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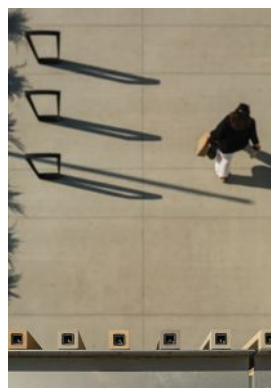
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ncramer@hanleywood.com  
@NedCramer

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gobrien@hanleywood.com

## Design

Editor  
Katie Gerfen  
kgerfen@hanleywood.com

## Features

Senior Editor  
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ewills@hanleywood.com

## Intern

Madeleine D'Angelo  
mdangelo@hanleywood.com

## Technology and Practice

Editor  
Wanda Lau  
wlau@hanleywood.com  
@wandawlau

## Senior Associate Editor

Katharine Keane  
kkeane@hanleywood.com

## Multimedia

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

## Art Director

Robb Ogle  
rogle@hanleywood.com

## Contributing Editors

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617.304.7297

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ssagadevan@hanleywood.com  
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773.824.2457

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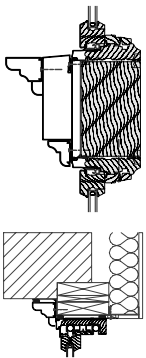
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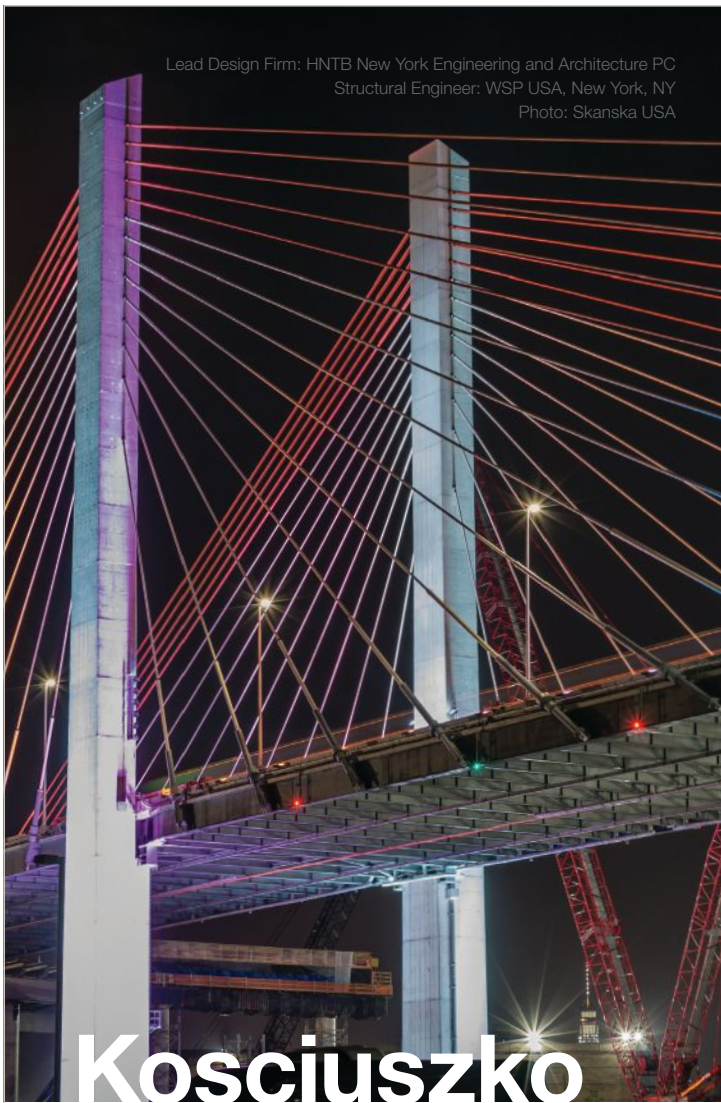
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# Kosciuszko à Gogo

The design of urban infrastructure affects city life as much as the design of its buildings. That's why replacing the **Kosciuszko Bridge**—a notorious pinch point in traffic between Brooklyn and Queens—was a high priority for Governor Cuomo. With heavy lifting from **HNTB**, **WSP USA**, and **Skanska**, a striking cable-stayed span has risen where the outdated bridge once stood, ensuring New Yorkers may still have trouble saying its name, but they never have trouble getting home. Read more about it in **Metals in Construction** online.

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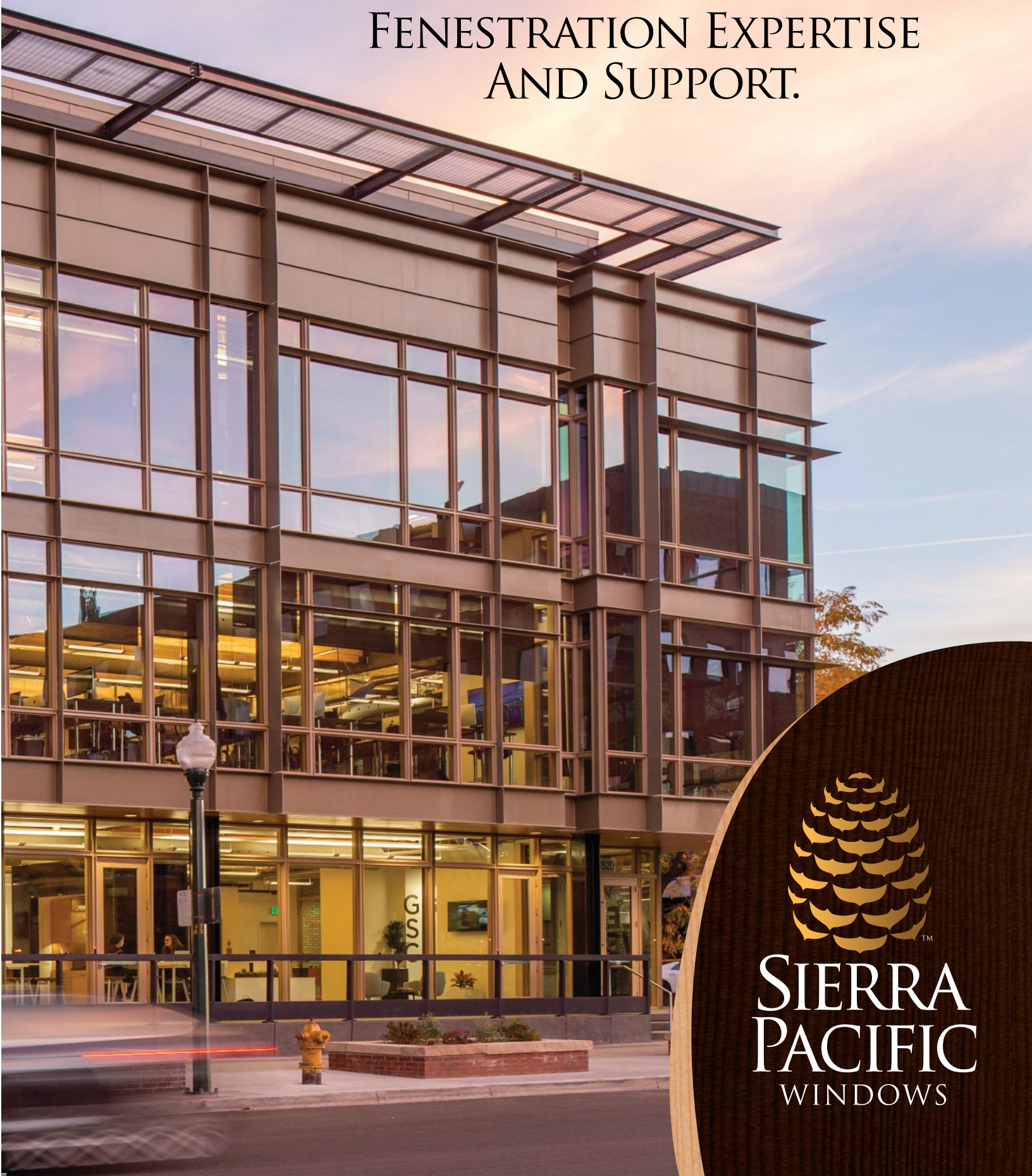


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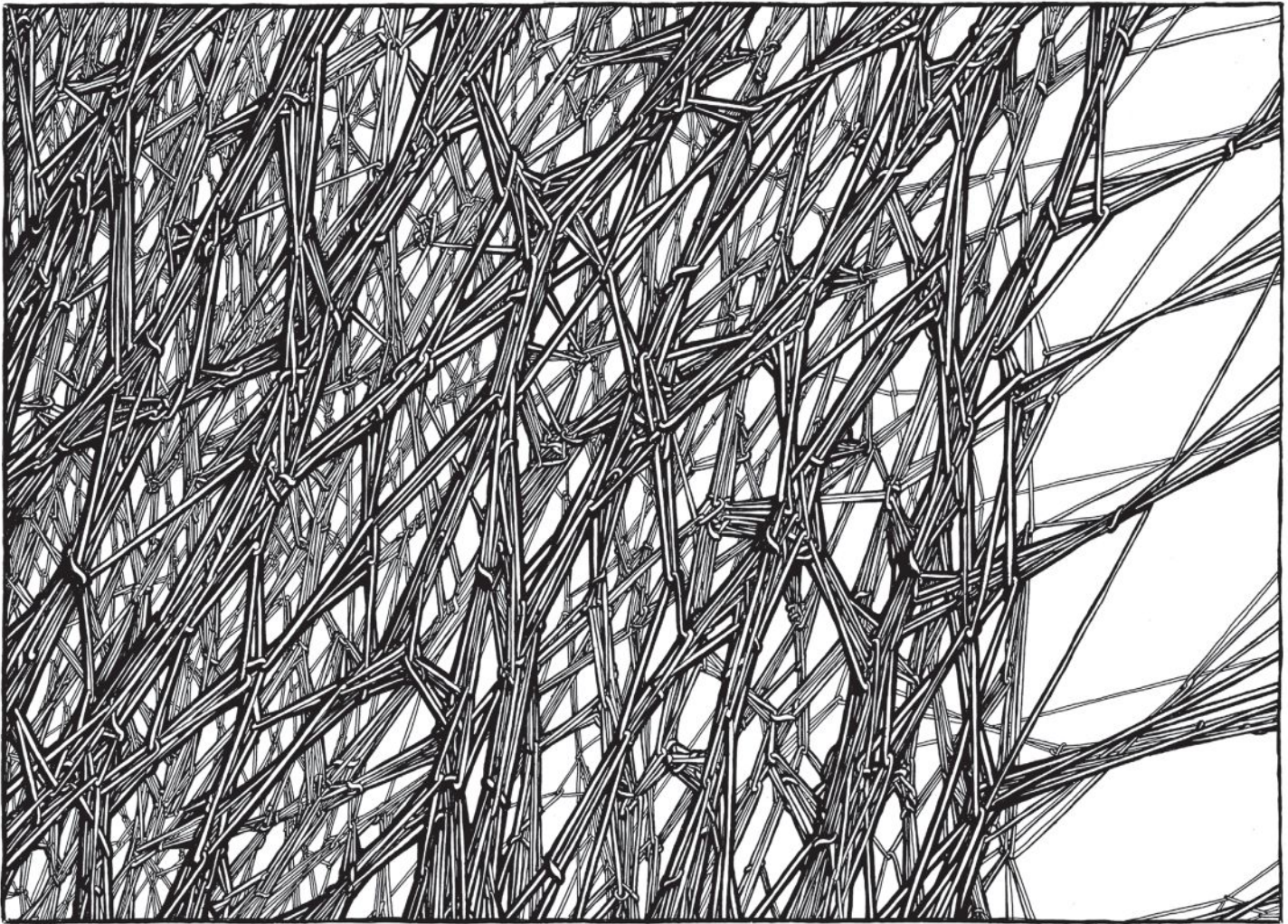


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### A Perspective on Perspective

I remain astonished that the debate about “hand” versus “computer” drawings rages on. One of my students recently accused me of trying to force him to make drawings “that don’t show the truth and are not how we see the world anymore.” Stunned, I retreated to my den to peruse with great pleasure Nalina Moses’s *Single-Handedly: Contemporary Architects Draw by Hand*, recently published by Princeton Architectural Press—but not before pointing out that computer renderings can lie with the best of them; and, by the way, just get over it and show me the design in a way that makes sense. —AARON BETSKY

DWAYNE OYLER

> To see Betsky’s full essay and drawings from *Single-Handedly* that are just as compelling as Dwayne Oyler’s (above), visit [bit.ly/draw-by-hand](http://bit.ly/draw-by-hand).





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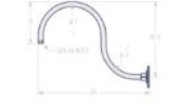


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### Healthy Designs

AIA and Academy of Architecture for Health (AAH) have named five projects as winners in the 2019 AIA/AAH Healthcare Design Awards: the Westlake Dermatology pavilion in Marble Falls, Texas, by Matt Fajkus Architecture (pictured); the GHESKIO Tuberculosis Hospital in Port-au-Prince, Haiti, by MASS Design Group; Casey House in Toronto by Hariri Pontarini Architects; the U.S. Department of Veterans Affairs Polytrauma and Blind Rehabilitation Center in Palo Alto, Calif., by SmithGroup and The Design Partnership; and Studio Dental II in San Francisco, by Montalba Architects. —MADELEINE D'ANGELO

> For additional information about the 2019 winners of the AIA/AAH Healthcare Design Awards, visit [bit.ly/2019-AIA-AAH-Awards](https://bit.ly/2019-AIA-AAH-Awards).





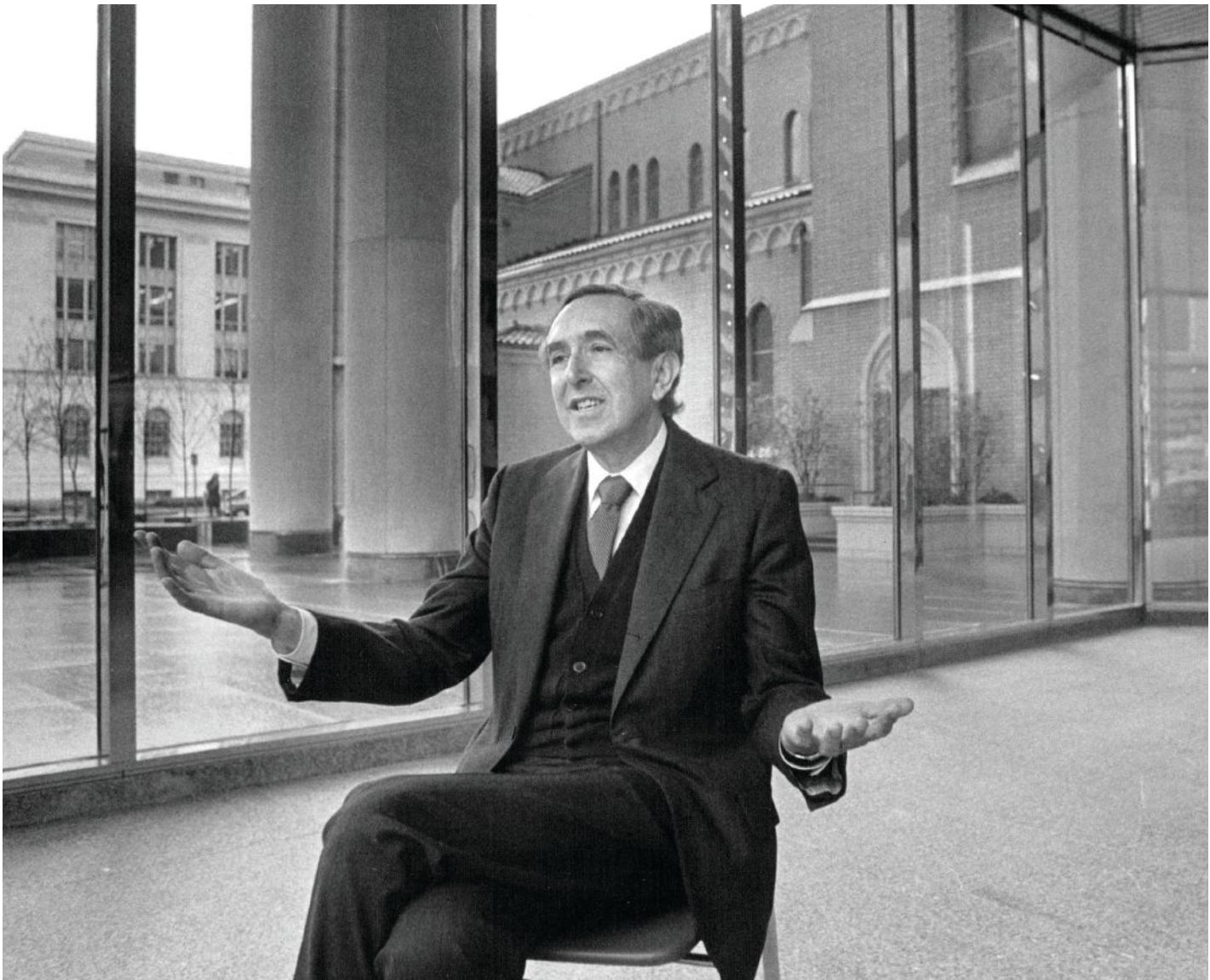
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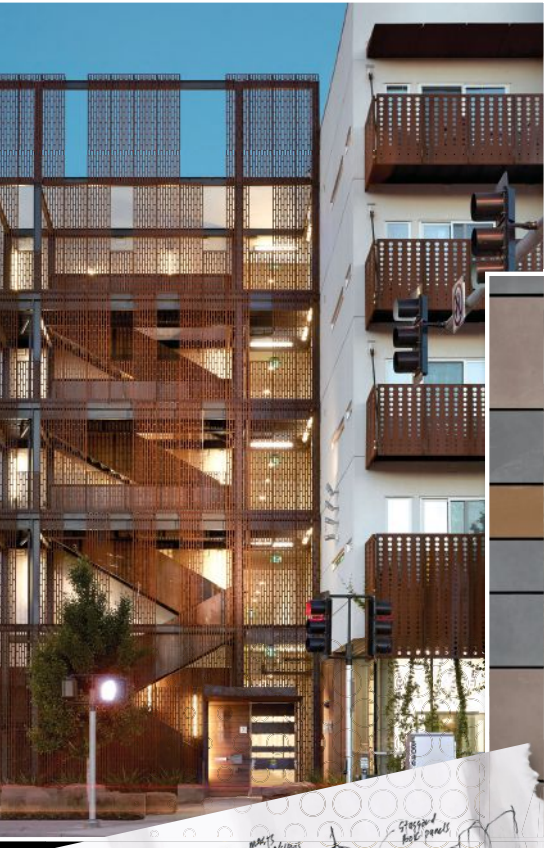
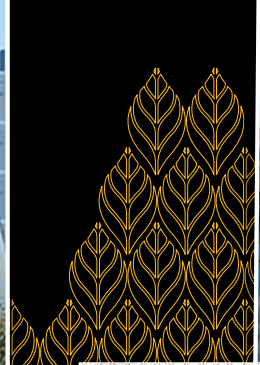
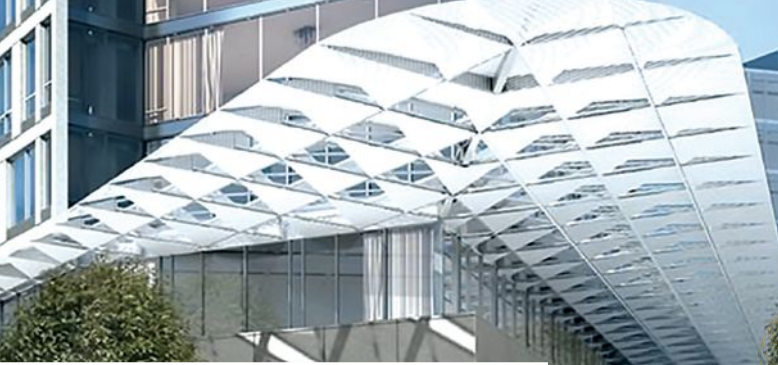


### Remembering César Pelli

César Pelli, FAIA, architect of the supertall Petronas Towers and numerous other iconic projects, has died at age 92. Born and educated in Argentina, he worked for Eero Saarinen before starting his own firm, now called Pelli Clarke Pelli Architects, in 1977. The same year, Pelli began his tenure as architecture dean at Yale University. "A master of both the urban scale and the carefully conceived individual detail," Robert Ivy, FAIA, says, "he leaves a legacy that stands as tall as the buildings he designed and as rich as the lives of the many architects whose careers were shaped by his generous teaching." —KATIE GERFEN

> To learn more about César Pelli's remarkable life and work, visit [bit.ly/cesar-pelli-obituary](https://bit.ly/cesar-pelli-obituary).





