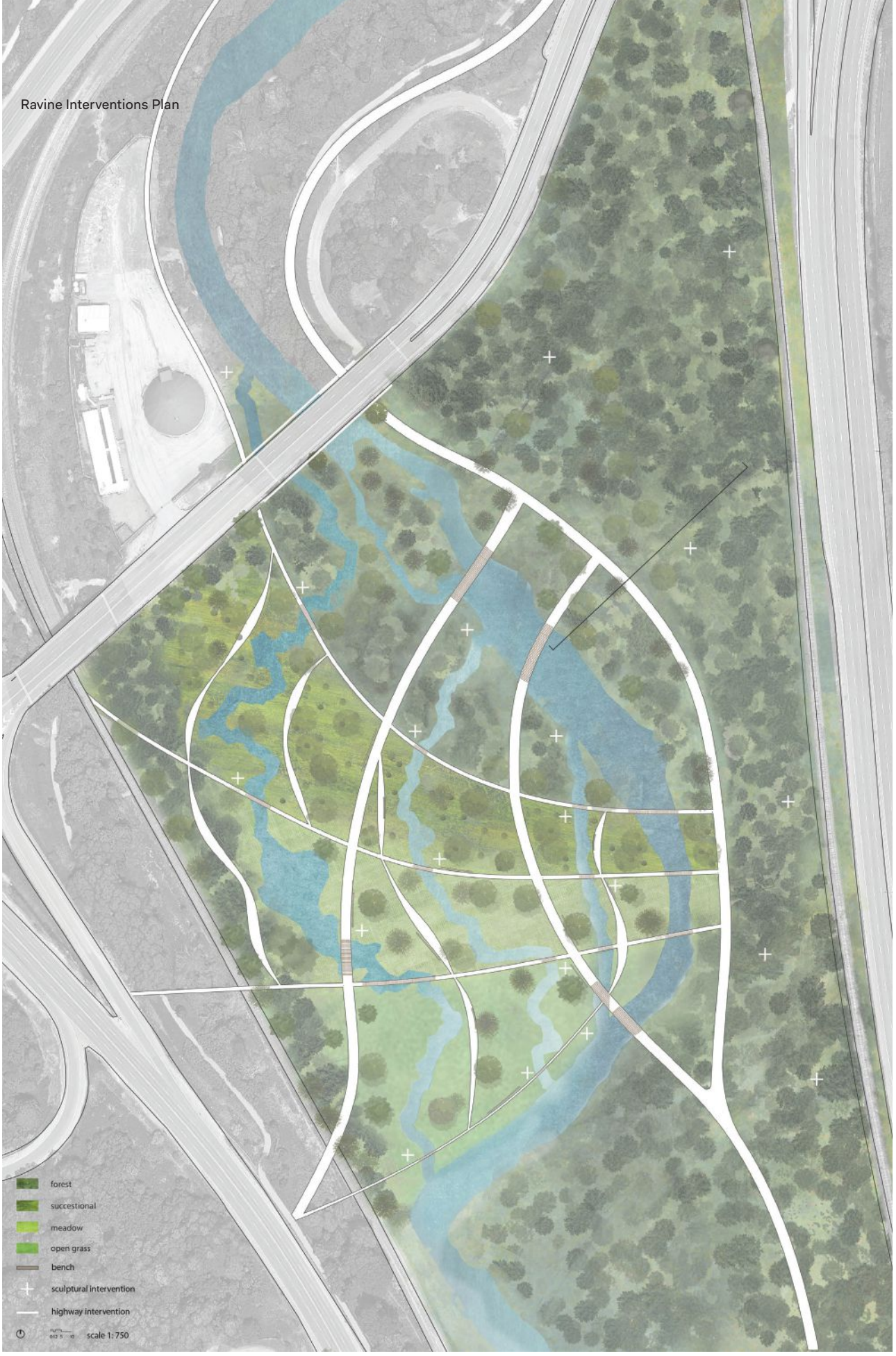
The Rivers

Andrew Hooke's analysis at the level of the rivers examines how sediment and seed dispersal can, over time, help to change and reinvigorate the landscape (above and facing page). Built interventions such as benches, lookout points, and bridges help to engage area residents with nature. His proposal includes dotting the river itself with vertical rods containing seeds from a variety of native species that can be dispersed by the flowing water, augmenting the natural landscape and repopulating local flora over the seasons (previous spread).