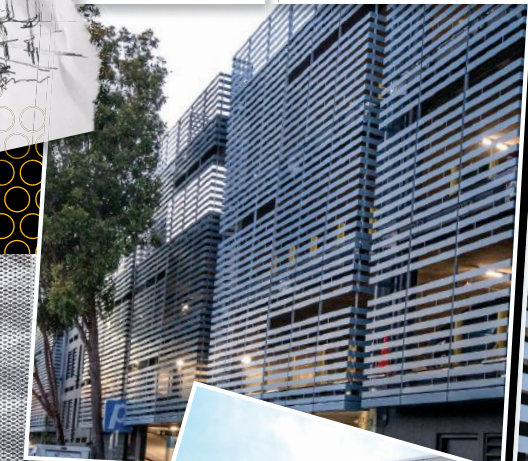
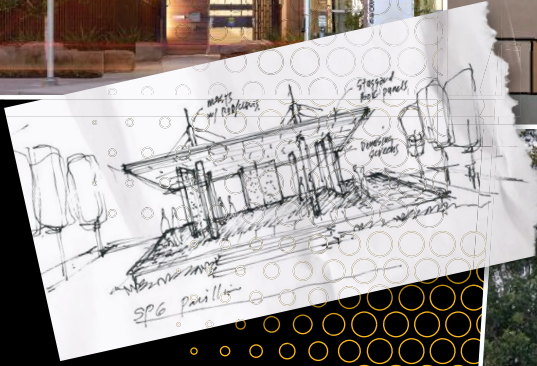
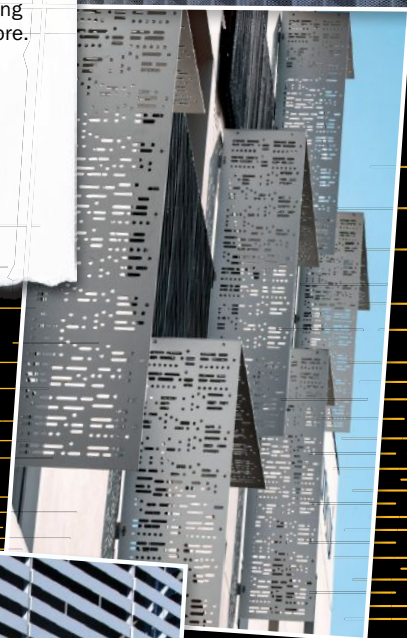
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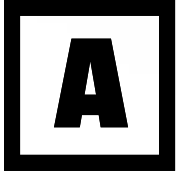
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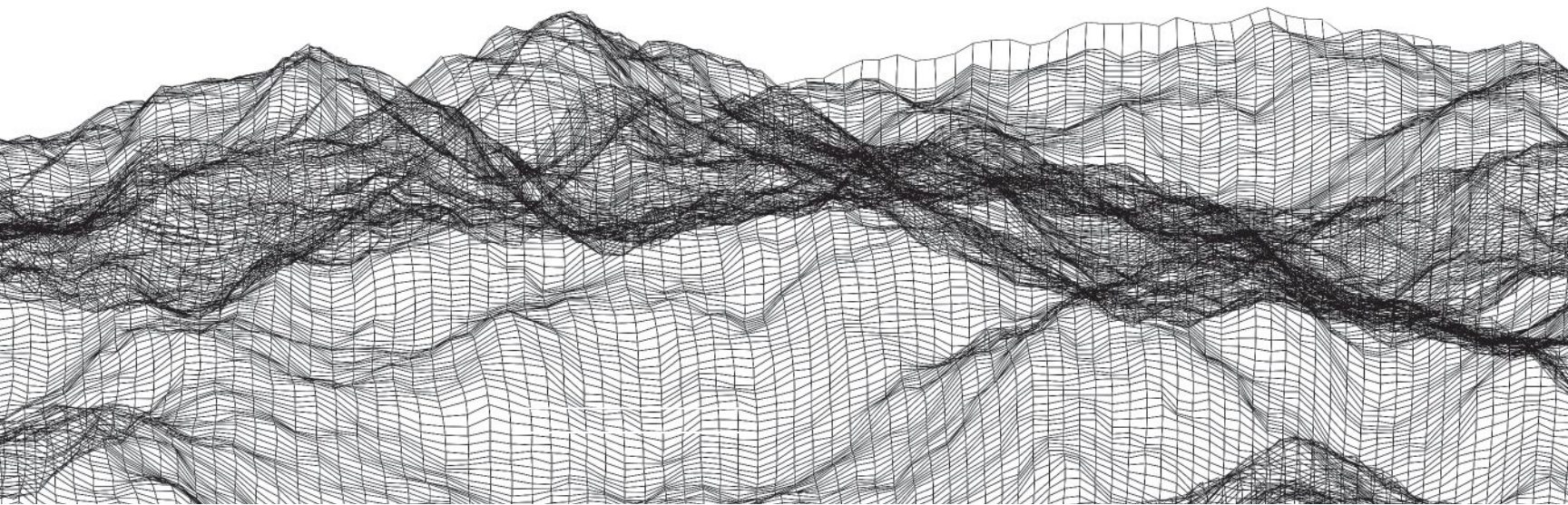


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# Best Practices: Fostering Community Engagement

TEXT BY AILEEN KWUN

Amid juggling the intricacies of design and code reviews, construction documentation, zoning requirements, and other bureaucracies, designers can lose sight of the simple premise that buildings are for people. Here, three professionals share challenges and tips on garnering meaningful community input in the design process.

## Listen, Listen, Listen

Finding a balance between a conventional architecture practice and the public sector can often feel at odds, says California College of the Arts diversity studies professor Shalini Agrawal. After practicing as an architect for 20 years, she felt “the traditional field was not addressing issues that were important to me, which was bringing community voices into the process.”

To help fill this void, last year, Agrawal spearheaded the launch of Pathways to Equity, a seven-month-long workshop program to prime designers with skills to practice responsive social impact design. In the program, Agrawal recommends “lead[ing] with deep listening, and not with solutions. Stakeholders bring different—and valuable—perspectives based on their own lived experiences that we, as outsiders, do not have.” Architects should understand that communities are often “the content experts with the issues that directly impact them, and should always have a seat at the table,” she continues. “Those who are closest to the issues are closest to the solutions.”

## Be Realistic and Deliberate

Acting on an impulse to become more involved is the first step, but even the best-laid plans can fall short, especially if they happen during your off-work hours. “It’s about being realistic about what you can give so you can prevent burnout,” says Siboney Díaz-Sánchez, AIA, an associate at San Antonio, Texas-based Overland Partners, founding member and co-chair of AIA San Antonio’s Latinos in Architecture Committee, and a zoning commissioner.

Finding a cause that speaks to your passions and concerns is one thing, but if the prospect of a new time commitment isn’t realistic for your schedule, Díaz-Sánchez says you can pitch in other ways. Don’t get arrested by inaction or overwhelmed if you find yourself short on bandwidth: Listen in on conversations and pay it forward. If an excellent opportunity to work on a community-focused project comes up at a not-so-great time, recommend others that could be a good fit.

## Institute Firmwide Standards

While going the extra mile to engage communities can create a complex matrix of priorities and objectives, especially in private-sector projects, it is up to design firms to establish standards. To take actionable steps, Díaz-Sánchez says, firms should “formalize time for listening to communities within the project scope and contract. Challenge clients who do not see the value of community

outreach—because architecture affects everyone.” Planning for translators, selecting physically accessible locations, and providing advance notice for community meetings will help ensure your outreach efforts are not only realistic, but welcoming. Above all, listen and follow up with progress and updates to keep community members engaged and informed.

As the director of civic impact at New York-based design firm WXY, Traci Sanders is active throughout the

“Those who are closest to the issues are closest to the solutions.”

—Shalini Agrawal, founder, Pathways to Equity

conceptual development and design process to ensure that social and community engagement is prioritized throughout. Depending on the particular project’s scope and type, Sanders says, engagement strategies can include large-scale forums open to the public; presentations and group breakout sessions; going out into the community to survey people on the streets; meeting folks at community centers or church events; and using augmented and virtual reality visualizations of proposed designs to share updates.

“We want to create spaces that promote equity,” Sanders says. “We’re keeping that in our minds as we create the vision and narrative that you have to come back, double down, and commit.”



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# Detail: Profiles Perforated Metal Skin

TEXT BY TIMOTHY A. SCHULER

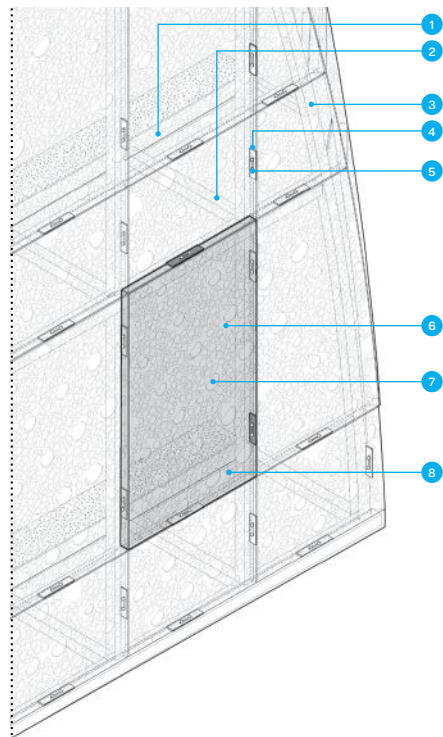
In Mexico City, a sculptural carbon-steel veil draped over the south and east façades of a six-story spec office building, dubbed Profiles, is the latest dynamic skin from Belzberg Architects that appears to defy its material properties. To craft the façades for the local developer Grupo Anima, the Santa Monica, Calif.-based firm worked with local steel fabricator El Roble and studied the site at length. "We situated ourselves on the sidewalk ... and asked, 'What is going to be the perception of this mass from the street?'" says Belzberg partner Brock DeSmit.



The resulting skin, which is 50% opaque, wraps the concrete-and-glass building and arches over a second-floor roof terrace to provide views out. Totalling 400 flat, curved, or double-curved steel panels, it covers a surface area of 6,865 square feet. While the panels' perforations were randomized using parametric design software, the designers created patterns by adding 13,000 carbon-steel "chads"—2.5-inch to 4-inch discs angling outward between 25 degrees and 75 degrees—that imbue a reflective quality throughout the day. Each chad was welded into place by hand.

Mock-ups built by El Roble were crucial to honing the gauge of the carbon steel, the maximum opening diameter, and the panel sizes. That the façade reads as a singular, diaphanous skin is testament to the team's attention to detail. The round perforations often intersect or span panel edges, which, despite adding another level of complexity to the fabrication process, was necessary to achieve the continuous look and feel of the façade. "We were trying to contain everything within each panel, but ultimately we realized that you could read that too much," DeSmit says.

Last December, the entire office flew to Mexico City for Grupo Anima's holiday party and experienced the finished project. "To wander through the building," DeSmit says, "and come across different moments that we spent so much time thinking about and anticipating is really awesome."



1. Continuous steel plate embedded in structural concrete slab
2. 76mm × 76mm × 3.2mm HSS outrigger welded to embedded steel plate
3. 76mm × 76mm × 3.2mm HSS frame
4. 3/16" steel plate welded to HSS tube
5. Ø16mm bolt
6. 6-gauge (5mm) carbon-steel panel, 3' wide by 4' to 8' tall
7. Ø2.5" to Ø4" carbon-steel chad welded to panel at 25° to 75° angle
8. Perforation



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## Call for entries **Deadline Extended**

### STANDARD ENTRY CATEGORIES (\$150)

1. Custom / Less Than 3,000 Square Feet
2. Custom / More Than 3,000 Square Feet
3. Renovation / Adaptive Reuse (residential remodeling and additions)
4. Restoration / Preservation
5. Multifamily Housing
6. Affordable Housing
7. Architectural Interiors (build-outs, interior renovations)
8. Student Housing
9. Outbuilding
10. On the Boards (any unbuilt residential project not yet completed)

### SPECIALTY ENTRY CATEGORIES (\$120)

11. Kitchen
12. Bath
13. Architectural Design Detail

### RECOGNITION

Winners will be featured in the December 2019 issue of ARCHITECT with expanded coverage online.

### ELIGIBILITY

Entries should be submitted by an architect or designer. Other building industry professionals may submit projects on behalf of an architect or designer. Projects outside the U.S. are welcomed. Any home or project completed after Jan. 1, 2015 is eligible.

### HOW TO ENTER

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[radesignawards.com](http://radesignawards.com)

### QUESTIONS?

EMAIL [rada@hanleywood.com](mailto:rada@hanleywood.com)

### DEADLINES

**REGULAR** September 6, 2019  
**EXTENDED** September 20, 2019 (Will include a late fee of \$50 / entry)

2018 AWARD WINNER EAST LAWRENCE SUSTAINABLE HOUSE BY STUDIO 804; PHOTO BY COREY GAFFER





## BEST OF BOTH WORLDS: FORMALDEHYDE-FREE AND LEED V4

Architects of high-stakes structures finally have a formaldehyde-free design path.

**Chapter 7 of the 2018 International Building Code** puts architects on the horns of a dilemma.

Compliance with *Fire and Smoke Protection Features* puts an architect at odds with LEED v4 Low Emitting Materials for schools, hospitals, and other high-stakes designs. Why? Formaldehyde, a Living Building Challenge Red List item, is present in the fire perimeter control materials required to achieve Chapter 7 compliance for perimeter joints and safing.

If only there was a formaldehyde-free way to manufacture mineral wool, the gold standard material for perimeter fire control. That idea has tantalized building material scientists for years: a mineral wool binding system that eliminates formaldehyde. Recently, one company discovered an alternative binding method that plays nice with *both* 2018 IBC Chapter 7 and LEED v4.

Their surprise announcement came in the early morning hours of Thursday, Oct. 25, 2018.

“It wasn’t an easy task,” recounts Angie Ogino, LEED AP, and Engineering Lead for Owens Corning Thermafiber group, the company behind the breakthrough. The 20-year industry veteran knows what the long-sought advance means to scores of project designers caught in the standards conflict.

“Life safety comes first. No other insulation material has proven its ability to contain a fire at the perimeter of the building like mineral wool. Now architects and specifiers finally have a formaldehyde-free solution without compromises. No LEED v4 documentation

worries. No Greenguard Gold documentation worries. No Red List worries. It’s one and done for a code-compliant, LEED-compliant exterior wall assembly,” Ogino says.

Ogino cites five other objectives that next-generation mineral wool achieves in high-stakes projects:

1. **When All Else Fails.** Mineral wool is part of a passive fire containment strategy that isn’t dependent on mechanical or electrical systems that can fail during a natural or man-made catastrophe.
2. **UL Certification.** “The new mineral wool formulation is UL certified. They provide independent verification that the new product meets the same strict fire performance standards as before,” Ogino explains.
3. **Sustainability.** The ICC-ES has certified the new mineral wool products. Thermafiber FireSpan and Safing are composed of a minimum 70 percent recycled content.
4. **Design Innovation and Flexibility.** “Every building is unique,” says Ogino. “With uniqueness comes different exterior façade considerations—the design, the geometry, the height of the spandrel. Our technical team has 45 years of test data as well as listed systems to assist with building design. This advisory service is available without cost to architects and has proven its value time and time again in high-stakes projects.”
5. **Reduced Liability.** Terrorism is a fact of modern life. To mitigate its impact on building design and construction, SAFETY Act designation by the U.S. Department of Homeland Security provides important legal liability protection when certain designated goods are used, like Owens Corning Thermafiber Fire Performance Products. “We are the only building material manufacturer that has been awarded SAFETY Act Designation,” says Ogino.

To learn more about formaldehyde-free commercial insulation solutions for interior and exterior wall design, without compromising performance, visit <https://www.owenscorning.com/formaldehyde-free>.

# Next Progressives: Low Design Office

EDITED BY KATHARINE KEANE

**Location:**

Austin, Texas, and Tema, Ghana

**Year founded:**

2006 (informally) while in grad school



**Firm leadership:**

Ryan Bollom, AIA, and DK Osseo-Asare

**Education:**

*Bollom:* B.S., Duke University; M.Arch., Harvard Graduate School of Design (GSD); *Osseo-Asare:* B.A., Harvard University; M.Arch., Harvard GSD

**Firm size:**

Three to five

**Mission:**

Our goal is to find and finesse an integrative systems approach to building—what we call “low design,” or realizing more with less. We believe that spaces shape well-being, that humans and ecologies perform best at low stress levels, and that optimizing efficiency with harmony can maximize the power of the built environment. Our buildings don't shout at you. We want our work to be like

that person you meet for the first time, but feel like you have known forever.

**Favorite project:**

One of our most challenging projects is the Agboglobloshie Makerspace Platform (AMP), which we co-initiated with Panurban, the French design consultancy led by Yasmine Abbas. AMP is a hybrid physical and digital open-maker architecture that emerged from a multi-year co-design process based out of the Agboglobloshie scrapyard in Accra, Ghana. It is a pan-African project to reimagine the future of design and architecture, but also of our relationships with products, waste and e-waste, and materials in the current age of consumerism.

**Origin of firm name:**

The inspiration for our name was based on the proposition that high art borrows from “the low,” an idea introduced by Peter Stallybrass and Allon White in their book, *The Politics and Poetics of Transgression* (Cornell University Press, 1986). They explain that transformative innovation in creative fields most often originates when the creator must overcome limited means and resources to provide meaning in their work. We prefer to work within this space.

**Memorable learning experience:**

This year, we were MoMA PS1 Young Architect Program finalists. While we didn't win, it was a very intense design process that reminded us of architecture

school, culminating in an epic final 36 sleepless hours that included the destruction of our hotel lobby, paralysis of the mind, “finishing” our model 30 minutes after we were supposed to arrive at PS1, then somehow delivering what we think was a powerful presentation.

**Design trend to leave behind:**

Instagram-able moments. Architecture must go beyond creating beautiful images, which should result instead from successful space-making. The best spaces offer unexpected moments and new interaction, and ultimately challenge us to engage with life, environment, and each other in different ways.

**Greatest career leap:**

We had already established our practice when we finished grad school in 2009, but our greatest leap happened during the Great Recession. We were tired and cold from the grind in Boston and needed to figure out what was next. DK wound up heading to the bush in Nigeria to design and build a new city while Ryan and his future wife took advantage of the recession and moved to Honolulu, where they waited tables on the beach during the day and worked on design projects at night. It turned out to be the perfect way to find the space and freedom to build an experimental practice.

**Best advice you've ever received:**

Find joy in the process; don't always focus on the end result.





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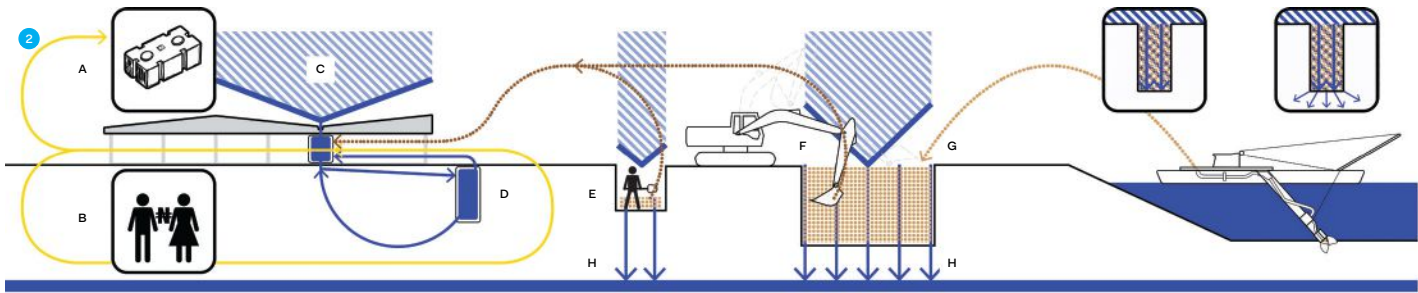
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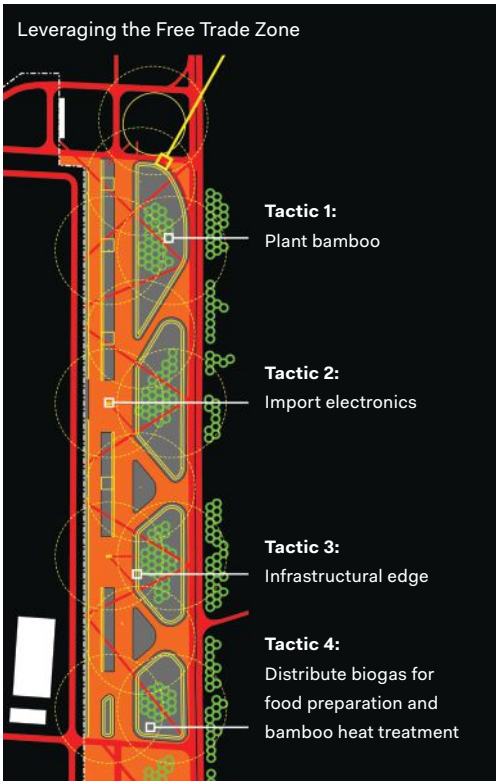
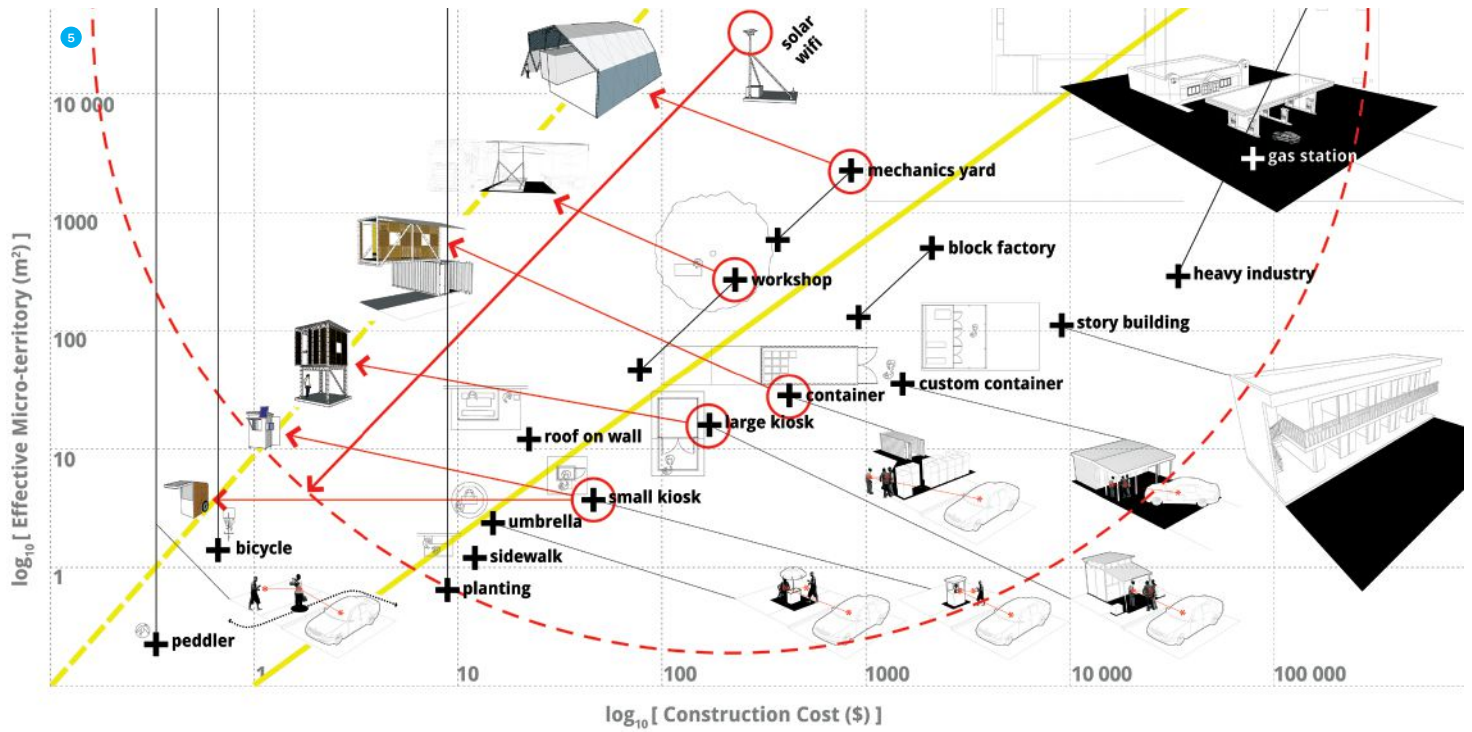
**Next Progressives:  
Low Design Office**



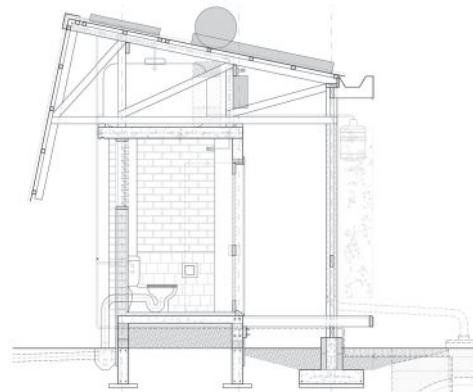
- A. Manually produced earth bricks
- B. Skills training and micro-enterprise
- C. Rooftop rainwater harvesting
- D. Water storage for brick production
- E. Hand-dug percolation pit for material (clay) sourcing
- F. Machine excavated quarry for new material (earth)
- G. Dredger-supplied sand from Ezichi River
- H. Sand filtration for groundwater recharge







Earth Brick Public Restroom Prototype



1. For its MoMA PS1 finalist submission, Low Design Office proposed modular bamboo elements that range in size from architectural components to furniture in order to encourage “interspecies interaction with the city and one another.” 2. For this concept city in Anambra State, Nigeria, the firm calls for sustainably sourced materials, including earth blocks made of locally sourced sand and clay. 3. This 2,900-square-foot vacation residence in New Braunfels, Texas, is designed to accommodate a multigenerational family and leverage views of the nearby Guadalupe River. 4. Intended to encourage maker ecosystems across Africa, the mobile Agboghloshie Makerspace Platform provides infrastructure for those interested in upcycling waste into new products. 5. Low Design Office proposes leveraging the micro-enterprise kiosk culture in Ghana’s cities of Accra and Tema to kick-start the country’s stagnant building industry by promoting sustainable economic and ecological expansion. The firm highlights the use of structural bamboo as a potential strategy for “hacking” free trade areas occupied by kiosks.





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# Products: K-12 Design Gets a College Preview

TEXT BY LINDSEY M. ROBERTS

School design today is about the student, says Catherine Wolfe, a senior interior designer at Ashley McGraw Architects (AMA) in Syracuse, N.Y. "There has been an ongoing shift in the climate of education towards a more active and student-centered learning environment."

As a result, amenities once more common in higher education are making their way into K-12. "Whether public or private, schools are interested in having spaces that align with what students are going to experience in college," says Erik Kocher, AIA, design principal and partner at Hastings+Chivetta, in St. Louis, Mo.

Below are several products that designers across the country have found useful in upgrading educational environments to increase security measures, integrate learning laboratories, and provide classroom flexibility.



## Safety Is Number One

"[W]e're having to think about scary things as we build school spaces," such as specifying windows that can't be kicked in, says Michelle Carpenter, director of education and government at Shaw Contract, in Cartersville, Ga.

Erica Gaswirth, AIA, a senior associate at PBDW Architects, in New York City, recommends **School Guard Glass**, which can be encased in doors, windows, and curtain wall assemblies as single panes or thermopanes. The glass is not "exceedingly heavy or thick," she says, but it is as effective as, if not more than, bulletproof glass. "It's an added level of protection and security without having to go down that ballistics road."



## Makers Gonna Make

In spaces where carpet won't suffice, such as art studios, designers turn to durable, easy-to-clean finishes. "Most carpet manufacturers are coming out with luxury vinyl flooring," says Hastings+Chivetta interior designer Alyssa Jackson. **Interface's luxury vinyl tile** comes in wood grains, metallics, and linear patterns, and with an optional acoustical backing.

To help publicize maker spaces, architects are using floor-to-ceiling, butt-glazed window systems and visual treatments. Gaswirth often turns to Solyx, which makes decorative films in a range of patterns and graphics, including gradients and faux stained glass.

## Shifting Boundaries

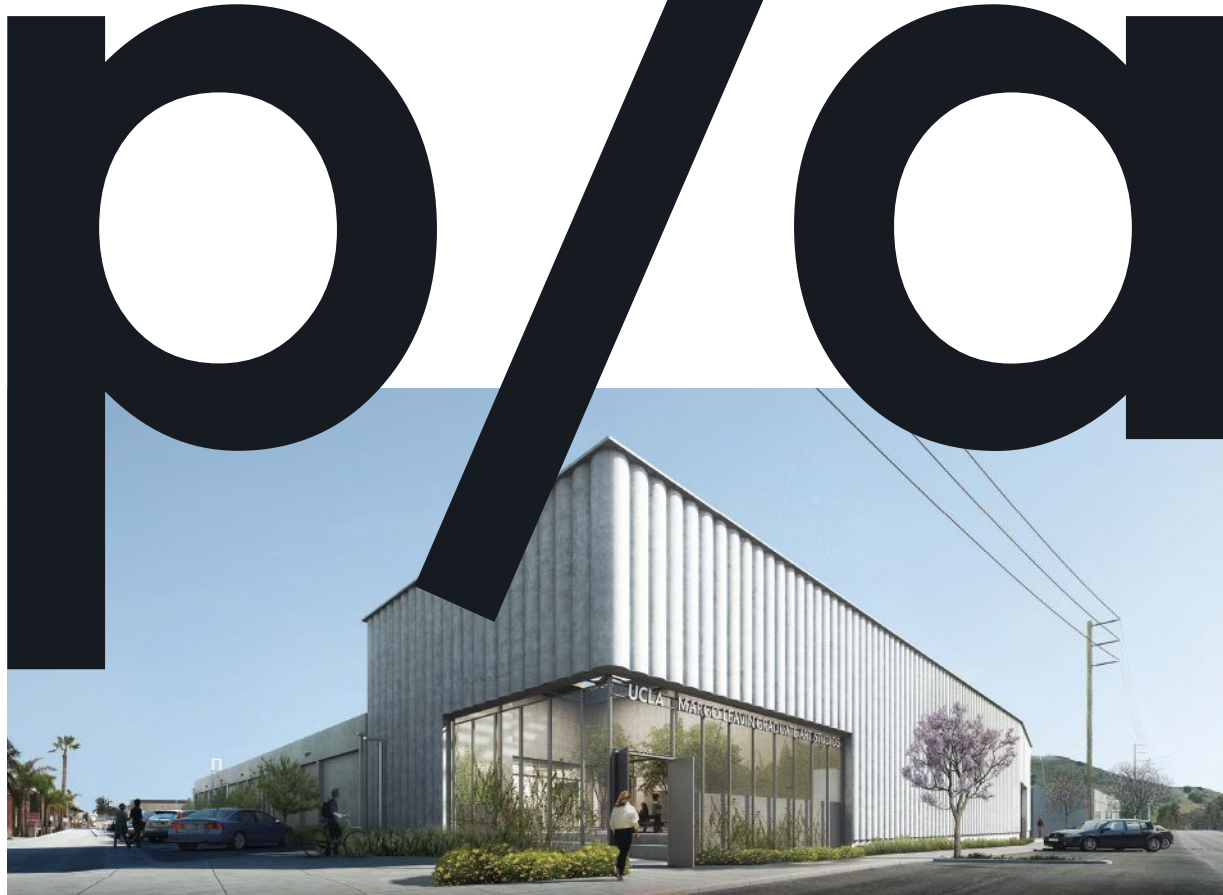
Flexibility in the physical parameters of classrooms is important because "spaces are blending into each other," Carpenter says. "We're even hearing the word 'classroom' less." PBDW project architect Thomas Faust has specified NanaWall HSW60, a sliding glass partition, between two laboratory spaces. If acoustical separation is a top priority, Faust suggests NanaWall's AcoustiFold, which can achieve a Sound Transmission Class rating up to 45.

Offering a range of spaces for educator breaks is important too, notes Taryn Kinney, AIA, a Houston-based principal at DLR Group. "Soft lounge furniture can easily partition space into different zones and levels of privacy." She likes OFS's Heya system, offered with noise-dampening felt and multiple add-ons, such as screen mounts and metal casters. Wolfe adds that AMA frequently specifies **KI's Pirouette table** and **Strive stacking chairs**; both the table and chairs can fold, roll, and nest for compact storage.



67<sup>th</sup> ANNUAL CALL FOR ENTRIES

# Progressive Architecture Awards



## ELIGIBILITY

Projects must have a client and a completion date after January 1, 2020. Judging will take place in November 2019. Winners will be notified in December 2019, published in the February 2020 issue of ARCHITECT, and honored at a ceremony in New York. For more information and rules and regulations, visit [paawards.com](http://paawards.com).

## RECOGNITION

Winners will be featured in the February 2020 print issue of ARCHITECT with expanded coverage online at [architectmagazine.com](http://architectmagazine.com).

## HOW TO ENTER

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## DEADLINES

**REGULAR** November 1, 2019  
**LATE** November 8, 2019

## FEES

**SINGLE ENTRY** \$195  
**ADDITIONAL ENTRIES** \$150  
**LATE FEE** \$50 (for entries submitted after Nov. 1)

2018 AWARD WINNER UCLA MARGO LEAVIN GRADUATE ART STUDIOS BY JOHNSTON MARKLEE

# Opinion: On Work and Workarounds

TEXT BY J. MEEJIN YOON, AIA



Franny and her female classmates are lying as still as possible inside the roof gutter. Gazing up at the sky in the lead-coated trough that hangs from the eave of White Hall, the women get the all-clear that the night guards have left. They sit up and crawl back into the architecture studio, return to their tables, and continue drafting alongside their male peers.

This would be a regular occurrence for Frances Schloss, who arrived at Cornell University in 1941 to study architecture. On the heels of the Great Depression and at the brink of the United States' entry into World War II, she and the women in her class were no strangers to hardship. At that time, Cornell was in session year-round to allow men to accelerate their degrees and quickly join the war effort. Franny, too, would finish her professional degree in three years and go off to draw battleships for the Navy.

However, contemporary rules of social propriety landed unevenly on men and women. In a scene strikingly similar to architecture school today, students often worked late into the night to complete their assignments. Despite the intensified pace of the accelerated academic schedule, Cornell's curfew requiring first-year women to be in their

dorm rooms by 9 p.m. remained in place. Consequently, the women studying architecture had less time than the men to complete the same workload.

Meeting Franny, now 96, and hearing her story led me to reflect on how each generation identifies and responds in turn to inequity. Women in Franny's era found ways to bridge the gap between the expectations placed on architecture students and the constraints placed on them as female students. Franny, who holds nothing but good will toward her classmates and professors, felt she had been afforded every opportunity throughout her education and career. For her, hiding in the gutter was simply a necessary "workaround" to pursue an education that she and her female peers felt fortunate to pursue. They did not set out to blaze trails; they simply wanted to be architects.

But the curfew was, in fact, an example of institutionalized bias—and one that disadvantaged women from the starting gate. Cornell would not lift the curfew until 1969, when the women's liberation movement in the U.S. propelled a rethinking of discrimination from a structural perspective and demanded that the increasing number of women attending university be given a fair chance at success.

Fifty years later, women now make up nearly half of architecture students. Substantial progress has been made to identify, address, and rid our institutions of discriminatory policies. And yet implicit bias, harassment, and

misogyny persist in the academy and the profession. Women remain less likely to complete licensure, receive equal pay for equal work, be promoted into positions of leadership, and start their own practices.

Many women are still forced to find their own workarounds—their own gutters—in order to succeed. These workarounds may enable some to achieve fulfilling careers; however, the talents and contributions of many others continue to go unrecognized, under-recognized, or at worst, unused.

At this momentous time when women hold significant leadership positions in architecture schools across the country, we have a responsibility and an opportunity to make the academy and the profession more just and equitable.

We need to keep current and future generations of women from needing to take on *both* the rigorous work our field demands *and* the workarounds that allow them to do it. No one today should need to hide in a gutter in order to pursue, endure, and flourish in an industry that needs them more than ever.

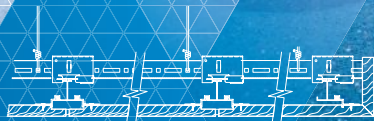
*J. Meejin Yoon, AIA, is the Gale and Ira Drukier dean of Cornell University's College of Architecture, Art, and Planning. Previously, she was a professor and the head of MIT's Department of Architecture.*

*She is also the co-founding principal of Höweler + Yoon Architecture, in Boston.*



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# Architectural Lighting: 2019 Light & Architecture Design Awards

EDITED BY WANDA LAU

DESCRIPTIONS BY MURRYE BERNARD, AIA

Lighting done well shields the complexities behind its astounding results. Now in its 16th year, the ARCHITECTURAL LIGHTING Light & Architecture Design Awards continues its mission of showcasing compelling projects that exemplify masterful design, integration, and implementation; leverage advances in light source technology and controls to minimize energy usage; and uplift users and their surrounding communities. Of the 113 projects submitted worldwide to this year's program, the jury recognized nine in the categories of whole building lighting, exterior lighting, interior lighting, and exhibition lighting and temporary installations. "You couldn't just hit the mark on one or two things," said juror Rachel Fitzgerald. "You have to align all the parts and pieces to come out on top." Though many contenders demonstrated great execution, noted juror Rebecca Ho-Dion, "this group of nine were also memorable."

## JURY

**Rachel Fitzgerald**, senior lighting designer and associate, Stantec

**Rebecca Ho-Dion**, lighting design director, ALULA Lighting Design

**Dave McCarroll**, AIA, partner and chief financial officer, KGM Architectural Lighting

## Details

**Location:** St. Louis, Mo.  
**Client:** Gateway Arch Park Foundation  
**Architect:** Cooper Robertson, New York  
**Entry Architect:** James Carpenter Design Associates, New York  
**Associate Architect:** Trivers, St. Louis  
**Lighting Designer:** Tillotson Design Associates, New York  
**Landscape Architect:** Michael Van Valkenburgh, Brooklyn, N.Y.  
**Landscape Lighting Designer:** Randy Burkett Lighting Design, St. Louis  
**Project Size:** 90,000 square feet  
**Manufacturers:** Nanometer Lighting, Electrix, Zumtobel Lighting, USAI Lighting, Lighting Services Inc., ETC



## Outstanding Achievement, Whole Building Gateway Arch Museum and Visitor Center

Near the base of St. Louis's Gateway Arch lies another, lesser-known, Eero Saarinen creation: a visitor center and museum submerged below grade. An indirectly lit ceiling creates the impression of a lobby flooded with daylight. A range of color temperatures, from 2700K to 5500K, forms a gradient of cool white light at the glazed entrance to warmer white light at the lower, centralized floors. At dusk, small, louvered linear LED downlights integrated into the canopy mullions illuminate the main entrance.

*"Conditions vary throughout the project, yet the lighting integrates perfectly into the architecture." —Rebecca Ho-Dion*

SAM FENTRESS





Cell



Dirigo (shown)

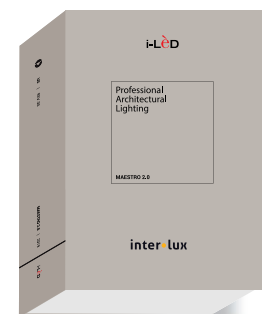


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## 2019 AL Light & Architecture Design Awards

### Details

**Location:** Antwerp, Belgium  
**Client:** City of Antwerp, Belgium  
**Lighting Designer:** Susanna Antico Lighting Design Studio, Milan, Italy  
**Project Size:** 387,500 square feet  
**Manufacturers:** We-ef, Schröder, Griven, Willy Meyer+Sohn



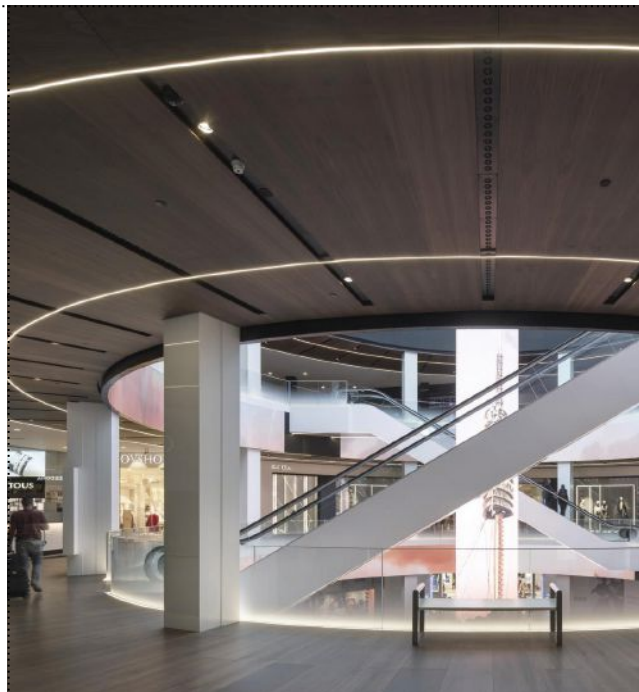
### Outstanding Achievement, Exterior Lighting Cathedral of Our Lady

Considered the most relevant and perfect expression of Brabantine Gothic style, the cathedral holds court on the Antwerp skyline from numerous vantage points. Linear LED floodlights integrated into the façade create drama at night. Architectural detailing is highlighted from grade upward with diffuse, wall-grazing light that becomes sharper and more descriptive upward to the spire. Cooler color temperatures at the higher elevations create a greater depth of field for the viewer. The entire installation—totaling 8 miles of cable and 675 luminaires—can be easily removed.