Built Interventions After Plant Regrowth

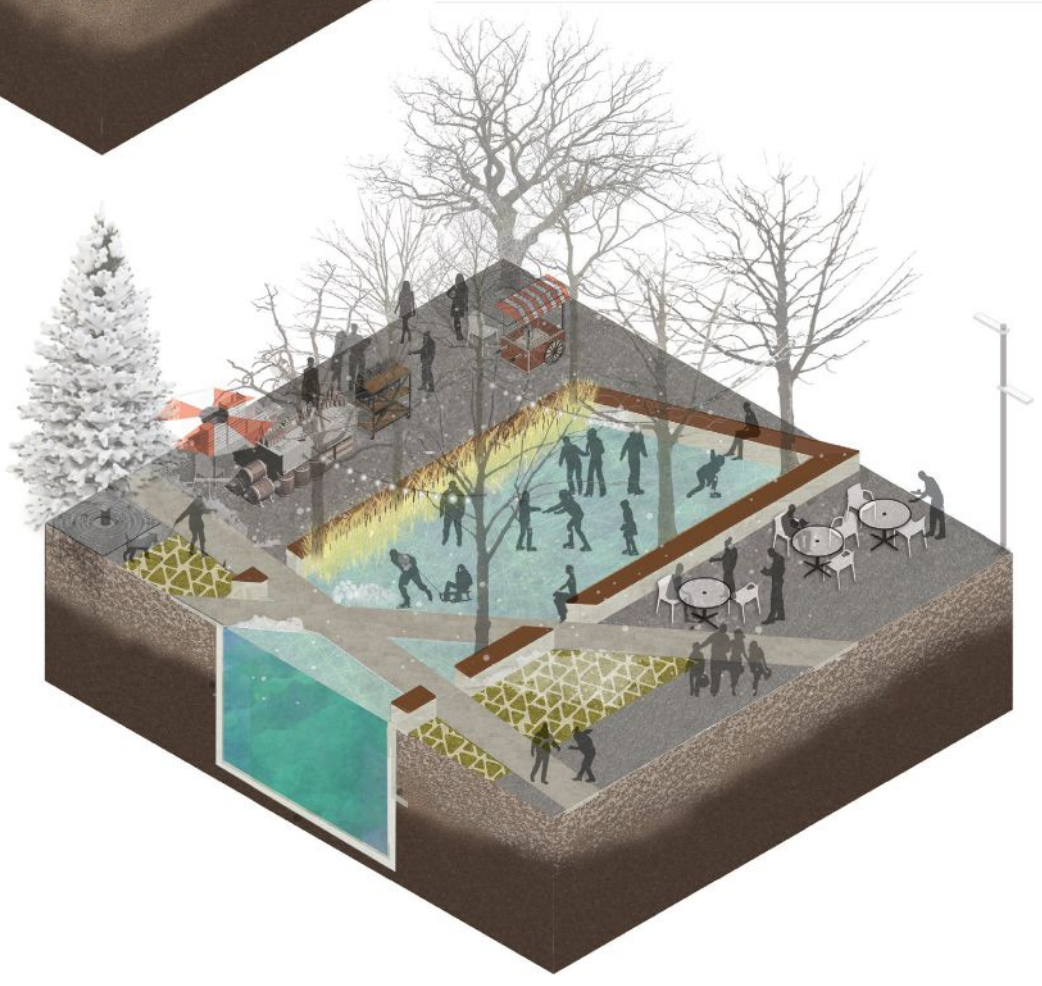


Ravine Interventions Plan



The Ravines

Kangning Zhao's investigation of the ravines in and around Toronto led to a proposal that uses landscape as infrastructure to help redirect water flow and manage flooding. In order to encourage area residents to engage with the natural landscape of the ravine, the project incorporated pathways, benches, meadows, and bike trails. Sculptural interventions will double as wayfinding devices to help people navigate their way around. A planting strategy encourages the growth and spread of native flora.



The City

Projects focused on the city level explored how to foster links between the natural ravines and the urban context of Toronto. Hannah Soules looked into how stormwater runoff can be reclaimed in a greenway in the downtown core, bringing both native plantings and public programming to the neighborhood (right). Farmers markets and cafés help activate the streetscape and encourage the connections to water. The canal in Soules' plan can shift uses depending on the season—from a landscaped waterway in the summer to an ice skating rink in winter (opposite).

You *Can* Replicate Original Steel Windows.

Meet The SR6700.

Authenticity, Reliability and Strength.

Steel windows from the early 20th century were big, with true divided lites and single pane glass. Accurately reproducing them means incorporating modern materials and insulating glass to create a contemporary version of this classic design.

Graham's innovative SR6700 meets the challenge. This authentic look is achieved with large openings, minimal sightlines, applied grids and even a floating vent. So authentic that we have helped numerous projects attain National Park Service historic approval. Bring your vision to life. Call Graham.

Learn more about Graham's SR6700: **grahamwindows.com/AR67**

YOUR VISION. OUR EXPERIENCE.

GRAHAM
ARCHITECTURAL PRODUCTS

grahamwindows.com 800-755-6274

Architectural Windows | Window Wall | Curtain Wall | Doors

Starrett-Lehigh Building, New York City

Refined

Featuring Cosmo Pendant

- High/Low lumen output options
- 3000K, 3500K, 4000K
- Optional 90+ CRI

visalighting.com/products/cosmo

VISA LIGHTING

Because our expectations are as high as yours. Discover the difference at marvinwindows.com.

MARVIN Windows and Doors

Built around you.

Designed by Adams Architecture, Seattle, Washington

Residential:

Eero Saarinen's Penn Dorms Reopen

TEXT BY SARA JOHNSON

In August, the first batch of University of Pennsylvania students moved into the spiffed-up Eero Saarinen–designed Hill College House, a 195,000-square-foot women's residence hall built in 1960. (The dorm has since gone co-ed.) Entered via a bridge over a "moat" on the west side, the five-story brick structure contains an expansive atrium with a dining hall below. Princeton, N.J.–based Mills + Schnoering Architects led the $80 million renovation, which included replacing the M/E/P systems and roof, installing LEDs in the atrium, upgrading the kitchen, and adding an elevator and air conditioning. Philadelphia's Olin updated Dan Kiley's landscape.