*"The lighting design fits the surrounding character and context, but yet has prominence and that wow factor."*  
 —Rachel Fitzgerald

### Details

**Location:** Barcelona, Spain  
**Client:** CBRE  
**Architect:** Francesc Rifé Studio, Barcelona  
**Architect of Record:** CC245 Arquitectos, Barcelona  
**Lighting Designer:** BMLD Designing with Light, Barcelona  
**Project Size:** 1.1 million square feet  
**Manufacturers:** AvantLED, Xicato, Lutron



### Outstanding Achievement, Interior Lighting Centro Comercial Diagonal Mar

Rectangular in plan, the mall's main axis consists of a long corridor punctuated by three rotundas. A glazed barrel vault runs the length of the third-floor corridor, allowing daylight to permeate all three retail floors. The lighting scheme emphasizes both the extensive glazing and the linearity of the space and plays with geometrical elements of the architecture. Linear LED lights with opal diffusers are integrated into ceiling edges, below escalators, and adjacent to handrails. A series of ethereal light installations accentuate the retail center, where natural and electric light coexist and complement each other.

*"The layering is organized, interesting, and still elegant."* —Rebecca Ho-Dion





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## 2019 AL Light & Architecture Design Awards

### Details

**Location:** New York City  
**Client:** RH  
**Architect:** Backen & Gillam Architects, Sausalito, Calif.  
**Architect of Record:** Wormser + Associates Architects, Brooklyn, N.Y.  
**Lighting Designer:** Sean O'Connor Lighting, Los Angeles  
**Project Size:** 90,000 square feet  
**Manufacturers:** Bega, B-K Lighting, Erco, SPJ Lighting, Acuity Brands Lighting/Winona Lighting, Acuity Brands Lighting/Hydrel, ConTech Lighting, Hunza, Linea Light Group, Lucifer Lighting, Lumenpulse, Spot on Lighting, LF Illumination, LumenWerx, Prudential Lighting, Topaz



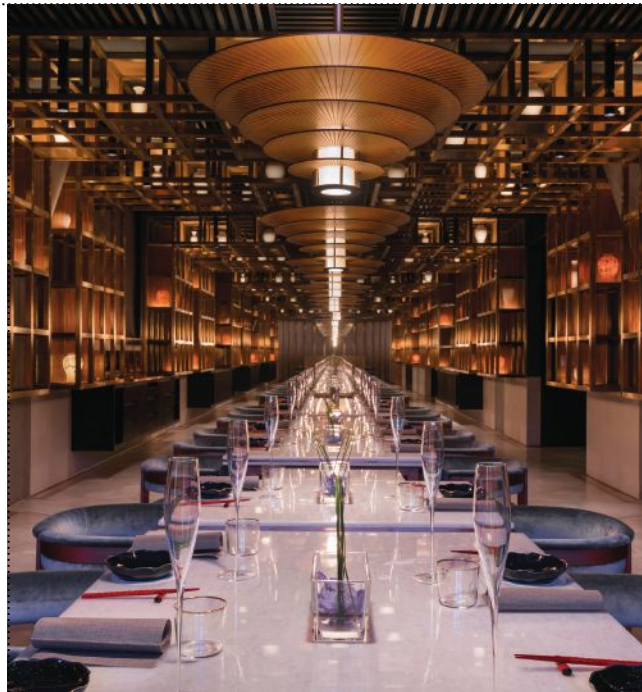
### Commendable Achievement, Whole Building RH New York

A former stable and garage was reimagined into a project that blurs the lines between residential, retail, and hospitality across six levels. An unconventional retail design approach uses fewer light sources while leveraging decorative lighting merchandise to create a sense of home within this massive space. Outside, LED uplighting animates the historic masonry façade. A centralized dimming system controls the interior and exterior lighting, cultivating grandeur and warmth. The lighting solution creates a cohesive composition where guests are enticed to interact with the unique spaces from afar or within.

*"It feels rich and textured, like a magical theater set, and that's not a bad thing."*  
 —Dave McCarroll

### Details

**Location:** Shanghai  
**Client:** Caesar Song  
**Architect:** MQ Studio, Shanghai  
**Lighting Designer:** The Flaming Beacon, Melbourne, Australia  
**Project Size:** 4,100 square feet  
**Manufacturers:** Acolyte, Reggiani Lighting USA, Gantom, MP Lighting, The Flaming Beacon, Ricardo Lighting



### Commendable Achievement, Interior Lighting The Peacock Room

From the lighting to its shelving, vases, and art, this restaurant was designed and detailed to pay homage to the historic Peacock Room by James McNeill Whistler. The lighting design uses warm color temperatures to create intimacy. Pops of monochromatic color—purple, red, and amber—throughout the evening via color-changing lights engage patrons. Focal points include cascading tiered-glass chandeliers in the dining areas, bespoke brass pendants, and illuminated brass shelving that highlights the minimalist white bone china on display.

*"The lighting creates a real sense of drama and intrigue. It's a place that I want to check out."* —Rachel Fitzgerald



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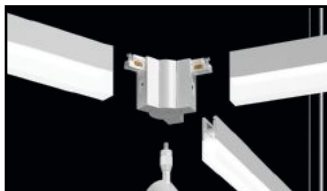


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## 2019 AL Light & Architecture Design Awards

### Details

**Location:** Berkeley, Calif.  
**Client:** City of Berkeley  
**Architect:** Marcy Wong Donn Logan Architects, Berkeley  
**Architect of Record:** International Parking Design, Oakland, Calif.  
**Lighting Designer:** Architecture & Light, San Francisco  
**Project Size:** 248,000 square feet  
**Manufacturers:** Ecosense, Acclaim Lighting, Erco, Philips Color Kinetics, Celestial Lighting, Acuity Brands Lighting/ Gotham



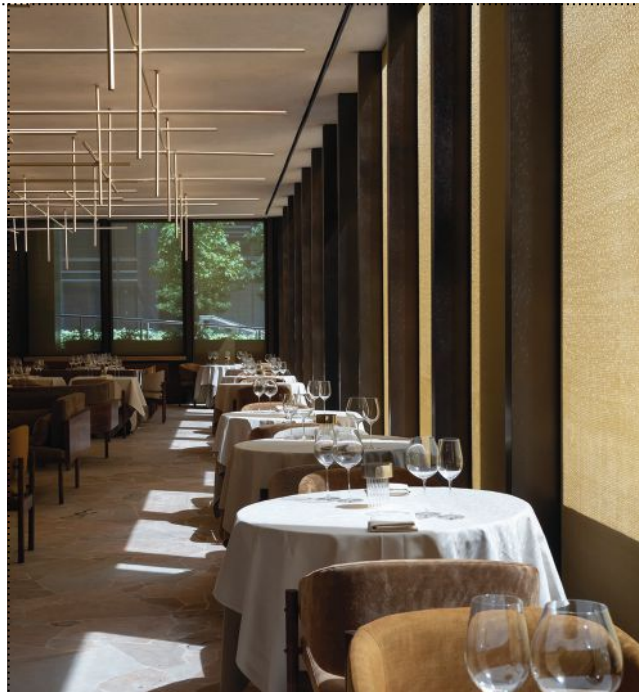
### Commendable Achievement, Exterior Lighting Center Street Parking Garage

To fit an eight-story, 720-car parking garage in Berkeley's downtown arts district, the design creates two sculptural façades using perforated steel panels, colorfully illuminated pleated metal walls, cantilevered stairwells, and carefully executed lighting. Color-changing LED floodlights illuminate the garage structure serving as the panel armature and backdrop, while the metal scrim of folded panels, in more than 20 different sizes, is front-lit with white LEDs. Sophisticated controls send rhythms of light dancing across the undulating façades. The design meets dark-sky constraints.

*"The design concept is strong and gives this generic space type a great identity."*  
 —Rachel Fitzgerald

### Details

**Location:** New York City  
**Client:** Four Seasons Restaurant  
**Architect:** Isay Weinfeld, São Paulo  
**Architect of Record:** Montroy DeMarco Architecture, New York  
**Lighting Designer:** Tillotson Design Associates, New York  
**Project Size:** 10,700 square feet  
**Manufacturers:** Flos USA/Lukas Lighting, Flos, USAI Lighting, Luminii, Electrix, Modà Light, Inter-lux, Apure, Lutron



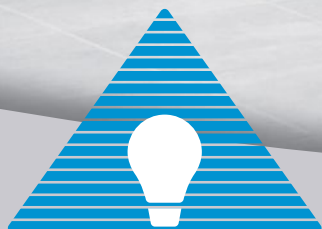
### Commendable Achievement, Interior Lighting Four Seasons Restaurant

The lighting design's primary objective for the new, though short-lived, restaurant location in New York was to create a high-end dining experience in which patrons look and feel beautiful. In the main dining room, a decorative installation of intersecting bronze tubes provides soft, indirect light while custom, battery-powered table lamps deliver flattering front lighting at an intimate scale. A bronze-clad tunnel punctuated by randomly placed miniature LED point lights connects the dining room and bar. Linear grazers recessed into the floor highlight hand-blown glass beads along the perimeter glazing.

*"Excellent use of integrated lighting and decorative lighting."* —Dave McCarroll



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## 2019 AL Light & Architecture Design Awards

### Details

**Location:** Jersey City, N.J.  
**Client:** Federal Home Loan Bank of New York  
**Architect/Interior Designer:** The Switzer Group, New York  
**Lighting Designer:** Lilker Lighting Group, New York  
**Project Size:** 52,000 square feet  
**Manufacturers:** 3G Lighting, Atelier Alain Ellouz, Axis Lighting, Bartco Lighting, BlackBody, Delray Lighting, Eaton, Ecosense, Electric Mirror, Eureka Lighting, Forum Lighting, Gubi, LaMar Lighting, Lucifer Lighting, Luminii, Matthew McCormick Studio, Nulux, Pinnacle Architectural Lighting, Roll & Hill, USAI Lighting, Vibia



### Commendable Achievement, Interior Lighting

#### Federal Home Loan Bank of New York, Jersey City Office

This office has been aesthetically reimaged as part of its transformation into the nerve center of 11 district banks and more than 8,000 member institutions. Emphasizing the well-being of occupants, the lighting design celebrates the interior architecture with motifs centered on organic shapes and the movement of water. Nearly 300 light-emitting polymer pendant elements arranged into a waveform greet guests in the elevator lobby. The café features undulating, white-lacquered wood ceiling fins with integrated lighting, a nod to the shifting waters of the Hudson River that the space overlooks.

*"The concept is well integrated, timeless, and also new." —Rebecca Ho-Dion*

### Details

**Location:** New York City  
**Client:** Madison Square Park Conservancy  
**Artist/Lighting Designer:** Erwin Redl, Long Island City, N.Y.  
**Project Size:** 20,000 square feet  
**Manufacturers:** Paramedia (fixture design), Fernekes Designs (engineering)



### Commendable Achievement, Exhibition Lighting and Temporary Installations

#### Whiteout

For an exhibition on the central Oval Lawn in New York's Madison Square Park, artist Erwin Redl created "Whiteout," on view from November 2017 to March 2018. The installation suspended 900 transparent white orbs from a 110-foot-wide by 180-foot-long grid of cabling and 12-foot-tall steel poles. Hovering 2 feet above grade, each sphere was equipped with a programmable white LED. A computer-generated wave animation augmented the orbs' kinetic movement from wind with virtual movement.

*"I love its simple elegance; I'd go see it just to understand it from the grand scale." —Dave McCarroll*



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# Residential: Salmela Architect

TEXT BY EDWARD KEEGAN, AIA

Located at one of the northmost points in Wisconsin, the hamlet of Cornucopia was named for its abundance of resources, which in the early 20th century included timber, fishing, and farming. Today, the local economy is driven by tourists and seasonal residents—including two semi-retired physicians from St. Paul, Minn., who bought a property on Lake Superior with the intent to restore its natural landscape. An earlier house and garage on the site had been demolished, and initially, the owners renovated a log sauna into a habitable cabin and added an outdoor privy. They later retained Duluth, Minn.-based David Salmela, FAIA, to design a more substantial, though still modest, complex.

Salmela has been churning out a remarkable body of work for decades, drawing on an affinity for natural materials, a deep interest in Scandinavian design precedents, and a profoundly nimble and quirky approach to form making. In Cornucopia, he designed a 1,368-square-foot single-family residence as the centerpiece of a complex that preserves the old cabin as a guesthouse. He also added two new pavilions (a garage and a workshop), which sit atop the hill and create a sense of entry between their simple volumes and direct visitors' perspective toward the main house and the lake. As for the privy, Salmela recast its role by moving it and wrapping it in a wood screen that provides privacy for a new outdoor shower.



The garage and workshop (top) and main house (above) are clad in black Richlite panels and are connected via a stepped pathway.

#### Project Credits

*Project:* Rothe Amundson house, Cornucopia, Wis.

*Client:* Gail Amundson and Peter Rothe

*Architect:* Salmela Architect, Duluth, Minn. · David Salmela, FAIA (principal, designer);

David Getty (project lead)

*Structural Engineer:* Meyer Borgman Johnson

*General Contractor:* Tworek Construction

*Size:* 1,368 square feet

*Cost:* \$436,593

> For more images of the Rothe Amundson house, visit [bit.ly/RotheAmundson](http://bit.ly/RotheAmundson).





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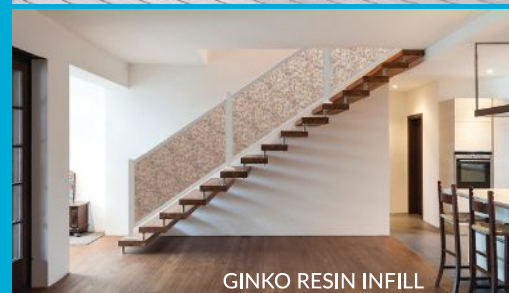
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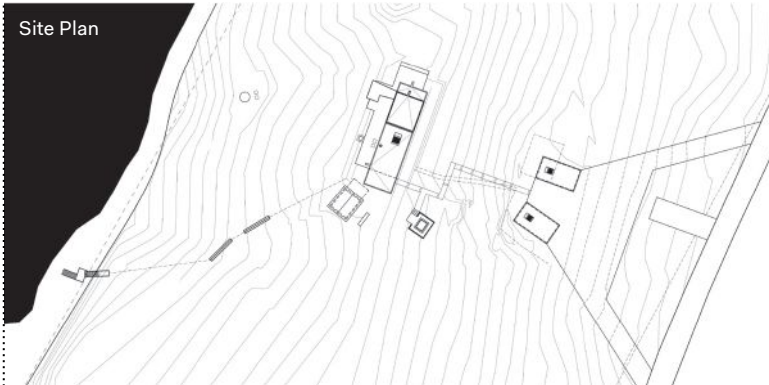


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**Residential:**  
**Salmela Architect**



The main house is a simple 18-foot-wide volume—a single story at the west end, and two stories at the eastern. From the mudroom entry under a broad 10-foot cantilever, visitors are enticed into the main space—shared living, dining, and kitchen—by a large divided-light window. A bath and guest bedroom complete the first floor, which opens to a broad cedar deck overlooking the lake. A bright red stair ascends to the master suite on the second floor where a door opens to an asymmetrical balcony that shelters a stone picnic table below.

Classically Modern design is never far from Salmela's mind. The second-floor balcony alludes to Alvar Aalto's Villa Mairea, a reference that Salmela claims he noticed afterward. The downspouts for the house's flat roof are a more intentional recall of Le Corbusier's sculptural concrete confections, albeit rendered in framed 2x cedar members.

Natural wood predominates, along with a restrained but precise use of color. Flush, horizontal tongue-and-groove interior walls contrast with the board-and-batten ceiling. Salmela-designed deck chairs face the lake and contrast with the black cladding of the main house and new outbuildings. The matte black is achieved with panels made from Richlite, an extremely durable paper-based material often used for skateboard ramps. "It's a unique material," Salmela says. "It's more expensive than other sidings, but it is maintenance free."

"Circumstances often force creativeness," Salmela says. And creativity is where he has always excelled. In Cornucopia, "the new isn't imitating the old, but there's an indescribable harmony between the stark modern and aged tradition," Salmela says. "And that is the mystery of architecture."

Second-Floor Plan



First-Floor Plan



The northwest façade has a deck that faces the lake and is outfitted with Salmela-designed chairs from Loll.



# Experience. Innovation.

## CASE STUDY

White Oak Medical Center | Montgomery County, Maryland

### BILCO Hatches Sit Atop New Maryland Hospital in 'Science Gateway'

The doors of the new Adventist HealthCare White Oak Medical Center will swing open in August 2019, bringing yet another key piece to a "Science Gateway" in the eastern section of Montgomery County, Maryland.

An integral part of the \$400 million facility is a central utility plant to house mechanical components. Atop the plant are four custom-made roof hatches manufactured by The BILCO Company that will allow workers to access the generators when they eventually need to be replaced.

The roof hatches are 9-feet by 22-feet and were installed by Cole Roofing. "This is the largest hatch I've ever been associated with," says Rick Brigham, who led the Cole installation team. "The BILCO hatches were the best choice for this job due to their ability to custom fabricate them to meet special size requirements."

BILCO's roof hatches are equipped with compression spring operators to provide smooth, one-hand operation regardless of size. They also include automatic hold-open arms to lock the covers in the open position to ensure safe egress, and are constructed with corrosion-resistant materials.

#### Large and unique hatches

CallisonRTKL served as the architect for the project and specified the hatches, according to Robb Macdonald of CBG South, the sales representative who recommended the hatches. "CallisonRTKL was impressed by BILCO's ability to engineer and fabricate hatches of such a large and unique size," Macdonald said.

"They considered the life span expectations of the generators and looked for a way to replace them down the road. The site's slope presented a challenge to the traditional way of removing large equipment through the sides of the building, so rooftop access was the best solution."

Set apart from the hospital, the two-story, 16,000 square foot central utility plant houses generators, boilers, water heaters and other components. Central utility plants (commonly called CUPs) are key to the infrastructure of any hospital, as they must last for the projected life span of the hospital campus. They also need to be expandable, adaptable and allow easy access to replace aging equipment.



Photos: LNJ Designs Photo

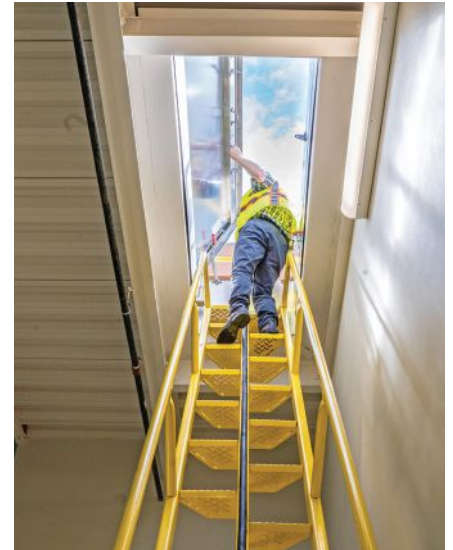
"Locating all of the generators, chillers, electrical switchgear, and hot water heaters separate from the hospital allows more future flexibility for the hospital and removes some of the more hazardous mechanical, electric and plumbing equipment from the hospital," said Ryan Dellinger, architect for CallisonRTKL.

#### Key Piece to the 'Gateway'

The plant includes four emergency generators, a cogeneration generator, four chillers, four boilers, ten hot water heaters, electrical panels and switchgear, and a small office for the building manager.

The hospital is a critical piece to the White Oak Science Gateway. The area includes 3,000 acres, including the new headquarters for the Food and Drug Administration, mixed-used projects, new public amenities, and the first rapid bus transit system in the state. The new hospital will replace Washington Adventist Hospital, which is located about six miles away in Takoma Park.

"This allows us to replace an aging building — a structure that, depending on which part of the building you're talking about, was built between 1950 and 1980 — and was suboptimal for modern health care," Hospital President Erik Wangsness said.



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**Residential:**  
**Salmela Architect**



*Above:* The main space on the first floor combines living, dining, and kitchen functions under a Velux skylight, and opens out to a cedar deck via Nordic Doors from H Window Co.

*Top:* The second-floor master suite has black slate tile floors and an aspen board-and-batten ceiling, and opens onto a cedar-lined balcony.





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# GLASS RAILING SYSTEMS

## CRITICAL CODE AND DESIGN CONSIDERATIONS

Presented by:



GRS Glass Railing System at the United States Courthouse in Los Angeles

### LEARNING OBJECTIVES

1. Obtain a working knowledge of typical glass railing designs and applications.
2. Understand proper installation processes, how to specify the correct system components and product types, and the difference between dry glazing and wet glazing.
3. Understand the role of the International Code Council and other industry code authorities like the IBC, IRC, and ADA.
4. Gain knowledge on trends in glass railing design—such as exposed edges and unitized systems—and how these new systems can be superior to current available options.
5. Learn how to utilize manufacturer resources to ensure project success, such as product specifications, drawings, and ICC-ESR reports.