AISLINN WEIDELE

> *For more information and images about the Hill College House renovation, visit ARCHITECT's Project Gallery at bit.ly/HillCollegeHouse.*

Expressive Lines Embellish Screen-Printed Wallpapers

TEXT BY SELIN ASHABOGLU

Cosmic Splash, Aimée Wilder
Part of New York–based designer Aimée Wilder's new Phantasmagoria collection, Cosmic Splash is a bold pattern on FSC-certified paper. This outer space–inspired wallpaper repeats every 36", and is available in nine matte or clear-gloss colorways. *aimeewilder.com*

Bomba, Juju Papers
There is a subtle rhythm to the irregularity of Bomba, a new wallpaper collection covered in squiggly lines that resemble doodles on a sketchpad. Bomba's pattern repeats every 36", and was created using water-based inks. Available in six colorways. *jujupapers.com*

Dither, Flavor Paper
Designed by Brooklyn, N.Y.–based artist Mark Dean Veca, Dither's arrangement of layered, curved lines gives the impression of three-dimentionality. The wallpaper's pattern repeats every 9", and comes in four colorways on clay-coated paper. *flavorpaper.com*

> *For more wall-covering products, visit bit.ly/ResidentialWallpaper.*

SECURITY WITH STYLE

WHERE PERFORMANCE AND DESIGN INTERSECT

Horton AUTOMATICS

SentryLane™ Optical Bi-Parting Glass Barriers from Horton combine an advanced beam scan optical detection solution with sophisticated motion control technology to provide a superior high security entrance system with a classic look. The frameless glass barriers – available in a variety of heights and widths – coupled with the brushed stainless steel pedestal provide a clean, open feeling that complements any setting. To learn more about our complete line of optical speed gate security solutions, contact Horton today or visit us at ASIS International.

hortondoors.com

Visit us at ASIS, Booth #1033 / September 25 - 28, 2017

Early Alison and Peter Smithson House Hits the Market for the First Time

TEXT BY SARA JOHNSON

Even as Alison and Peter Smithson's famous Robin Hood Gardens is being demo'd and redeveloped, an earlier, much smaller project by the late architect pair has been listed for sale. Designed for Arup acoustic engineer Derek Sugden and his wife Jean, the modest two-story house in Watford, England, is listed at press time for £1.2 million (about $1.6 million) by real estate agency the Modern House.

The Sugden House was added to the National Heritage List for England in 2012 with a Grade II status, and, according to Historic England's report, the house as built was not the first the architects designed for the site. The Sugdens reportedly declined a butterfly-roof design by Alison, and later accepted a gable-roofed version by Peter that reversed Alison's plan orientation. In the agreed-upon scheme, Alison focused on the interior and Jean Sugden worked on the landscaping.

On the exterior, metal casement windows with L-shaped openings punctuate the brick façade. Loliondo-teak strip floors run throughout the first-floor living spaces, with polyvinyl tiling in the kitchen, dining area, and hall. Upstairs, the ceilings of the four bedrooms are lined with French-polished Columbian matchboard. "[T]he design of the completed house combines the visionary aesthetic of the Smithsons with the indelible stamp of their clients," notes Historic England.

According to *The Guardian*, Jean Sugden died in 2007, and Derek lived in the house until his death in 2015. Whoever buys this house will be only the second owner in its 61-year history.

COURTESY THE MODERN HOUSE

> *See more images of the Sugden House at bit.ly/SugdenHouse.*

SILENT GLISS 65th ANNIVERSARY

SILENT GLISS OPENS IN SOHO

Be inspired and follow us on twitter.com/SilentGlissInc
like us on facebook.com/SilentGlissInc

Silent Gliss is the leading global premium supplier of motorized and manual curtain and blind systems.

We offer our customers the very best in quality, technology and service. Custom-made products with Swiss ingenuity!

COME SEE US AT OUR NEW SOHO SHOWROOM LOCATED AT:

Silent Gliss Inc.
304 Hudson Street
Suite 402 B
New York NY 10013

T 718-412-9040
info@SilentGlissAmerica.com
SilentGlissAmerica.com

SilentGliss

hive

housing innovation,
vision & economics

DECEMBER 6–7, 2017
INTERCONTINENTAL
DOWNTOWN LA

trust and transformation:

HOW INNOVATION WORKS

HIVE is the marquee event in the nation that touches every aspect of housing. Join the best and brightest construction and design professionals, academics, and thought leaders from an array of industries passionate about design, business strategies, and innovation to stimulate new ideas and shape the future of how people live, work and play.

Passes are limited.

Register Today!

AR.hwhive.com

Keynote
Steve Case
Chairman and CEO, Revolution LLC; Co-Founder, America Online and Author, *The Third Wave*

Keynote
Chip Conley
Head of Global Hospitality and Strategy, Airbnb

Carlo Ratti
Founding partner at Carlo Ratti Associati

Jason McLennan
CEO, McLennan Design; Founder/Creator, Living Building Challenge

Maura McCarthy
Co-founder, VP Market Development, Blu Homes

Eve Picker
Founder, Small Change

James Chung
President, Reach Advisors

Title and Underwriting Sponsor

Ply Gem BUILDING PRODUCTS

Founding Sponsors

Electrolux · LP BUILDING PRODUCTS · THE BOLD LOOK OF KOHLER · SAMSUNG

Alliance Sponsors

DUPONT Tyvek · MITSUBISHI ELECTRIC COOLING & HEATING · REDWOOD REAL. STRONG. · Humboldt Redwood · Whirlpool

hanleywood

ARCHITECT

The Journal of the American Institute of Architects

Residential design is the most personal and immediate touchstone for the impact architecture has on our lives.

Hanley Wood congratulates and thanks Jenn-Air for its ongoing commitment to excellence and innovation in home design.

JENN-AIR®

hanleywood









WE REDEFINE THE KITCHEN

Designers are no longer constrained by standard cooktop configurations. Jenn-Air's new modular cooktops redefine the idea of what a cooking surface can be. Modular cooktops provide a wide range of options for customization that create a unified look whether traditional or flush installation is specified. No matter what the cooking style or design sensibility, Jenn-Air® modules propel every kitchen to be exceptional.

IMAGINE THE POSSIBILITIES WITH MODULES

Each cooking module is 21" deep and 15" wide. When combined, they create a highly customized, seamless cooking area while delivering best-in-class performance. Combine multiple units for large cooktop areas, or use fewer for small spaces such as bars, prep stations or city apartments.

There are currently six units from which to choose. Mix and match modules. Combine induction and gas technology. Kitchen design will never be the same.

For those who crave induction technology, Jenn-Air offers both a cooktop with a flexible element to accommodate various sized cookware and a unique induction wok that features a concave design to cradle the round-bottom pan. Both of these induction modules deliver fast, efficient and highly responsive cooking power.

For those who desire gas, designers may choose from a 2-burner cooktop module and/or a single-burner cooktop module with a wok ring. The single-burner offers BTU output that ranges from a gentle 700 BTUs to a commercial-grade 20,000 BTU output, the highest of any Jenn-Air product.

To round out the product offering, a chrome-infused, electric griddle delivers 1,800 watts for faster cooking while radiating less heat into the kitchen.

All modules may be paired with either a standard updraft ventilation system or with a new, sleek 4" downdraft vent. This downdraft vent works efficiently with any of the modules without interrupting kitchen sightlines.

Now there is no limit to what you can create in the kitchen.

For more information, jennair.com.

JENN-AIR

1330 Brook Street Residence
Lawrence, Kan.
Studio 804

TEXT BY EDWARD KEEGAN, AIA
PHOTOS BY COREY GAFFER

Each spring, the University of Kansas mints a new crop of graduates and professor Dan Rockhill's not-for-profit Studio 804—filled with graduate students from the school's architecture program—completes a smart new sustainable building in the Lawrence area. The studio has been doing this for more than two decades, but that doesn't make the annual nine-month-long design/build process any easier.

There were just 10 students for the 2016–17 academic year, half of Rockhill's usual number, and the professor's sole concession to his smaller workforce was keeping the building to a small footprint. The studio's efforts resulted in a 1,300-square-foot, net-zero energy single-family house designed to a LEED Platinum standard. The house is located at 1330 Brook Street, an infill site in a predominantly residential neighborhood that Rockhill describes as "marginal." Doing a smaller house helped to meet the site's market requirements as well, with a projected selling price of $249,000 versus the more-than $325,000 for previous Studio 804 projects.

Studio 804 is the ultimate DIY architecture class, overlaid with an unyielding dedication to good modern design. Many parts of this year's two-bedroom, two-bathroom house incorporate leftover materials from previous years' projects, which are stored in a large warehouse that also functions as the studio's shop and classroom. Large 11-foot-tall by 5-foot-wide glass panels—which supply the public spaces with ample daylight—were acquired inexpensively five years ago from a failed project in Kansas City. Engineered lumber for the roof was "in stock," as Rockhill puts it, as was the steel from which the students fabricated the exterior screens. The western red cedar exterior soffit was left over from siding used in last year's house at 1200 Pennsylvania Street. "I'm able to manipulate the use of materials," Rockhill says. Steel panels were repurposed from a local commercial project that had rejected the material, and the team power-washed and painted the panels for the house's exterior.

Rockhill cites the prefabricated, enameled-steel houses produced by Lustron in the postwar years as a precedent for the design's black-metal-paneled enclosure. "They [Lustron homes] were aquamarine and pink," he says, noting that breaking with locally prevailing hues is part of the design equation.

Despite being completed this year, 1330 Brook Street has already sold. The house's success is attributable to a particular culture that Rockhill and his Studio 804 classes have shaped over more than a generation. "There's an interest in LEED and modern design in Bob Dole country," Rockhill says, but "there's nobody else doing this."

Floor Plan

Previous Page: A porch on the house's west side faces the street.

Opposite, Top: The predominantly opaque envelope on the north side of the house contrasts with a steel screen on the south.

Opposite, Left: Only 24 feet wide, the house tucks neatly into the suburban infill site.

Opposite, Right: The steel screen along the south façade provides shade and reduces solar gain.

Opposite, Top: A set of interconnected spaces serves as living and dining room. In an adjacent space (at rear), the owners can accommodate overnight guests by drawing the curtains.

Opposite, Bottom: The hardware and cabinets were purchased from Ikea and reinforced with steel. Students milled the red oak front cabinet faces, bought at Menards, and fabricated the cold-rolled steel countertops and cabinet ends.