### CONTINUING EDUCATION

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### GLASS RAILING SYSTEM TYPES

Architects looking for clean sightlines, more transparency, and an all-glass look will find many options in today's glass railing systems. Designed with safety and aesthetics in mind, glass railing systems help to open interior spaces and connect buildings with nature in exterior applications. They must be engineered to meet IBC code requirements, so safety is paramount. Regardless of whether the project is an outdoor balcony or an indoor switchback staircase, glass railings provide an attractive design solution for most any application. New developments in dry-glaze technology are reducing installation times and labor costs, and the rise of exposed edges and prefabricated unitized systems are making glass railing systems even more functional and sought after.

This article will introduce architects to common considerations for glass railing systems, including applications, installation best practices, and attachment methods. Glass types will be discussed as well as learning the difference between wet-glazed and dry-glazed systems. A thorough overview of applicable codes will be provided with a final review of industry trends driving glass railing system design and specification.

Diving right in, there are five standard types of glass railing systems. They are:

1. Frameless Base Shoe Systems
2. Stainless Steel Post Systems
3. Point-Supported Standoffs
4. Aluminum Railings
5. Post or Spigot Windscreens

Frameless base shoe systems will be the focus of this CEU course. Before exploring them in detail, it's important to also understand the other four glass railing system types and their cost so a solid comparison can be drawn between the core products and their features and benefits.

Stainless steel post systems have a budget between \$220–\$320 per linear foot and are commonly used in upper floor edges due to their robust construction. Point-supported standoffs have a budget of about \$140–\$160 per linear foot and are used predominantly in stairways because of their pronounced, contemporary look and function.

Aluminum railing systems are very common in the exterior of private residences and in



multifamily housing balconies. This system is sold knock down with some field fabrication required. Glass options for dry glazed lift and drop are 1/4-inch through 3/8-inch, and up to 1/2-inch glass can be wet-set. The linear foot price of an aluminum railing system can range from \$60–\$70.

Next, post or spigot windscreens are commonly used as pool enclosures or surrounding outdoor eating areas. They are offered in surface mount and core mount options. They typically have a low-profile to preserve outdoor views while protecting occupants from strong winds. Their cost varies widely depending on windscreen type and application.

The frameless base shoe system has a wide variety of residential and commercial applications, which will be explored next. These systems have typical costs between \$120–\$150 per linear foot. They can be wet-glazed or dry-glazed, and newer systems can be unitized.

### DESIGN CONSIDERATIONS FOR TYPICAL APPLICATIONS



A glass railing system in a typical balcony application.



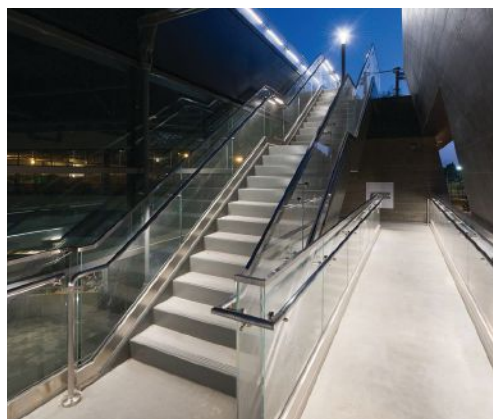
A glass railing system in a typical bridge application.



A glass railing system in a typical commercial terrace application.



A glass railing system in a typical floor edge application. A cap rail is often used to maximize load performance.



A glass railing system in a typical stairway application. Handrails are required per ADA standards.

Guardrails and handrails can improve the aesthetics of any project, but their appearance is secondary to the level of safety they provide. That's why it's important to determine whether the guardrail or handrail will perform properly. Not all glass railing systems and materials are suitable for each project specification and safety requirement. Understanding the difference

between products and when to use them is a critical design consideration.

Handrails are ideal for user guidance and support and are often used with post railing and frameless base shoe systems. The handrail grip portion can't be less than 1-1/4-inches or more than two inches in diameter. Handrails are typically installed on ramps and stairways.

Guardrails, on the other hand, are intended to prevent accidental falls off edges. This application is used where changes in elevation are greater than 30 inches on flat areas. Code for commercial projects requires the measurement from finished floor to the top of the guardrail to be no less than 42 inches. Application examples include balconies, bridges, and other areas where significant falls can occur. Be sure to consult the local code official if you are unsure whether a guardrail is required.

The choice of whether to specify a guardrail and/or handrail begins with understanding the type of project. The following sections are not an all-inclusive list; rather, an introduction to the various types of applications to consider. Guardrails for balconies, ramps, and floor openings will be discussed, as well as handrails for bridges and landings.

#### Balconies—Guardrails

To get the most out of available space on balconies, the fascia mount guardrail application is the best choice, which is why it's commonly used in areas where building square footage cost is at a premium. It creates approximately six inches of additional space per square foot by changing from a base mount to fascia mount installation method on concrete. This is equal to gaining an additional five square feet of usable space on a 10-foot long balcony.

#### Bridges—Handrails

Laminated tempered glass is a strong and necessary application for a bridge. It assists in lowering the deflection of the system and prevents glass from shattering and injuring pedestrians below. Embedding the base shoe into the surface will give the guardrail system a low-profile appearance. Utilizing two glass-mounted handrail brackets per lite of glass is the recommended method of attaching handrails to the glass. Installing brackets through the joints in the glass is not recommended as the brackets are prone to slip down when pressure is applied to the handrail.

When using a handrail system, make sure to check with the local code authority during planning. Some jurisdictions require a top rail according to 2012 IBC or earlier.

### Ramp Platform—Guardrail

When code requirements dictate a guardrail on a ramp platform, mount the base shoe to a steel angle two inches below the concrete slab edge. This gives the system a low-profile appearance. Designers should use laminated tempered glass.

### Floor Opening—Guardrail

Guardrails on floor openings maximize safety while simultaneously allowing daylight to be distributed deeper into a building. This application is typically used together with a skylight to increase natural light diffusion. Stainless steel base shoes, handrails, and cap rails will give a system like this a distinct look. When installing handrail brackets, avoid placing them between glass lites so the handrail stays firmly in place when applying pressure.

## STANDARD INSTALLATION METHODS



Some base shoes feature a multiple-hollow design that makes them 30% lighter.

Proper installation is critical to ensure safety and optimal appearance. Failure to follow manufacturer guidelines when installing glass railing systems can result in damaged glass and issues with the attachment of the base shoe to the substrate. The following sections will discuss attachment best practices to conventional types of substrates in order to avoid problematic and costly reworks.

### Attachment to Concrete

When attaching the base shoe to concrete, use a minimum thickness of five inches and compression strength of 4,000 psi or greater. Typical prep for a 10-foot stock length of base shoe is six inches off each end, with fasteners 12 inches off center and a minimum spacing between fasteners of six inches. In high wind applications, the spacing between fasteners may need to be decreased from 12 inches off center to six inches off center to compensate for the additional loads.

Anchor locations may be moved to avoid reinforcement such as re-bar, provided the same number of fasteners are used and no two fasteners are closer than six inches center to center. It is also recommended to mount the fasteners no closer than four inches to the slab edge. Popular component options for mounting the base shoe to concrete are 3/8 x 4-inch screw in anchor or M8 x 3-3/4-inch expansion anchor, which are common anchors when 1/2-inch and 9/16-inch glass is used. Thicker glass may require larger fasteners.

### Attachment to Weld Blocks

Welding the base shoe to a steel substrate is a popular option. Weld blocks should be 3/8-inches thick and the same width as the base shoe. They are typically installed 12 inches off center. They eliminate the need for drilling and taping on the job site, which saves valuable time.

One installation tip is to mount the weld blocks to the bottom of the base shoe using the appropriate fastener, then setting the base shoe in place and attaching a tack-weld on each

weld block, securing it to the steel. Once this is done, the base shoe can be removed from the weld blocks and the final 3/16-inch continuous fillet weld on the two opposite sides of the weld block can be completed by a certified welder. The base shoe can then be re-installed to the weld blocks.

### Attachment to Concrete Steel Substrate

Fascia or angle mount options include a socket head cap screw attached to a steel angle, base mount application, and screw-in type anchor or expansion anchor.

With the first option, drain blocks can be installed between the substrate and the base shoe for exterior applications where drainage is required. The base mount application is the method of attachment commonly used when a low-profile base shoe is selected. Finally, an alternative method involves either a screw-in type anchor or expansion anchor, as socket head machine cap screws cannot be used to mount to concrete.

### Additional Attachment Methods

If planning and time permits, a base shoe embedded into concrete is often preferred when an all-glass look is desired. This eliminates any base shoe showing and gives the impression that the glass comes directly out of the floor. The tapered base shoe was developed for this application and even though it may not be required, it is recommended to mechanically fasten the base shoe to the substrate.

Attaching the base shoe to an embedded steel strip is often used in multi-story buildings with concrete floors. The steel should be

## GLOSSARY

- 1. Glass Balustrade:** A framed or unframed glass barrier or guardrail.
- 2. Wet Glazing:** A method of setting glass that requires pouring expanding cement or applying structural silicone to secure the glass to the base shoe.
- 3. Dry Glazing:** A method of setting glass using taper sets in place of expanding cement.
- 4. Guardrail:** A barrier erected along the open edges of a floor, wall opening, ramp platform, runway, balcony, or other elevated area to guard against falling off the edge.
- 5. Handrail:** A narrow rail mounted parallel to a stair or landing that is used for grasping with the hand for support.
- 6. Lite:** A single pane or sheet of glass.
- 7. PVB:** A glass interlayer made of a tough, resilient plastic film used to bond glass lites together in the laminating process. Prevents tempered glass from shattering into small pieces.
- 8. Ionoplast:** A glass interlayer—superior to PVB offering a stronger, more deflective, and clearer plastic film. Used to bond glass lites together in the laminating process.
- 9. Laminated Tempered Glass:** An assembly of two or more lites of tempered glass bonded together with a PVB or Ionoplast layer.
- 10. Monolithic Tempered Glass:** A single lite of tempered glass.



pre-drilled to match hole locations in the base shoe. Installers using this method should drill a four-inch wide by 1/2-inch thick steel strip that is tapped for screws with 12-inch centers. The steel strip should be installed flush with the top of the concrete floor. To meet code requirements, weld 3/8-inch x 2 1/2-inch nelson studs to the underside of the steel strip on 18-inch centers.

Base shoes can be attached to wood, provided the glass railing is for an interior or a waterproofed exterior application. In this case, a 3/8 x 6-inch lag can be used that is six inches off center with a minimum five-inch embedment into solid blocking; however, the wood needs to have a specific gravity greater than 0.49 with a compressive strength perpendicular to the grain greater than 625 psi.

Drill eight wood screws, with four going vertically and four horizontally, into the joists. These angles are typically mounted 12 feet off center.

Next, we will discuss how glass types and thicknesses impact project specifications.



A correctly installed handrail system. Note that the brackets are not placed in between glass lites.

## QUIZ

- Which of the five standard glass railing systems is the most expensive per linear foot?
  - Frameless Base Shoe Systems
  - Stainless Steel Post Systems
  - Aluminum Railings
  - Post or Spigot Windscreens
- When attaching the base shoe to concrete, use a minimum thickness of \_\_\_ inches and compression strength of \_\_\_ PSI or greater.
  - five / 4,000
  - six / 4,000
  - five / 3,500
  - five / 3,000
- Base shoes can be attached to all of the following types of material except:
  - concrete
  - embedded steel strip
  - laminated
  - wood
- In a wet glaze installation, the minimum expanding cement compression strength must exceed 1,500 psi at 24 hours and \_\_\_ psi at 28 days.
  - 2,000
  - 3,000
  - 4,000
  - 5,000
- Removing glass lites in a dry glazing application is done by:
  - broken and chipped out of the pocket
  - pushing in the shim plates
  - breaking up the grout used to fill the voids between the glass and the base shoe
  - unfastening the tapers and lifting the glass out with vacuum cups
- According to IBC 2407.2, each handrail or guard section shall be supported by at least three glass balusters or shall be supported to remain in place should one baluster panel fail, EXCEPT when:
  - the glass balusters are laminated glass with two or more lites of equal thickness and the same glass type.
  - the glass balusters are laminated with two or more lites of varying thickness and the same glass type.
  - the glass balusters are laminated with two or more lites of equal thickness and varying glass type.
  - the glass balusters are laminated with three or more lites of equal thickness and the same glass type.
- All glass used in a handrail assembly or guardrail installation must be laminated tempered glass, except when:
  - there is no walking surface beneath
  - the walking surface is permanently protected from the risk of falling glass
  - Both a and b
  - None of the above
- Glass guardrail systems need to be able to support a distributed load of \_\_\_ pounds per linear foot applied horizontally at right angles in any direction to the handrail.
  - 40
  - 50
  - 60
  - 70
- According to Title 3 of the Americans with Disabilities Act, handrails are required on ramp runs with a rise greater than \_\_\_ inches and on certain stairways.
  - three
  - four
  - five
  - six
- The ideal edgework for exposed edge laminated glass railing systems is:
  - polished external arris
  - polished internal arris
  - polished double arris
  - seamed

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# DESIGN AND CONSTRUCTION OF TALLER WOOD BUILDINGS

Presented by:

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Mass timber's lighter weight boosted this Quebec-based multifamily project—dubbed Origine—by seven additional stories, giving it a total of thirteen. The same building in that location made from concrete would have maxed out at six stories high, given the low bearing capacity of the soil. PHOTO CREDIT: Stéphane Groleau ARCHITECT: Yvan Blouin Architect

## WHAT CONSTITUTES A TALLER BUILDING?

T3 in Minneapolis, Atlanta and Toronto. Trafalgar Place in London. 25 King in Brisbane. Brock Commons in Vancouver. These structures from around the world are all taller wood hybrid buildings constructed within the past five years. The Council on Tall Buildings and Urban Habitat (CTBUH) provides definitions for what constitutes “tall” around the globe. For the CTBUH, “tall” is subjective, as a high-rise in a small European town might get lost in a city like New York.

The CTBUH defines the materials from which tall buildings are comprised. Buildings constructed from timber are permitted through “the use of localized non-timber connections between timber elements” and in some cases a “floor system of concrete planks or concrete slab on top of timber beams” since timber still acts as the primary structure.<sup>7</sup>

In 2019, the International Code Council (ICC) announced approval of 14 code changes as part of the 2021 International Building Code (IBC) that will allow mass timber structures of up to 18 stories. Included in these approved code changes is the introduction of three new construction types—IV-A, IV-B and IV-C, with varying degrees of noncombustible protection required as follows:

- Type IV-A: 18 stories maximum, fully protected mass timber elements with fire-resistance ratings of 3 hours for bearing walls and structural frame construction, 2 hours for floor construction and 1.5 hours for roof construction.
- Type IV-B: 12 stories maximum, with protected exterior and limited exposed interior mass timber with fire-resistance ratings of 2 hours for bearing walls,

structural frame and floor construction and 1 hour for roof construction.

- Type IV-C: 9 stories maximum, protected exterior and exposed mass timber interior with fire-resistance ratings of 2 hours for bearing walls, structural frame and floor construction and 1 hour for roof construction.

Canadian code, too, has progressed to include taller mass timber structures. The new 2020 National Building Code of Canada (NBCC) will permit 12 stories of mass timber construction, taking into account its strength and fire resistance ratings.

Over the past several years, a number of tall wood projects have been completed around the world, demonstrating successful applications of new wood and mass timber technologies. With rising demand for new urban buildings, and

## LEARNING OBJECTIVES

1. Recognize that taller wood buildings (7–18 stories) can be safely, efficiently, and economically built using mass timber construction techniques
2. Discuss the different types of design approaches to mass timber construction for taller wood buildings.
3. Explain the similarities and differences between mass timber and lumber products that allow building professionals to design and construct taller wood buildings.
4. Distinguish the differences between design approaches to achieving the acceptable structural passive fire protection measures in a mass timber building.

## CONTINUING EDUCATION

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increased interest in sustainable and efficient construction, the potential for tall wood buildings is expected to grow.

### HOW TO BUILD TALLER WITH WOOD

Heavy timber, as defined by the American Wood Council, is either sawn lumber or structural glue-laminated timber and is associated with Type IV construction. While it was once primarily used for one-story structures such as churches, schools, auditoriums, or warehouses, heavy timber, like mass timber, is being used to build taller structures and

in innovative designs seeking to capture the aesthetics and benefits of building with wood.<sup>19</sup>

Mass timber is a product category typically characterized by the use of large, solid wood panels often manufactured off-site for wall, floor, and roof construction. Mass timber can include sawn lumber and structural glue-laminated timber. It also includes innovative forms of sculptural buildings and non-building structures formed from solid wood panel or framing systems. Products in the mass timber family include cross-laminated timber (CLT), dowel-laminated timber (DLT), glued-laminated

timber (glulam), laminated strand lumber (LSL), laminated veneer lumber (LVL), mass plywood panel (MPP), nail-laminated timber (NLT or nail-lam), and timber-concrete composites (TCC). Mass timber and engineered wood products can be used in an array of applications.

### TALLER WOOD STRUCTURAL SYSTEMS: UNDERSTANDING LOAD PATHS, TRANSFER, UPLIFT FORCES, AND DUCTILITY

Regardless of the materials used to build a structure, it must be able to manage loads and uplift forces. When building taller

### WHY BUILD TALLER WITH WOOD?

Design teams and building owners report a growing number of reasons why we should build taller with wood. In a survey report of tall wood buildings around the world, these reasons ranged from market leadership and design aesthetic to speed of construction and building performance.

- **Light-Weight Advantage and Efficient Footprints.** Timber structural systems have high building-volume-to-surface-area ratios, allowing for spacious interiors even with space constraints that typically require tall, compact designs. This means spacious interiors, even when the footprint of a building is constricted, which is frequently the case with tall, compact structures like high-rise buildings. Additionally, mass timber buildings weigh only one-fifth of traditional concrete buildings, which reduces foundation requirements. There is also opportunity for application of wood construction in projects to increase the height of existing buildings. The lighter weight of wood can allow additions to building height without foundation reinforcement that might be required if other building materials were used.<sup>8</sup>
- **Tight Envelopes and Thermal Performance.** Mass timber components are fabricated with high levels of precision to ensure a tight fit using Building Information Modeling (BIM) and CNC machining.<sup>9</sup> Together with wood's natural insulating properties, mass timber construction offers strong thermal performance, which is critical for high energy demands of tall buildings. For tall wood projects targeting net-zero energy or other stringent energy performance criteria, mass timber can store solar heat energy during the day and release it at night, reducing energy loads.<sup>10</sup>
- **Excellent Fire Resistance.** In the event of a fire, exposed surfaces of mass timber chars, protecting their inner structure, which is essential to occupant and first-responder safety in wood buildings, particularly those with multiple stories. This is reflected in the fact that the general liability insurance risks of a mass timber building versus a concrete or steel building are no different.<sup>11</sup>
- **Structural and Seismic Performance.** Wood's strength-to-weight ratio is competitive with steel, but it weighs considerably less, reducing



Mass timber products' light-weight advantage when compared to steel or concrete can often mean smaller foundations, helping to reduce a project's overall cost and seismic loads. T3 is 30% lighter than its equivalent in steel would have been, and 60% lighter than post-tensioned concrete according to engineer-led fabricator StructureCraft who supplied mass timber for the project | PHOTO CREDIT: Courtesy StructureCraft Builders DESIGN ARCHITECT: Michael Green Architecture (MGA) ARCHITECT OF RECORD: DLR Group

foundation loads and seismic forces and making for a resilient and safe structure. Extensive testing conducted by the Natural Hazards Research Infrastructure in 2017 validated "a seismic design methodology for 8 to 20 story tall wood buildings" that confirms "the structural integrity of the building both during and after an earthquake."<sup>12</sup> These attributes of taller wood are particularly beneficial for those in regions looking to build taller in earthquake zones. In some cases, a lighter weight structure not only saves on foundation costs but allows a taller structure to be built that would not be possible with concrete and steel in compromised soil conditions.<sup>13</sup>

- **Faster and Safer On-site Construction.** When it comes to taller wood, prefabricated sections can be manufactured off-site, shipped to the project and then assembled on site, significantly shortening project timelines and improving safety and accuracy. This means a lower number of workers on-site, more work being performed in controlled environments off-site, minimal cutting and coring on-site, and less temporary structures (formwork) being put in place on-site.<sup>14</sup>

- **Occupant Comfort and Well-being.** A plethora of research suggests that higher density, urban environments—and in particular high-rise structures—can be stress inducing.<sup>15</sup> With the growing interest in biophilic design and healthy buildings, architecture that makes use of taller wood structures offers promising results to counter such stress. Occupants of taller wood buildings have reported higher levels of comfort and satisfaction. And there is growing evidence that visual, tactile, and olfactory responses to natural materials, such as exposed timber, lower stress levels as measured by blood pressure, pulse rate, skin conductance, muscle tension, and electrical activity of the brain.<sup>16</sup>
- **Market Distinction and Overall Value.** Prefabricated mass timber building systems increasingly offer added value, including environmental benefits, cost/schedule savings, higher quality and more precise construction, and in some instances, better lease rates. In a feasibility study for a 12-story mass timber mixed use building in Seattle, Washington, using mass timber could lead to 0.5 % savings "below the cost of the concrete baseline"; it caused experts to predict that leases could potentially increase by 5%; the design attained "a 15% reduction of operational cost as compared to [the] baseline"; and, finally, the project is predicted "to emit 45% less greenhouse gases," from extraction through to construction, than a concrete structure. All of these benefits led the *Tall with Timber* report to state that building with mass timber creates "a new value proposition and business model."<sup>17</sup>
- **Build-up Sustainably.** Public policies on climate change and green building are increasingly calling for more sustainable ways to build up and increase density within urban environments, something taller wood construction is well suited to address. Governments, developers and clients are beginning to see the emerging economic advantages of mass timber design and construction due in part to a shift in manufacturing and supply chains and new code legislation that "now render engineered wood as cost competitive with more conventional types of construction such as concrete and steel."<sup>18</sup>

wood structures, it is especially important to understand the roles ductility and load transfer play in preventing structural damage.