Above: The house contains two bathrooms: one off the master bedroom (shown) and another off the north hall.

The main entrance (at right) opens off the walkway on the house's south side.

Project Credits

Project: 1330 Brook Street Residence, Lawrence, Kan.
Client: Built as a spec house
Architect/Contractor: Studio 804, Lawrence, Kan. · Dan Rockhill (director and distinguished professor); Matthew Anderson, Faysal Bhuiyan, John Coughlin, Abigail Davis, Caitlin Fitzgerald, Brittany Hediger, Evan Liles, Charles Rotter, ASSOC. AIA, Chris Roybal, Emily Stockwell (students)
Structural Engineer: Norton & Schmidt
Size: 1,300 square feet
Cost: $249,000

THE OVEN THAT GOES WHEREVER YOU DO, EVEN IF IT'S ONLY ACROSS THE ROOM.

The new Jenn-Air® Connected Wall Oven. With a stunning, easy-to-use 7-inch touch LCD display, enhanced Culinary Center and a companion mobile app, you'll always stay in control of the kitchen — no matter where you happen to be.

Text CONNECT to 31996 to experience our new oven from your phone.

jennair.com/connect

JENN-AIR®

RESIDENTIAL ARCHITECT DESIGN AWARDS

2016 WINNER CASA IV BY MESURA; PHOTO BY PEDRO PEGENAUTE

HOW TO ENTER

SUBMIT YOUR WORK AT
radesignawards.com

QUESTIONS?

EMAIL rada@hanleywood.com

2017 CALL FOR ENTRIES DEADLINES EXTENDED

REGULAR September 15, 2017
LATE September 22, 2017
(Will include a late fee of $50 / entry)

hanleywood

Residential Architect

ARCHITECT

Advertiser	Page	Website	Phone
ABX 2017	187	www.abexpo.com	
American Hydrotech	109, 111, 113	hydrotechusa.com/power-of-rain	
American Institute of Architects	191	chicagoarchitecturebiennial.org	
American Institute of Architects	17	adfilmfest.com	
American Institute of Architects	78	aia.org/join	
American Institute of Architects	85	aialeadershipinstitute.com	
American Institute of Steel Construction	32	www.aisc.org/ideas2	312.670.2400
American Specialties, Inc.	25	www.americanspecialties.com	914.476.9000
American Standard	16	dvx.com	
Amerlux	87	amerlux.com/cynch	
Andersen Windows & Doors	114	-	
ARCAT	C3	www.arcat.com/charrette	
Armstrong World Industries - Ceilings	C2	armstrongceilings.com/shapes	
Bilco	101	www.bilco.com	
Bison	118	bisonip.com	800.333.4234
Bluebeam	21	BLUEBE.AM/DESIGN	
Cascade Coil	51	cascadearchitectural.com	800.999.2645
Centria	76	CENTRIAperformance.com/nextchapter	
Covestro	54-57	www.covestro.com	
Delta	105	DeltaCommercialFaucets.com	
Dorken	36	dorken.com	
Doug Mockett & Co. Inc.	100	www.mockett.com	800.523.1269
Dri-Design	88	DRI-DESIGN.COM	616.355.2970
Dryvit	97	Dryvit.com/NewBrick	833.NEWBRICK
E. Dillon and Company	112	www.edillon.com	800.234.8970
Ellison Bronze	89	ellisonbronze.com	
Feeney	98	www.feeney15.com	800.888.2418
Florida Tile	102	www.floridatile.com	
Graham Architectural Products	166	grahamwindows.com/AR67	800.755.6274
Guardian Sunguard	53	GuardianGlass.com/commercial	866.482.7374
Hanover Architectural Products	94	www.hanoverpavers.com	800.426.4242
Hive	174	www.AR.hwhive.com	
Horton	171	hortondoors.com	
I3Surfaces	93	www.I3Surfaces.com	888.975.7483
Inter-lux	1	inter-lux.com/request	
Jenn-Air	175, 176	jennair.com	
Jenn-Air	183	jennair.com/connect	
Kalwall	119	KALWALL.COM	800.258.9777
Kolbe Windows & Doors	121	KolbeWindows.com	800.955.8177

** issue mailed in regional editions. Publisher not liable for errors or omissions.*

concrete skin

| sustainable glassfibre reinforced concrete
| non-combustible (ASTM fire rating) and maintenance free
| natural and durable material, authentic appearance
| various colors and shapes, vivid surface

Distributed by Rieder North America
1-877-740-0303 (toll free) | usa@rieder.cc | www.rieder.cc