Load paths, or the direction a load takes through structural elements, can cause those elements to experience compression, tension, bending, torsion, or shear. The components of a structure must be able to manage loads by ultimately transferring the loads to the ground. For tall wood buildings, the structural elements are particularly susceptible to shrinkage. Green and Taggart, in their book *Tall Wood Buildings: Design, Construction, and Performance*, recommend a design where the wood grain

is parallel to the load path to offset negative effects like shrinkage.<sup>20</sup>

Such a design can aid load transfer, creating consistency between the stories of a building. Other options include using stairs or elevator shafts to help transfer loads. Recent tests were conducted demonstrating that elevator shafts need not be made solely from concrete to achieve this; it is possible to have successful load transfer using a CLT core.<sup>21</sup>

Uplift forces, where external wind forces cause negative internal pressures within a building, in turn creating suction (uplift) forces—can also affect structures. Because wood structures

can be light-weight, they can be susceptible to uplift. Depending on the structure of the building, as well as local codes, strategies for coping with uplift vary. For example, options may include concrete floors or a concrete podium to serve as an anchor. In some cases, vertical mass timber panels of the service cores resist uplift forces.<sup>22</sup>

Ductility, “the ability of a material to deform under stress, thus absorbing and dissipating energy,” is crucial to managing uplift. According to Green and Taggart, when the “structural elements of a building are inherently rigid, it is the connections that must perform” the function of ductility. Connections are flexible enough to absorb and transfer wind, for instance, without becoming damaged. In the case of extreme weather, however, the connections will intentionally become damaged to prevent the failure of the structure as a whole.<sup>23</sup>

## GLOSSARY

**Cross-Laminated Timber (CLT)**—dimension lumber (typically three, five, seven, or customized layers) oriented at right angles to one another and then glued to form structural panels. Well-suited to floors, walls, and roofs, CLT can be used alone, with other wood products, or in hybrid or composite applications. CLT offers exceptional strength, dimensional stability, and rigidity and can be used in multistory and large building applications.

**Dowel-laminated Timber (DLT)**—common in Europe and is gaining traction in the U.S. for its ease of use with computer-controlled (CNC) machinery—such as lathes, routers and mills—and its all-wood composition. DLT is similar to nail-laminated timber (NLT). Instead of nails or screws, however, DLT uses wood dowels to join laminations. In application, DLT performs similarly to glulam and NLT. Because its grains run in one direction, DLT is well suited for flooring and roofing applications.

**Glue-Laminated Timber (Glulam)**—composed of individual wood laminations (dimension lumber), selected and positioned based on their performance characteristics, and then bonded together with moisture-resistant adhesives; the grain of all laminations runs parallel with the length of the member. Glulam is typically used as beams and columns; however, it can be used for floor or roof decking and is available in a range of appearance grades for both structural and architectural applications.

**Laminated Strand Lumber (LSL)**—an engineered wood product made from soft wood or wood strands pressure-bonded together using a water-resistant adhesive and then manufactured into consistent shapes that offer strength and ductility. It is commonly used for walls, floors, support beams, door cores, and sill plates.<sup>1</sup>

**Laminated Veneer Lumber (LVL)**—a type of structural composite lumber (SCL) that is made by “layering dried and graded wood veneers, strands or flakes with moisture resistant adhesive” into billets, which are then resawn into specific sizes.<sup>2</sup> Because it is an engineered wood product, it can be manufactured to meet various strength,

performance, and design standards. It is often used in applications such as headers, beams, rails, rim boards, and edge-forming material.<sup>3</sup>

**Heavy Timber**—a term used in code referring to either sawn lumber, CLT, structural composite lumber (SCL) or structural glued-laminated timber and is often associated with Type IV construction.

**Mass Plywood Panel (MPP)**—consists of several layers of wood veneer which are glued and pressed together, creating a large-format wood panel. Applications are similar to CLT and can be used in multistory and large building applications.<sup>4</sup>

**Mass Timber**—a product category typically characterized by the use of large, solid wood panels often manufactured off-site for wall, floor, and roof construction; includes sawn lumber and structural glued-laminated timber; includes structures formed from solid wood panel or framing systems. The IBC defines mass timber as structural elements of Type IV construction primarily of solid, built-up, panelized or engineered wood products that meet minimum cross section dimensions of Type IV construction.

**Nail-Laminated Strand Timber (NLT)**—individual dimension lumber, stacked on edge, and fastened using nails into a single structural element. Applications for NLT include flooring, decking, roofing and walls, as well as elevator and stair shafts.

**Parallel Strand Lumber (PSL)**—made from flaked wood strands longer than those used to create LSL; these strands are then formed into a large billet using a waterproof adhesive and are afterwards cured to create a uniform, engineered wood. It can be used in headers, beams, columns, and lintels.<sup>5</sup>

**Taller Wood**—while subjective and ever-evolving, taller wood buildings for the purposes of this course, will be considered structures greater than six stories, exceeding what the 2018 IBC allows.

**Timber-Concrete Composites (TCC)**—a hybrid material where timber and concrete are structurally connected. Connectors can be bespoke, proprietary, or created by drilling screws between the timber and concrete. TCC can be used for floor panels to reduce cross sections or to increase spans.<sup>6</sup>

## SELECTING A STRUCTURAL APPROACH

In addition to the stability and strength needed to account for load paths and uplift forces, the spatial arrangement of the building needs to be considered. The intended use of the building—commercial or residential—will be the first step in determining the structural approach. After that, the structural system will determine the architecture. Alternatively, the architectural strategy can be determined prior to the structural system; however, this has the potential to lead to higher costs and inefficiencies. A third strategy to employ when selecting a structural approach is a combination of the two aforementioned options. Assessing the attributes of the different systems while assessing other needs of the building can lead to a more refined strategy.<sup>24</sup>

### Platform.

Light-frame structural approaches are generally the most common type of wood construction in North America, and each type of light-frame construction is best suited for specific applications. For instance, platform construction, where individual floors are framed separately, is primarily used in residential applications. More specifically, platform framing involves load-carrying elements each one story in height, whether posts or panels; each floor forms a platform for the construction of the next.

### Balloon.

Balloon frames, on the other hand, involve vertical structural members that span at least two stories; the floor is hung off of a ledger connected to the



wall and forms a platform for the construction of the next floor. The columns are superimposed one above the other, with end grain-to-end grain bearing. As opposed to platform framing, balloon is often used in industrial or commercial applications. Light-frame construction can be combined with mass timber assemblies to form a hybrid building system suited for building taller midrise structures with wood.

### Massive Timber Bearing Wall Systems.

Massive timber panel systems are load bearing. Used in residential construction, massive panel systems are highly compartmented. This implies little need for future reconstruction, as well as adherence to local codes.<sup>25</sup>

### Post-and-Beam Systems.

As opposed to massive timber panel systems, post-and-beam systems are used in commercial applications. Post-and-beam systems require fewer structural joints, allow for open floor plans, and require no load-bearing walls.

### Hybrid Systems.

Hybrid systems can utilize wood, steel, and concrete to capitalize on their various performance properties. These systems are often employed in the creation of podium structures for mixed use buildings. As noted above, hybrid systems can also include a combination of light-frame wood and mass timber components.

**Choosing the Best Structural System for a Building's Function: Residential buildings will likely be more compartmented with bearing walls while commercial uses will call for more flexible, open floor plans, more easily achieved using a system of bearing posts connected by beams.**



This article continues on

<http://go.hw.net/AR092019-2>.

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## QUIZ

- Sawn lumber or structural glue-laminated timber that is associated with Type IV construction is \_\_\_\_\_. It was once primarily used for one-story structures such as churches, schools, auditoriums, or warehouses.
  - Mass Timber
  - Heavy Timber
  - Lightframe Wood Construction
  - All of the Above
- A product category typically characterized by the use of large, solid wood panels often manufactured off-site for wall, floor, and roof construction. \_\_\_\_\_ can include sawn lumber and structural glue-laminated timber.
  - Mass Timber
  - Heavy Timber
  - Lightframe Wood Construction
  - All of the Above
- Which of the following are reasons to build taller with wood?
  - Sustainability and Efficient Carbon Footprints
  - Tight Envelopes, Thermal Performance, and Excellent fire resistance
  - Structural and Seismic Performance; Safer On-Site Construction; Occupant Well-Being
  - All of the Above
- \_\_\_\_\_, where individual floors are framed separately, is primarily used in residential applications. This framing involves load-carrying elements each one story in height, whether posts or panels; each floor forms a platform for the construction of the next.
  - Platform
  - Balloon
  - Massive Timber Panel Systems
  - Post and Beam System
- \_\_\_\_\_ are load bearing and can be made from CLT. Used in residential construction, massive panel systems are highly compartmented. This implies little need for future reconstruction, as well as adherence to local codes.
  - Platform
  - Balloon
  - Massive Timber Panel Systems
  - Post and Beam System
- Which kind of wood chars on the outside, protecting its inner layers as well as driving moisture from the exterior of the wood to the interior?
  - Light Frame Wood Construction
  - Mass Timber, Heavy Timber, and Engineered Timber
  - Both A and B
  - None of the Above
- Five-layer CLT panels, when combined with layers of other material, have the potential to achieve STC ratings of up to \_\_\_\_\_.
  - 39
  - 24
  - 60
  - 59
- "\_\_\_\_ to \_\_\_\_\_ percent of global CO<sub>2</sub> emissions and 12 to 19 percent of global FF [fossil fuel] consumption by using 34 to 100 percent of the world's sustainable wood growth."
  - 1-5
  - 2-6
  - 3-30
  - 4-31
- Mass timber is capable of meeting up to \_\_\_\_\_ hours of fire resistance with and without gypsum protection.
  - 0
  - 1
  - 2
  - 3
- \_\_\_\_\_ consists of dimension lumber (typically three, five, or seven or customized layers) oriented at right angles to one another and then glued to form structural panels.
  - CLT
  - Glulam
  - LSL
  - LVL

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# AIA Architect

## AIA Voices



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## Putting Numbers to Work

**Compensation is the first step to making employees feel valued and recognized.**

Mancini Duffy Chief Financial Officer Bolanle Williams-Olley strives to create a supportive firm culture, predicated on fair compensation and valuing employees. She relies on her perspective as a Nigerian immigrant, nonprofit founder, and accounting professional, using numbers to tell a story about how being collaborative and inclusive is the best way forward for architecture firms. Williams-Olley is a speaker at this month's AIA Women's Leadership Summit, where she will share her thoughts on how architects can channel their potential for better opportunities and impact.

As told to Kathleen M. O'Donnell

Evaluating compensation always starts with a review of how we're charging clients for our projects: the primary source of firm finances. Project proposals have to stay market competitive. In some cases, firms find that they have to go in lower than budget. In my experience, I've seen the effect this has on cash flow into firms once projects are won, which in turn can affect how we compensate our employees.

The fact is good talent costs money. If you're not able to enrich an employee's full experience in your firm, you will suffer retention issues. This is why at Mancini Duffy, we considered a different approach: turning the question of compensation into an opportunity to see how else we could invest in our people's financial and long-term well-being. We offer flexible work hours and a vacation stipend; we match above-industry standards in our retirement savings plan; and, most importantly, we empower our people when it comes to creating and crafting their long-term career paths.

We understand the importance of compensating fairly, but beyond that we make

sure our employees are valued and recognized. That's [our] way, and I am proof of it. I'm a young black woman and part-owner of the firm. Most architectural firms don't have a leadership group that looks like ours; they're largely white, male, and over 50. At Mancini, what comes naturally to us is focusing on individuality, value, and skills—not race, not gender, not age. This is how we believe you move forward.

I am passionate about collaboration. At the end of the day we are all working towards a common goal. I want to ensure project managers don't see their accounting or human resources groups as separate entities. I integrate my team into the entire project life.

There are so many things you can learn from what your numbers are telling you. We truly see the different fluctuations and, even though we might not fully understand the technicalities, we are able to alert early enough on how projects are trending—positively or otherwise. I am always striving to see how we can be more proactive, rather than reactionary, through our numbers. **AIA**



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# AIANow

## A Firm Commitment

By Katherine Flynn

“Our firm is based on a fusion of design and performance,” says Kevin Sullivan, president of Boston-based firm Payette, which won AIA’s 2019 Architecture Firm Award. Payette has received accolades for its sustainable and innovative designs for some of the most energy-intensive building types: health care, science, and academic facilities. Powered by a firm culture of curiosity and inclusiveness, Payette continues to push the envelope in its work. Below, we highlight two Payette projects, both in progress in Massachusetts, that prioritize sustainability in the form of energy reductions and the presence of embedded nature in the health care environment.

### Beth Israel Deaconess Medical Center, Boston

A new inpatient building at Boston’s Beth Israel Deaconess Medical Center, scheduled to be completed in 2022, aims to put energy use 32% below the 2030 baseline while expanding the operations of an existing building on the medical campus. Chilled beams were identified early on in the design process as the best available energy-saving strategy, and their usage became one of the design drivers for the serrated façade that shades and tilts the glazing toward a north and south orientation, boosting the envelope performance.

A roof garden in between the existing Rosenberg Building and the new tower offers patients, families, and staff a view of Frederick Law Olmsted’s famed Emerald Necklace of parks, which also inspired the design of the building lobby.

### DCAMM Chelsea Soldiers’ Home Community Living Center, Chelsea

Perched on Powder Horn Hill in Chelsea, Mass., this long-term-care facility for veterans targets a goal of net-zero energy while making the most of natural light and panoramic views of Boston Harbor.

Payette’s net-zero goal was the driver for key design decisions. Geothermal heating and cooling, natural ventilation, a 0.5-megawatt rooftop-mounted solar array (which will hit state and federal fossil fuel reduction targets), a heat recovery system, a high-performance building envelope, and natural ventilation in all resident spaces allows for a building that eliminates the use of fossil fuels during typical operation.

The completion of the Community Living Center, slated for 2021, will herald the demolition of the nearby Quigley Building, enabling development of the full 7-acre site into an accessible landscape, and restoration of the adjacent Malone Park as a public amenity. **AIA**



Beth Israel Deaconess Medical Center, Boston



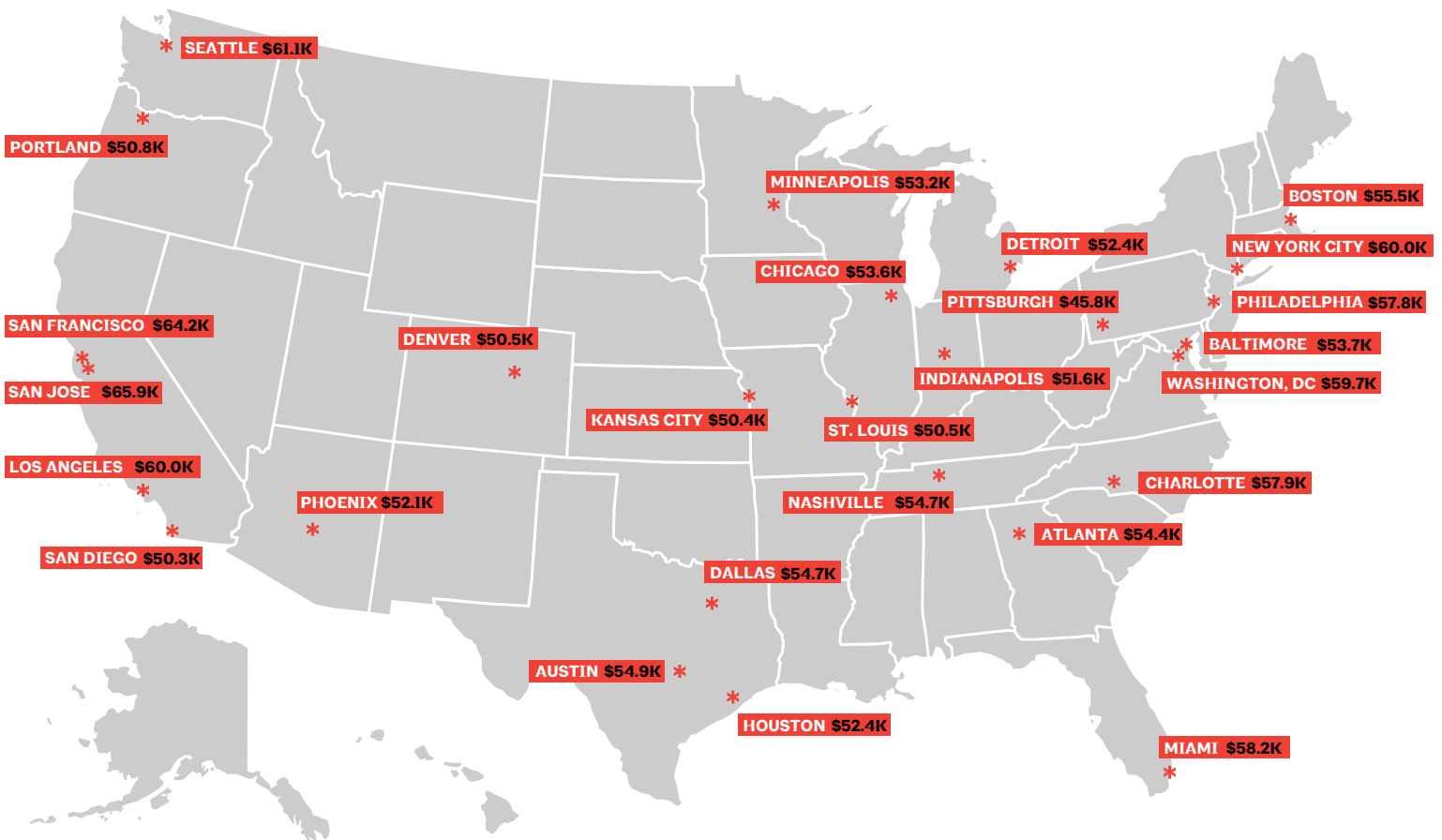
DCAMM Chelsea Soldiers’ Home Community Living Center, Chelsea

# AIA Feature

# A Surge in Architect Compensation

Firms across the U.S. are expanding their staffing to keep pace with an increase in nonresidential construction.

By Kermit Baker, HON. AIA, and Jennifer Riskus



National compensation trends for recent college graduates

Average compensation for a recent college graduate (non-licensed) in 27 metro areas. National average salary for a recent college graduate is \$55,800.



Like the broader design and construction industry, compensation levels for architecture positions tend to be volatile. Depending on construction market conditions, there can be periods of strong growth, followed by periods where architecture positions see no compensation increases, and potentially even declines.

The past few years have produced healthy increases in compensation across the profession. Spurred on by a record-long economic expansion, the national unemployment rate is near a 50-year low, and spending on nonresidential construction has increased 40% over the past seven years. As a result, U.S. architecture firms have been expanding their staffing. Payroll employment at firms has grown by an average of 7,500 positions a year over the past six years. The AIA estimates that approximately 4,500 of this average annual increase is for architectural positions. Given the retirement trends among aging architecture staff, architecture schools have not been able to generate enough new graduates to meet this expanded need for staffing in recent years. Therefore, firms have had to employ a range of strategies to attract new workers and retain their current employees, including:

- Increasing overall compensation levels across the profession.
- Relying more heavily on sign-on and retention bonuses to attract and retain staff.
- Increasing willingness to hire candidates without professional architecture degrees for architectural design and paraprofessional positions.
- Increasing training programs and productivity-enhancing technology investments in an effort to make their staff more productive.
- Increased benefits to staff when possible, while adding additional benefits that enhance the culture of the firm, help make it more employee-friendly, and generally promote greater levels of sustainability.