RIEDER

Advertiser	Page	Website	Phone
LaCantina Doors	110	LaCANTINADOORS.COM	
LP FlameBlock	13	LPCorp.com/FlameBlock	
Lutron	C4	lutron.com/shadesbylutron	
Marvin Windows and Doors	168	marvinwindows.com	
Mitsubishi Electric Cooling & Heating	62-65	mitsubishipro.com	
modulararts	96	modulararts.com	
Mule-Hide	120	mulehide.com	800.766.1492
NanaWall	35	NanaWall.com	800.873.5673
NBK	23	NBKUSA.com	
Nichiha USA	11	nichiha.com	866.424.4421
Oldcastle BuildingEnvelope®	2-3	obe.com	866.Oldcastle
Ornamental Metal Institute of New York	10	WWW.OMINY.COM	866.282.9298
Owens Corning	66-69	www.owenscorning.com	
P/A Awards	39	www.paawards.com	
PCI	27	PCI.org	
Petersen Aluminum	15	PAC-CLAD.COM	800.PAC.CLAD
Phifer	12	phifer.com/suncontrol	800.221.5497
PPG Industries, Inc. (Architectural Coatings/Paints)	117	PPGPAINTS.COM/ARCHITECT	
reThink Wood	37, 40-41, 58-61	rethinkwood.com	
Rieder	189	www.rieder.com	877.740.0303
SAFTIFIRST	31	www.safti.com	888.653.3333
Seiho International	107	www.seiho.com	626.395.7299
Seria Pacific Windows	18-19	www.SirraPacificWindows.com	800.824.7744
SilentGliss	173	SilentGlissAmerica.com	718.412.9040
Simpson Strong-Tie	33	go.strongtie.com/firewallsolutions	800.999.5099
Steel Institute of New York	14	WWW.SINY.ORG	
Sunbrella	4-5	FUTUREOFSHADE.COM	
TAKTL	7	WWW.TAKTL-LLC.COM	412.486.1600
Tamlyn	70-75	www.xtremeias.com	844.365.9462
The Home Depot	29	HOMEDEPOT.COM/HAMPTONBAYCABINETS	
The Modern Fan Co.	99	modernfan.com	
The Sustainable Sites Initiative	52	sustainablesites.org	
The Valspar Corporation	43, 45, 48	ColorObsessed.com	
Viega	95	viega.us/About-us	
Visa Lighting	167	visalighting.com/products/cosmo	
Vitro Architectural Glass (formerly PPG Glass)	8-9	vitroglazings.com/solarban	855.VTRO.GLS
VT Industries	49	VTDoors.com	800.827.1615 ext. 10512
Wausau Tile	108	TecturaDesigns.com	
Weather Shield Windows & Doors	42	weathershield.com	
Zurn	90	ZURN.COM/sundara	855.ONE.ZURN

** issue mailed in regional editions. Publisher not liable for errors or omissions.*

MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE
MAKE MAKE MAKE

CHICAGO ARCHITECTURE BIENNIAL

9.16.2017 – 1.07.2018 chicagoarchitecturebiennial.org

NEW NEW
NEW NEW
NEW NEW

HISTORY

51N4E
6a architects
Ábalos + Sentkiewicz and Armin Linke
Adamo-Faiden
addenda architects with Joachim Brohm and Moritz Küng
AGENdA - agencia de arquitectura
Aires Mateus
An Te Liu
Andrew Kovacs
Angela Deuber Architect
Ania Jaworska
Aranda\Lasch and Terrol Dew Johnson
Archi-Union Architects
architecten de vylder vinck taillieu
Architecture of the VII Day
Atelier Manferdini
AWP office for territorial reconfiguration
Bak Gordon Arquitectos
Barbas Lopes Arquitectos
Barkow Leibinger
Barozzi Veiga
Baukuh and Stefano Graziani
Besler & Sons LLC
BLESS
Brandlhuber+ and Christopher Roth
BUREAU SPECTACULAR
Cameron Wu
Caruso St John with Thomas Demand and Hélène Binet
Charlap Hyman & Herrero
Charles Waldheim with Office for Urbanization Harvard Graduate School of Design and Siena Scarff Design
Christ & Gantenbein
Christian Kerez
Daniel Everett
David Schalliol
Dellekamp Arquitectos
Design With Company
Diego Arraigada Arquitectos
Dogma
Dominique Perrault Architecture
DRDH Architects
Ensamble Studio
Éric Lapierre Architecture
Fake Industries Architectural Agonisms and Aixopluc
fala atelier
Filip Dujardin
Fiona Connor and Erin Besler
First Office
formlessfinder
Fosbury Architecture
Francois Perrin
Frida Escobedo
Gerard & Kelly
Go Hasegawa
HHF Architects
IIT College of Architecture + SANAA
Iñigo Manglano-Ovalle
J. MAYER H. und Partner, Architekten and Philip Ursprung
James Welling
Jesús Vassallo
Jorge Otero-Pailos
June14 Meyer-Grohbrügge & Chermayeff
junya.ishigami+associates
Karamuk * Kuo Architects
Katharina Gaenssler
Keith Krumwiede
Kéré Architecture
Khoury Levit Fong
Kuehn Malvezzi
LAN with Franck Boutté and project produced by Pavilion de l'Arsenal
l'AUC as l'AUC
Luca Galofaro
Luisa Lambri
Lütjens Padmanabhan Architekten
Machine Project
Made in
MAIO
MALL
Marianne Mueller
Marshall Brown
Matilde Cassani
MG&Co.
Michelle Chang
Monadnock
MOS
Norman Kelley
Nuno Brandão Costa with André Cepeda
OFFICE Kersten Geers David Van Severen with Peter Wächtler and Michael Van den Abeele
Pascal Flammer
Paul Andersen and Paul Preissner
Pezo von Ellrichshausen Arquitectos
Philipp Schaerer
Philippe Rahm architectes
Piovene Fabi and Giovanna Silva
Point Supreme
PRODUCTORA
REAL Foundation
Robert Somol
SADAR+VUGA
Sam Jacob Studio
SAMI-arquitectos and Paulo Catrica
Sauter von Moos
Scott Fortino
Sergison Bates
Serie Architects
SHINGO MASUDA + KATSUHISA OTSUBO Architects
SO-IL and Ana Prvački
Stan Allen Architect
Studio Anne Holtrop
Studio Gang
Studiomumbai
Sylvia Lavin with Erin Besler and Norman Kelley
T + E + A + M
Tatiana Bilbao Estudio
Tham & Videgård Arkitekter
The Empire with Ilaria Forti, Joseph Swerdlin, and Barbara Mondolo
The Living
The Los Angeles Design Group
Theaster Gates
Thomas Baecker Bettina Kraus
Tigerman McCurry Architects
Toshiko Mori Architect
UrbanLab
Urbanus
Veronika Kellndorfer
WELCOMEPROJECTS
WORKac
Zago Architecture
ZAO/Standardarchitecture