In addition to increased compensation and paid benefits to employees to attract and retain staff, many firms have increasingly relied on other benefits aimed at improving the work-life experience and enhancing the culture of the firm in the eyes of current and potential employees. For example, most firms offer

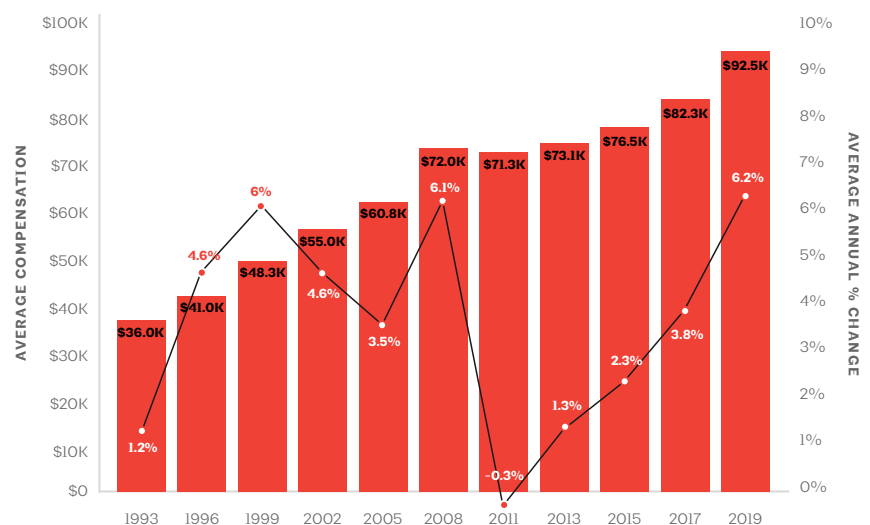
telecommuting and flex-time options, as well as casual dress options, while a growing number of firms are offering a child-friendly or pet-friendly office, shorter summer or seasonal hours, and paid time to volunteer.

### Compensation for Architecture Positions Nearing Record Growth Pace

Average total compensation across all architectural staff positions averaged in excess of \$92,000 at the beginning of 2019, up more than 6% per year from early 2017 levels, according to the recently released 2019 AIA Compensation Report. This pace of growth matches the strongest annual rate seen over the past two decades. However, it is a cautionary note that the last times architect compensation reached an increase of 6% per year—1999 and 2008—the economy and the construction sector were either starting to enter national economic downturns or were just about to do so.

While some of the growth in compensation merely offsets the pace of inflation in the cost of goods and services, average architectural compensation has seen substantial growth beyond mere inflation over the past two decades. In 1990, average architecture compensation was just over \$70,000 (in 2019 dollars), so real compensation for these positions has increased by almost a third over this two-decade period.

There continues to be wide variation in salaries between smaller firms and larger firms, but data from the 2019 report indicate that junior and entry-level positions had measurably lower variations in salaries across firm sizes. This is in contrast to managers and department heads, which had more than a 40% difference in average salaries for most positions in those categories, and a difference of more than 80% for some of the most senior-level positions. Many positions continued to see an increase in the share of their salary that is



Average annual compensation for architecture positions

Average annual compensation, weighted by number of positions, including project design, project management staff and recent college graduates.

# AIA Feature

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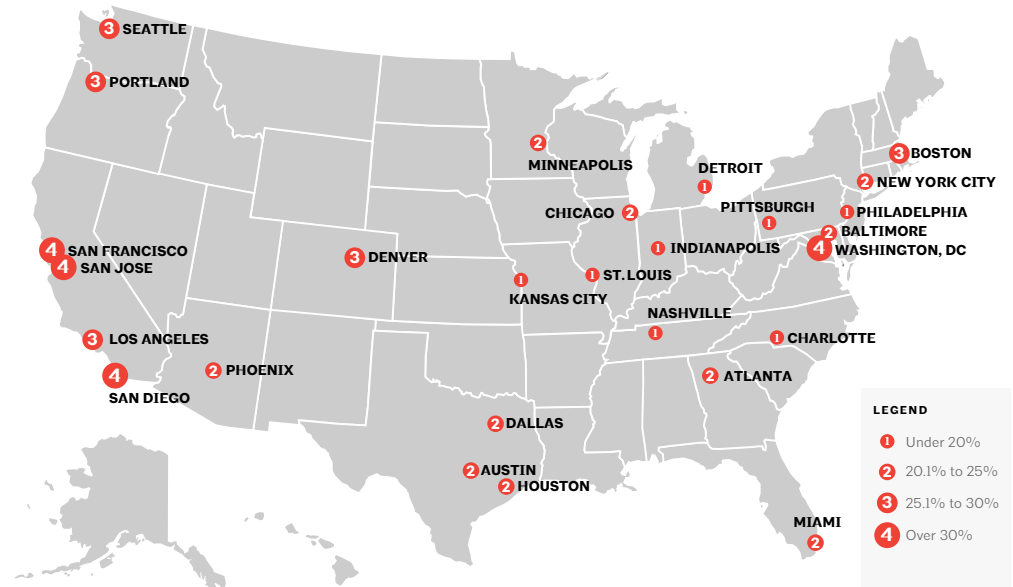
nonguaranteed (e.g., overtime, bonuses, profit sharing, and other cash compensation) versus guaranteed (i.e., base pay). Managing principals now have the largest share of their salary as nonguaranteed pay.

## Where You Work Matters

Even with the general staffing concerns facing architecture firms, the compensation pressures are much greater in some areas of the country than others. For example, of the 27 metropolitan areas detailed in the 2019 AIA Compensation Report where architectural compensation levels are estimated, average compensation in early 2019 (base salary plus incentives and bonuses) for unlicensed recent graduates of architecture programs was almost 20% above the national average in some areas, and close to 20% below the national average in others. However, these compensation disparities likely reflect cost-of-living differences as well as local area competitive pressures.

For example, average compensation for an unlicensed recent college graduate at architecture firms in San Jose was \$65,880 in early 2019, almost 45% higher than the \$45,800 average starting compensation in Pittsburgh. In general, metro areas with higher starting compensation were on the Pacific Coast or along the Northeast seaboard, with firms in Los Angeles, New York, San Francisco, San Jose, Seattle, and Washington, D.C., reporting the highest average compensation for unlicensed recent college graduates.

However, the firms in metro areas that offer the highest starting compensation may be forced to do so to compensate employees for the higher cost of living in these metros, particularly in regard to housing costs. For example, the unlicensed recent college graduates in San Jose that recorded the highest compensation also were faced with some of the highest rents in the country. The median rent in 2017 in the San Jose metro area was over \$2,100 per month or \$25,400 annually according to the American Communities Survey conducted by the U.S. Census Bureau. As a result, the average rent burden (the median annual rent divided by average annual compensation for unlicensed recent college graduates) in San Jose was 38.5%. The federal government considers any household to be rent burdened if rents account for 30% or more of income. With no additional wage earners in the household, the typical architecture college graduate in San Jose would be rent burdened, even with its top compensation levels.



### Compensation for a recent college graduate as a share of median rent

Share of compensation devoted to rent for college graduates (nonlicensed) in 27 metro areas. Median rents from American Communities Survey.

By contrast, in Pittsburgh the median annual rent was \$7,800, or about \$650 a month. With an average compensation of \$45,800, the average rent burden for a recent college graduate would be 17.1%, one of the lowest burdens for any of the metro areas covered by the AIA's recent compensation report. In general, areas with higher average starting compensation also tend to be areas with higher average rent burdens.

## Benefits Shifting

Overall, the value of fringe benefits offered by architecture firms to their employees in 2018 remained generally consistent with where it has been over the last several years, at about 17% of base pay for full-time professional, technical, nontechnical, and administrative employees, according to the 2019 AIA Compensation Report. However, the value of benefits for part-time staff continued its recent decline, falling to an average of just 9% of base pay in 2018, from a peak of 18% in 2012.

With the demand at architecture firms for qualified architectural staff rising in recent years, benefits, perks, and professional development support now play an increasingly important role in employment packages offered by firms. In addition, with firms paying greater attention to issues related to equity, diversity, and inclusion, firm culture has taken on a more prominent role to support employees along their career paths. And many of these benefits can also help firms to reduce their carbon footprint and meet sustainability goals, such as through offering employees remote work options, and through increased support for alternative forms

of commuting, like subsidies for qualified transportation programs (e.g., public transit reimbursement or a bike sharing program).

Providing employees with the option to work remotely is an employee benefit that has become so commonplace that 87% of architecture firms offered it to their full-time employees in some capacity in 2018. This is largely regardless of firm size, with 78% of small firms reporting that they offered remote work in 2018, and 97% of large firms reporting the same. The largest share of firms, more than two-thirds overall, offered remote work on an ad hoc basis. In contrast, just 13% of firms offer full-time, or nearly full-time, remote work, with more than one-quarter of large firms offering this type of remote work, versus just 4% of small firms that offer the same.

Many firms also report that in 2018 they made a specific effort to encourage diversity in hiring and actively engaged in steps to enrich firm culture and retain employees throughout different life stages. Eighty-eight percent of firms reported that they employed a formalized annual employee review process in 2018, while 36% conducted a salary equity assessment by gender and/or race, 27% had transparent promotion and compensation practices, and 20% had a formal employee retention plan. In addition, 80% of firms indicated that they have specifically hired, promoted, and/or mentored employees with diverse backgrounds, 43% have proactively sought to develop diverse employees for leadership roles, and 25% have developed a firmwide value of diversity statement. To provide additional support, 16% of firms have also provided training and/or resources around the topic of intercultural competence. **AIA**



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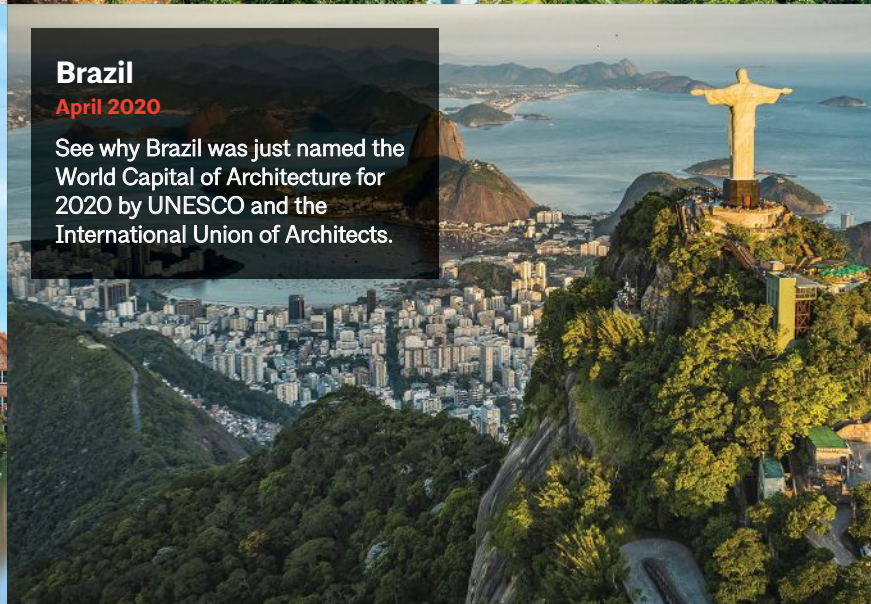
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# AIA Collaboration

## Elevating Unheard Voices

By Kathleen M. O'Donnell

Next month, the Architecture & Design Film Festival will launch its 11th season in New York City. This year's lineup of films showcases work that reflects society and history, highlighting untold stories of those who overcame adversity to shape the modern world. They are proof positive that while design films are often seen as niche, they don't have to be.

"We're thrilled that 2019 has yielded so many high-quality films about design that provide audiences with a look at influential people and places they may never have heard about before," says Kyle Bergman, AIA, ADFP's founder and director, giving a preview of some of the festival's highlights.

Commemorating the Bauhaus centennial, ADFP:NY's opening night film *The New Bauhaus* tells the story of László Moholy-Nagy, a Hungarian artist and educator who fled Nazi occupation in 1937 to start what ultimately became Chicago's Illinois Institute of Technology. "The film sends a strong message about the importance of a well-rounded design education," says Bergman. "They wanted to create critical design thinkers, not just provide vocational training."

As an architect who went down a nontraditional career path to launch the festival, Bergman sees immense value in interdisciplinary learning. "There are a number of films in this year's program that highlight the importance of offering creative design education opportunities," he says, adding that *The New Bauhaus* is one of many films that touches the intersections of education, historic events, and culture.

*Masters of Modern Design* profiles the lives and work of Japanese-Americans whose points of view were shaped by the post-World War II internment their families were forced to endure. The upbringing and education of notable artists and designers Ruth Asawa, George Nakashima, Isamu Noguchi, S. Neil Fujita, and Gyo Obatahir took on a different form than that of their contemporaries. "The film shows that teaching art can be a way of dealing with stressful situations and how powerful design can be," Bergman says.

Shedding light on the often-overlooked accomplishments of women designers, ADFP:NY's closing night film, *City Dreamers*, depicts the accomplishments of Phyllis Lambert, Blanche Lemco van Ginkel, Cornelia



Cornelia Hahn Oberlander, one of the subjects of *City Dreamers*, a film focusing on the work of four women architects and planners.

Hahn Oberlander, and Denise Scott Brown, HON. FAIA. These four individuals' work in architecture, urban planning, and landscape architecture transformed the way American and Canadian cities will function for decades, and has set an example for generations to come.

"The ADFP programmers have been consistently frustrated by a lack of good films about female architects and designers," Bergman says, adding that even though there still aren't enough, *City Dreamers* may inspire more to come. Architecture and film are two industries similarly working to overcome problems of representation and gender equity. Bergman proudly notes that nearly 50% of this year's selected films are directed by women.

As ADFP travels to many cities during the upcoming election year, it won't miss the opportunity to make audiences aware of the ways designers are addressing social and environmental concerns. In addition to *The New Bauhaus*, *Masters of Modern Design*, and *City Dreamers*, more films touching on urbanism and sustainability—as well as winning films from the 2019 AIA Film Challenge about architects and civic leaders building in light of climate resilience—will screen at events across the country. "We hope that people who walk into one of our films this year leave with a better understanding about the important impact design has had on their lives," Bergman says. **AIA**



Vancouver, a city shaped by Cornelia Hahn Oberlander, features prominently in *City Dreamers*.

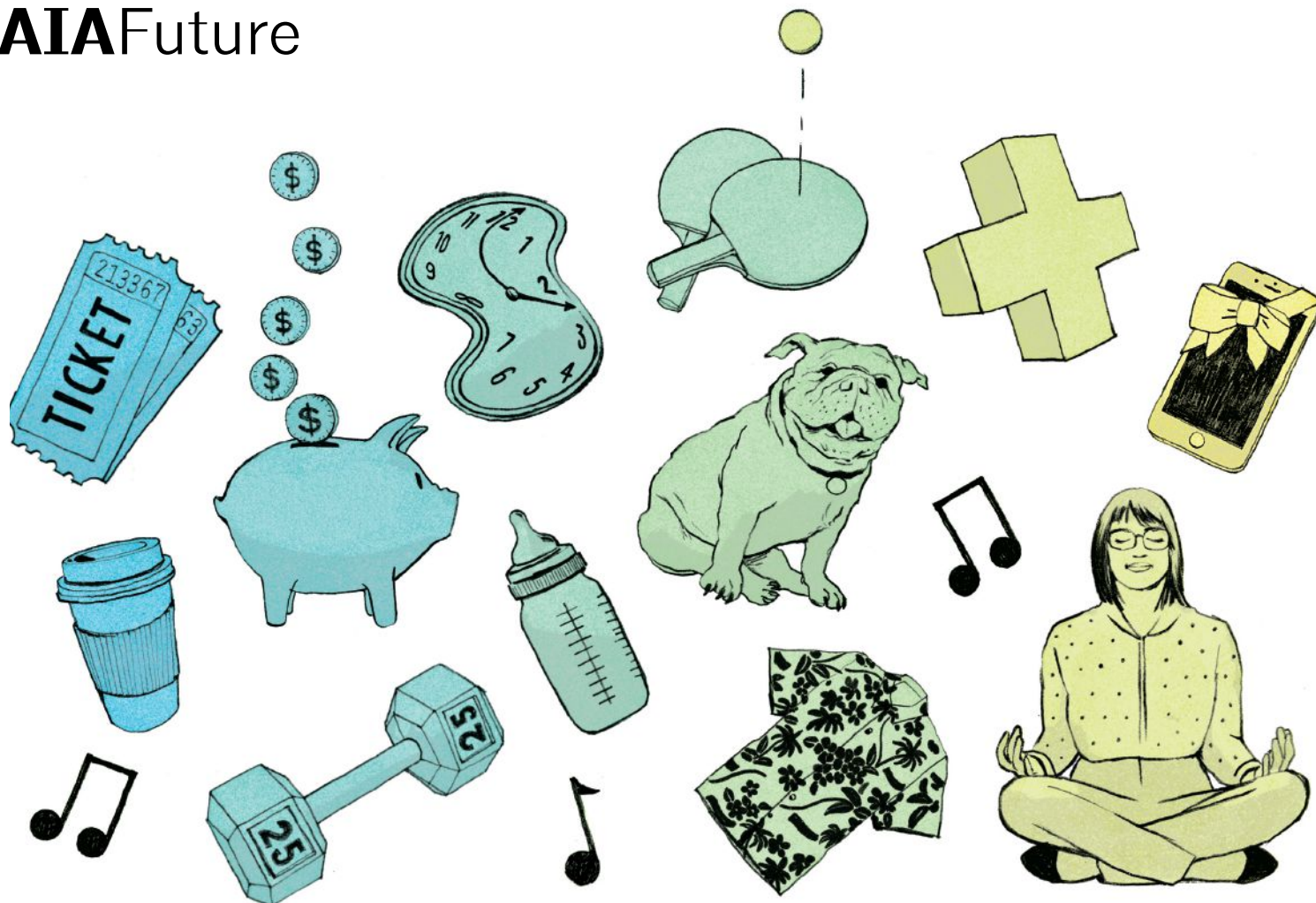
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# AIAFuture

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## How Do Your Benefits Stack Up?

**In a competitive hiring market, firms are upping the perks they offer employees.**

By Katherine Flynn

As a small firm, Work Program Architects, in Norfolk, Va., employs just 10 people, and principal Mel Price knows that in order to compete with larger firms for talent, it needs to get creative.

“Small firms aren’t always able to offer the same salary and full compensation packages that large firms are, but I feel like we offer [a] wonderful environment, and that also is evaluated heavily,” she says. Her firm is currently in the process of hiring three people, and Price says she has received a number of emails from prospective hires saying that salary isn’t necessarily the primary factor in their employment decisions. But things like an office-provided cellphone, tablet, or laptop (currently offered by 65% of firms) or a

wellness program with participation incentives (34%) might be.

Firms of every size are increasingly placing an emphasis on fostering a strong office culture, according to AIA’s 2019 Firm Compensation Report. This means offering options like flexible working hours (as 83% of firms currently do) and a casual dress policy (offered by 90% of firms). Many firms recognize that building a strong sense of identity around what it means to be an employee there is just one piece of the puzzle, while another is offering benefits that fall under an increasingly broad definition of the term.

“One of the things that we did when we started the company was made sure we had a really good sound system,” Price says, laughing. “It’s easier to relax when people [might want] to work late.”

### “Who Are You Employing and What Do [They] Want?”

As the architectural workforce skews younger and demand for qualified architectural staff continues to rise, there’s a growing emphasis on supporting employees along their career

paths—whether that means paying off a recent graduate’s student loan debt, subsidizing a conference or training, or covering the cost of licensure exams.

“I think the thing around benefits really has to do with who are you employing and what do those folks want? What do they see as valuable?” says Petrina KM Gooch, ASSOC. AIA, a principal and corporate human resources leader at Los Angeles-based HED Design, a large firm with 435 employees across eight cities.

“What appeals to somebody early in their career may not be the same thing that’s appealing to somebody later in their career,” Gooch continues, explaining that her firm started offering a high-deductible health insurance plan with a partially funded health savings account. “Over time, we’ve seen a larger-than-expected adoption, and adoption with folks who have families, because people are kind of getting savvy about this,” she says. The plan allows those who opt in to save on premiums, while accruing money that they can use for health care costs down the road.

An emerging “hot topic” in the industry, according to Gooch, is student loan repayment, currently offered by about 3% of firms.

# AIA Future

(CONTINUED)

“There are conversations around firm-sponsored options,” she says. “Industry leaders are supporting policy that can help relieve some of the student loan repayment pressure for employees that are recent graduates.”

ARE reimbursement and a bonus upon licensure are three perks offered by BWBR, a firm based in St. Paul, Minn.

“The marketplace is so competitive out there right now that you really have to look at [benefits] as a holistic part of what you’re offering employees,” says Angela Shaw, human resources manager at BWBR. The number of firms currently offering reimbursements for licensure fees is 82%, and 65% offer ARE study materials, classes, and study groups. In 2018 about half of all architecture firms offered direct funding of professional development to staff.