Editorial: A Fitting Memorial in Charlottesville

TEXT BY NED CRAMER

COURTESY HÖWELER + YOON

Faced with the terrible torch-lit images of white supremacists rallying in front of Thomas Jefferson's Rotunda at the University of Virginia (UVA) on Friday, Aug. 11, and the death of counterprotester Heather Heyer and injury of many others the following day, I can think of no more succinct architectural response than to share this rendering of the Memorial to Enslaved Laborers on the Charlottesville, Va., campus.

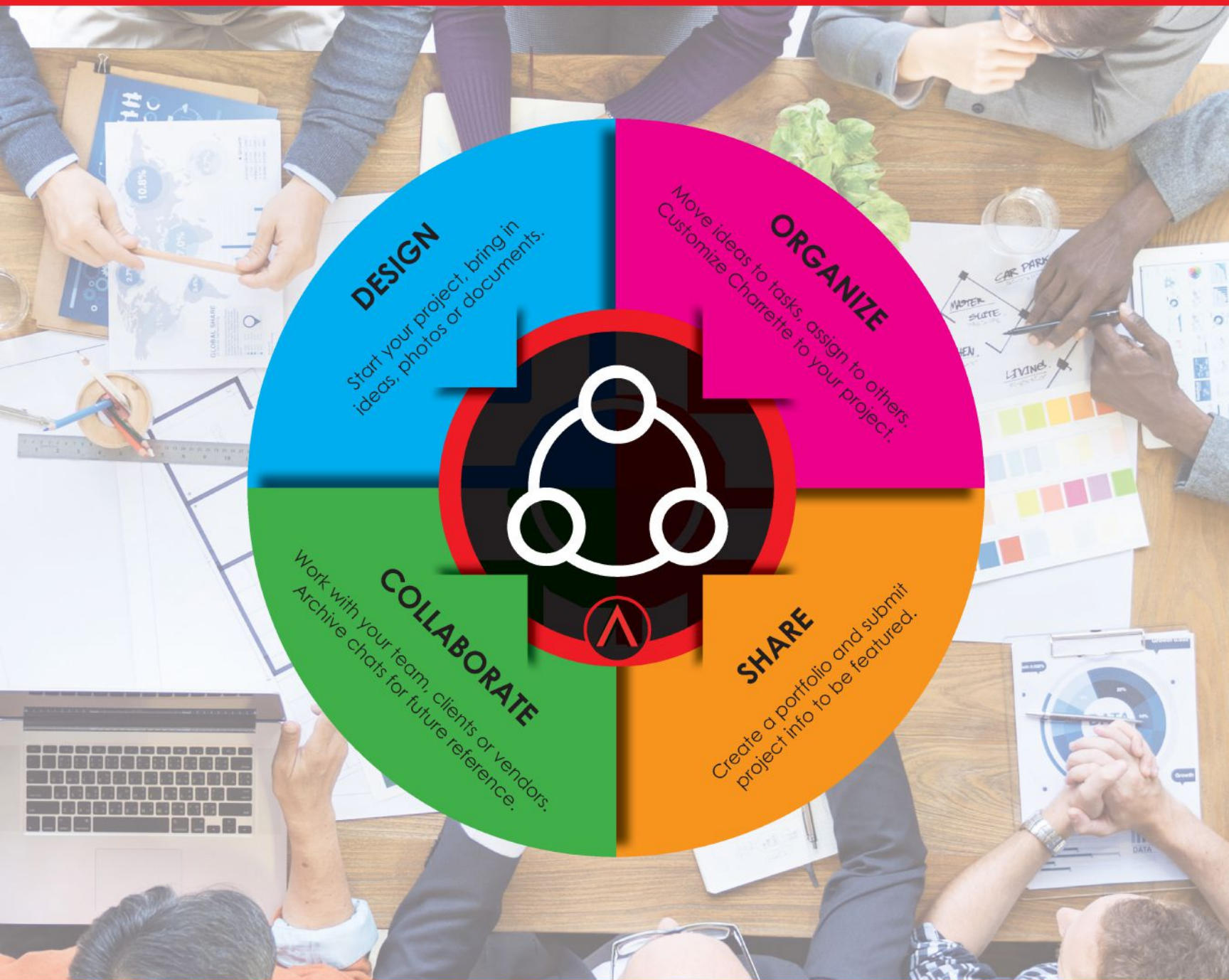
We must never forget: Black slaves—some 5,000 men, women, and children—built and maintained Jefferson's Academical Village, from the university's foundation in 1819 through the end of the Civil War. Jefferson himself owned slaves, and it was their forced labor that enabled him to become the principal author of the Declaration of Independence, America's third president, and the father of American architecture.

The Memorial to Enslaved Laborers was designed in a collaboration between Höweler + Yoon Architecture, Mabel O. Wilson of Studio &, Gregg Bleam Landscape Architect, and Frank Dukes, an environmentalist and founder of University & Community Action for Racial Equity at UVA. On June 9, the university's Board of Visitors Buildings and Grounds Committee approved the schematic design and placement on campus, in a green space within sight of the Rotunda.

The white supremacists claimed to be protesting the possible removal of a statue of Confederate general Robert E. Lee from a Charlottesville park. That their hate and violence occurred under such a pretext makes the construction of the Memorial to Enslaved Laborers even more essential, and fitting.

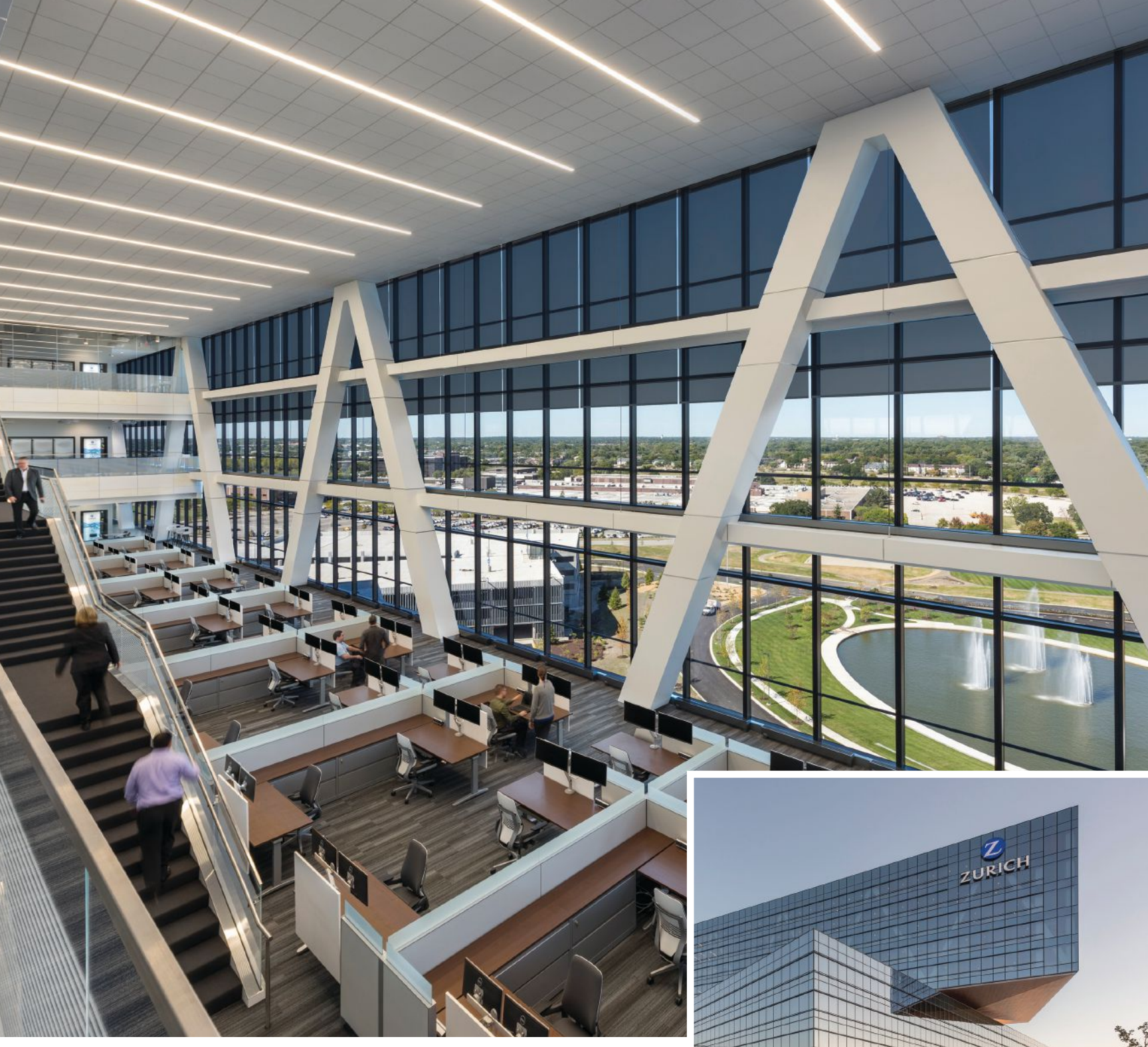
CHARRETTE

A NEW WAY TO DESIGN, ORGANIZE, COLLABORATE AND SHARE



ARCAT®

learn more at
www.arcat.com/charrette



Photos © James Steinkamp Photography

Shades by Lutron

Solar Adaptive Shades
Zurich Headquarters, Schaumburg, IL

LUTRON

lutron.com/shadesbylutron