## A Trend Toward Wellness

Increasingly, firms are trending toward offering wellness perks, with the intention of improving the overall health of their workforce. At Work Program Architects, employees receive an extra \$50 in each paycheck if they walk or bike to work, and the firm covers gym membership fees. This tracks with the 25% of firms that offer a gym or fitness club membership, as well as the 34% of firms that offer a wellness program with incentives for participation.

Firms also recognize the link between wellness and community building in the office, especially from a mental-health perspective. For the past nine years, BWBR has had an in-office well-being committee that organizes physical activities like canoe trips, spurred by health insurance increases that were proving troublesome for the firm to manage.

“I think it’s an important part of allowing people to make connections beyond the work,” Shaw says. “It’s a lot easier to work with someone if you have those personal connections and you know them on a different level.”

For HED Design, this connection comes in the form of office breakfasts and in-office happy hours, the newest iterations of traditions that reach as far back as the firm’s 111-year history.

“Those are things that people look for in this age where everyone’s connected with social media, but people do still have a real desire to be a part of something bigger than themselves,” Gooch says—a sentiment that rings true no matter how the hiring market is trending. **AIA**

# AIA Perspective



## Doing Good by Doing Right

The profession of architecture has distinguished itself by combining art, science, and ingenuity to elevate the human experience. Our future is limited only by our ability to adapt to the society we serve. The next generation of professionals, Generation Z, typically considered to be those born from 1996 to 2010, along with their older siblings, millennials, will shape society far into the next century.

We must ask ourselves, “Will we leave a profession that future generations will want to join and to make a lifelong career?”

AIA’s recently released Compensation Report contains good news and raises a few areas of concern for the profession. The survey reports that nonresidential construction activity has increased 40% in the past seven years, and that the decade-plus business expansion has led to increased compensation levels for architecture positions at U.S. firms.

In my view, what bears directly on the future of the profession is how we pay recent graduates. The report found that recent graduates of architecture programs in more than two dozen metropolitan areas—from Atlanta to Pittsburgh, to Minneapolis to San Jose—earned on average total compensation of \$55,800. While that is more than the average of all U.S. workers (\$47,060), it is well below comparable professions.

For instance, the average starting salary for a first-year attorney, according to the National Association for Law Placement, was about \$100,000. While the average salary of a first-year medical resident is approximately \$59,000, the average salary of a family

physician, which tends to be on the low side of the physician pay range, more than doubles to \$138,000 in just a few years.

Further, consider that where you begin a career as an architect is a significant factor in your financial security and stability. Let’s look at two examples: Pittsburgh and San Jose.

According to the Compensation Report, San Jose had the highest average pay, at \$65,880. However, much of that salary is consumed by the region’s high cost of housing. According to the American Communities Survey, which is conducted by the U.S. Census Bureau, the median rent in the area is \$2,100 per month—or 38.5% of the reported average annual compensation. For context, the federal government considers households who spend more than 30% of income on rent as “rent-burdened.”

On the other end of the spectrum, in Pittsburgh, which reports the lowest average salary of the 27 metro areas included in the compensation report, the average rent is about 17% of income.

Beyond financial stress, there is the issue of calibrating the demands of business and the expectations of home life. According to most studies, the next generation to enter the workforce wants more of a balance between work and home. A 2018 survey by Ernst & Young found that 73% of Generation Z respondents cited “having a good work-life balance” as the biggest measure of success. Half cited flexibility as a key priority when considering an employer.

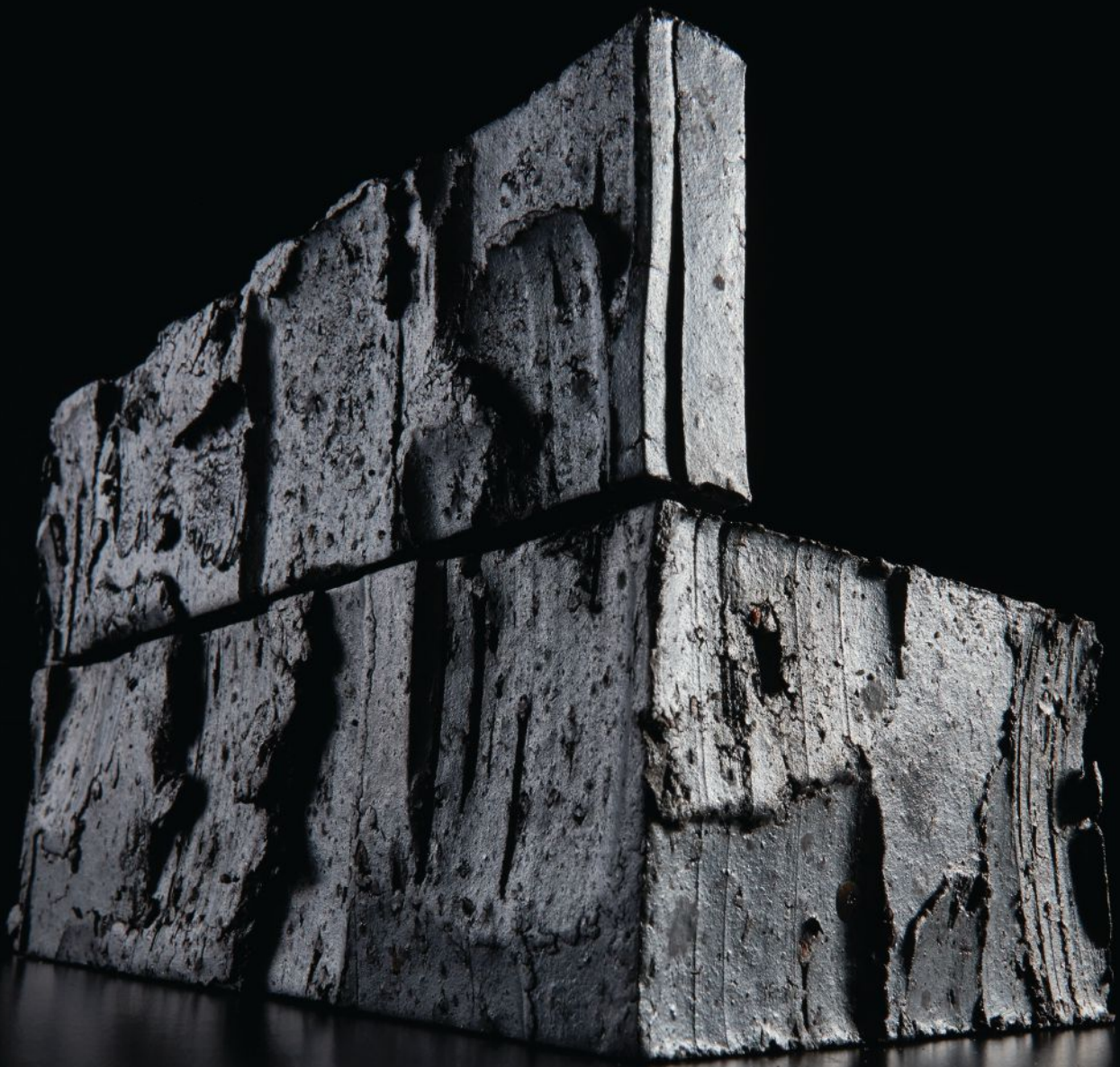
The fact is, people don’t perform at their highest level if they are worried about keeping a roof over their heads or feeding their families as they pursue their dream. Further, the expectation of regular 80-hour workweeks is out of step with what the next generations want from their careers and employers.

To ensure that architecture is a 21st century profession that is regarded as a trusted partner for progress and a leader in the community, we must change how we educate, compensate, and motivate our workforce.

Ultimately, accomplishing our long-term goals—mitigating climate change and ensuring social justice and economic opportunity—comes down to attracting and retaining the best minds and talent. It is clear to me that if we want to continue to do good, we must do right by everyone. That means ensuring that those in the profession (both those working to join it and those already in it) are treated with respect and dignity, as individuals and as professionals throughout their careers. **AIA**

William Bates, FAIA, 2019 AIA President





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“Clearly the city has turned a tidy profit on its investment in the High Line. The question is whether that investment was worth it.”

This past June, almost a decade after the High Line first opened in 2009, and long after I'd written it off as a place that isn't really for New Yorkers, I rediscovered it. Unexpectedly, my epiphany came when I was visiting its new neighbor, Hudson Yards, with a group of students to tour the Shed, the development's multipurpose arts institution, and to climb the 154 stairways of Vessel, the Thomas Heatherwick-designed folly, in an attempt to discuss the overall honesty of the place (we'd been reading John Ruskin's "The Lamp of Truth"). We gathered in a little elevated plaza, called the Spur, located immediately east of 10 Hudson Yards.

Built in the 1930s, the Spur originally connected the old rail line to the post office distribution center, a mammoth facility on 30th Street. It wasn't included in the original High Line design, but after a dogged "Save the Spur" campaign, the city embraced the idea. In early June, the Spur finally opened, the last section of the High Line to be completed. My students and I sat on a set of tiered bleachers, constructed of artfully arranged piles of lumber—the perfect spot to discuss 19th-century architectural theory in 21st-century New York.

The contrast between the Hudson Yards plaza, designed by Nelson Byrd Woltz and still a work in progress, and the Spur, designed by the same team



The Spur, the newly opened section of the High Line

that fashioned the rest of the High Line—James Corner Field Operations, Diller Scofidio + Renfro, and the horticulturalist Piet Oudolf—was striking. With its own massive artwork, currently a 16-foot-tall bust of an African American woman by artist Simone Leigh, and views up and down 10th Avenue, the Spur felt welcoming, a place where you could hang out for hours. It's a kind of antechamber, a spot to pause and adjust when leaving the streets of Manhattan for the rarefied atmosphere of Hudson Yards.

But I didn't fully comprehend what made the Spur feel so different until later the same afternoon, when I said goodbye to my students and headed south along the High Line to Greenwich Village to rendezvous with some friends at a bar. Justin Davidson, *New York* magazine's architecture critic, recently lamented that the High Line has become "an elevated cattle chute for tourists, who shuffle from [Renzo Piano, FAIA's] Whitney Museum to Hudson Yards, squeezed between high glass walls and luxury guard towers." But some of the people I passed were office workers heading home, deftly weaving their way through the selfie-shooting hordes with the no-nonsense briskness of real New Yorkers. Clearly the High Line has become a pedestrian parkway for locals. I also realized that it still gave me pleasure to travel along it, to look at the surrounding city from above street level, peering down side streets and taking note of the changing architectural tableau, my walk entirely unimpeded by cars and stoplights.

Aspects of the elevated walkway that felt overdesigned a decade ago—the benches that sometimes appear to grow directly out of the pavement, the seating areas that step downward toward views of the street, the careful plantings, the blocks of cement with carefully spaced cracks in between—now struck me as generous. Maybe it's because so much of the world seems contrived today, but there's a sincerity to it, an honest desire to respond to the needs of the public, to draw them in, to inspire their curiosity, to make them notice the underlying structure of the park, the artworks interspersed with the plantings, and also—maybe especially—to observe the surrounding city.

The High Line may have touched off a global movement to turn every neglected industrial remnant into an urban destination, but it also inspired a backlash. The over-the-top nature of neighboring development—a penthouse apartment in a High Line-adjacent Zaha Hadid-designed condo was recently listed for \$48.8 million—tends to support the argument that this park, and every new urban park, is an evil act of alchemy, helping to transform a functioning city into an obscenely luxurious one. But I think the backlash misses an important point.

#### A Softening of Sharp Edges

To better understand the High Line on its 10th anniversary and the impact it's had on the surrounding neighborhood, much of it in response to the park and the rezoning that accompanied it, I decided to take a couple more walks. One by myself and one with Robert Hammond, the High Line's co-founder and executive director.



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The High Line begins south of West 14th Street and stretches north to 30th, where the main section of the elevated walkway swings left and wraps around the west end of Hudson Yards in a looping path—a refreshingly under-landscaped section—and then slopes down to meet West 34th Street at the spot where Megabus riders line up to board their bargain coaches. On a Tuesday morning in early July, I started my solo jaunt at the south end, where a few meat warehouses are still tucked beneath the structure. I climbed the wide staircase adjacent to the Whitney, and was thrilled to find a set of public restrooms that I assumed were part of the museum. (Hammond later told me that they’re housed in the Friends of the High Line headquarters, also designed by Piano. “Were they clean?” he asked. Yes, they were.)

In 2009, when Hammond’s co-founder, Joshua David, gave me a pre-opening tour of the High Line, the so-called Gansevoort Woodlands at the southern end consisted of scrawny saplings, which today have become credible trees—not huge, but big enough to offer shade. Much of the greenery now looks gangly and overgrown, like something from a more natural setting. The messiness of the flora has softened the design’s original hard edges and has lessened its self-consciousness.

A parallel efflorescence has happened next to the High Line, a spurt of development along its path. This boom may be happening throughout New York, but it’s been magnified here by the narrowness and elevation of the High Line. Initially, the fact that the project was a magnet for architecturally adventurous development seemed like a good thing, an animating moment for a stodgy city. Just ahead of the 2008 economic downturn, pioneers like Neil Denari, FAIA, and Della Valle Bernheimer completed joyously weird, angular apartment towers full of pricey condos. At the time, I regarded the area around the High Line as Manhattan’s first real 21st-century neighborhood. The recession put the 21st century on hold, but only briefly. On my recent walk, I noted the new buildings, including several under construction that I’m optimistic about, in particular Studio Gang’s office building on 10th Avenue, just north of the landmark Standard Hotel, which will feature a black glass façade with a fractal look, shaped to direct the sun onto the High Line and reduce glare on the nearby roadway.

Where West 18th Street meets the High Line, the development has reached a fever pitch. To the west is BIG’s XI complex, consisting of two skewed towers, one 34 stories and the other 25, both housing luxury condos. The tower closer to the High Line will also include a hotel on its lower floors. Immediately north

are a pair of Heatherwick-designed condo buildings, 21 and 10 stories tall, respectively, with one on each side of the High Line. Their most conspicuous feature are the windows: oversized and multi-paned, they bulge like a bug’s eyes. My sense is that the BIG project will be better served by its respective eccentricities than Heatherwick’s, but it’s too soon to judge. In both cases there’s an attempt to relate somehow to the aesthetic demands of High Line proximity, a kind of unwritten zoning requirement for fabulousness.

What I noticed as I walked north is that the closer you get to Hudson Yards, the more banal the towers become. The High Line ethos peters out as buildings like 507 West Chelsea come into view—a black glass rental apartment building that bills itself as “luxury living on the High Line” but seems more like an offshoot of Hudson Yards.

#### **New York Without the High Line**

What would this stretch of Manhattan have been like without the High Line? How much development would have happened anyway? What if Hudson Yards existed, but the High Line didn’t? What then?

I posed these questions to Hammond during our walk a few days later, which began at the Spur. He took pleasure in pointing out details that I had failed to notice, like the fact that the Spur has public restrooms, easy to overlook because the signs are inconspicuous to the point of being invisible. But the most interesting story he told was about the park’s prehistory. According to Hammond, in the 1990s, then-Mayor Rudolph Giuliani was intent on tearing down the High Line because he wanted 10th Avenue to be redeveloped as a high-rise residential corridor, much like Sixth Avenue in Chelsea, which was rezoned from manufacturing to high-density residential in 1995. According to Hammond, Giuliani considered the High Line an obstacle to the construction of apartment towers, so it had to go.

Giuliani, of course, wasn’t the only one with a bead on the far west side. Schemes for redeveloping its largely industrial neighborhoods had been in the works since the 1950s, when the Hudson Yards site was considered for a major project by the legendary developer William Zeckendorf. In the 1970s, Philip Johnson, according to Mark Lamster’s 2018 biography of the architect, *The Man in the Glass House* (Little, Brown & Co.), designed “an enormous middle income housing complex” called Chelsea Walk for the same site. Those schemes weren’t realized, of course, but the subsequent demolition of the old West Side Highway in the late 1970s and early 1980s opened the west side of lower Manhattan to high-end residential



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development and spurred the creation of another real estate magnet, the Hudson River Park. A couple of blocks west of the High Line, and a work in progress since the 1990s, the park has “attracted \$3 billion in new construction at 94 new buildings in adjacent neighborhoods,” at least according to the project’s website. (That total probably doesn’t include “Diller Island,” the \$250 million Heatherwick-designed remake of the Hudson River Park’s Pier 55, a project funded by Barry Diller and Diane von Furstenberg and scheduled for completion in 2021.)

In the late 1990s, Peter Eisenman, FAIA, had contributed his vision for the west side when he won an ideas competition for a site atop the railyards. His scheme called for an office tower on the current site of Madison Square Garden as well as a new sports arena and television studio complex, all situated on a deck over the yards, along with a lot of parkland—not to mention a football stadium submerged in the Hudson River. Eisenman’s concept never had a prayer of being realized, but it was a harbinger, and the area above the railyards soon became a draw for luxury development.

### **An Open-Air Museum of the Present Moment**

All of which is to say that remaking of the far west side would have happened without the High Line’s transformation, even if it wouldn’t have happened in quite the same way. Indisputably, much of the development directly along the elevated park was the result of a 2005 rezoning that encouraged such growth, with the assumption that the additional real estate tax revenue would more than cover the cost of the park’s construction. The High Line, not including the Spur, cost about \$187 million to build, the bulk of that—\$123 million—coming from the city. Initial estimates predicted that the park would increase real estate tax revenue for the city by \$250 million, but that figure was soon raised to \$900 million in estimated revenue by 2038.

Clearly the city has turned a tidy profit on its investment in the High Line. The question is whether that investment was worth it. Would New York be better or worse off without the High Line? The answer depends on whether we (those of us not in the market for a \$48 million penthouse, anyway) get any value out of having buildings by Hadid, BIG, Heatherwick, and other luminaries in our city. If the alternative scenario would be the High Line as an undeveloped industrial ruin, surrounded by a West Chelsea of taxi garages and low-rent artists, I’d say screw the starchitects. But the more likely scenario, assuming the High Line hadn’t been restored, would be something that resembles Riverside South, a mostly residential complex some





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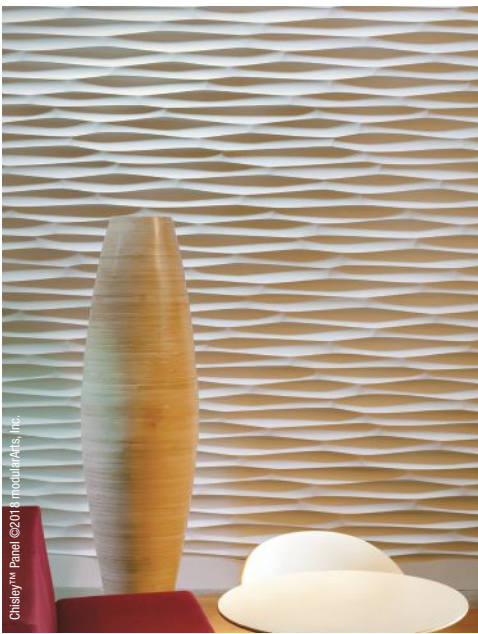
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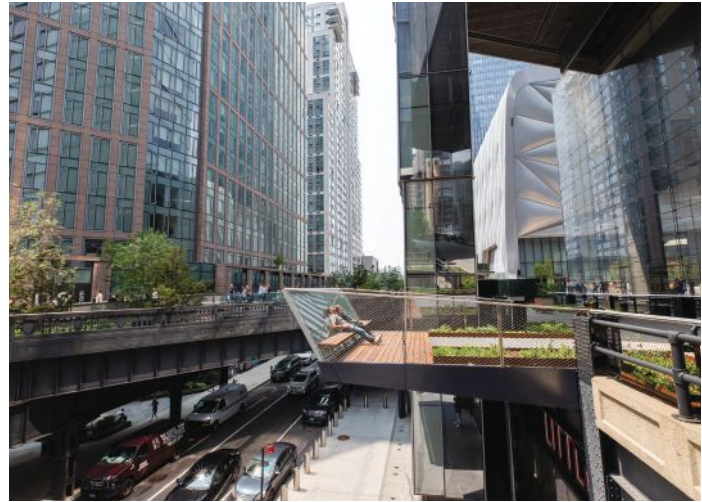


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30 blocks uptown along another disused railroad property. A lineup of 19 buildings with little to recommend them architecturally, they nevertheless remain largely unaffordable to most of us. The High Line, for better or worse, created a context for a kind of residential architecture that hadn't previously existed in New York City. We couldn't have gotten the park without the development, but we could easily have gotten the development without the park.

During our walk, Hammond pointed out a seating area along the walkway that connects the Spur to Hudson Yards and that includes a bench designed to allow you to lean back and look up at the buildings. It's a cool idea, never mind that the view is of the less-than-inspiring pinnacle of 10 Hudson Yards. This kind of detail is the thing I love about the High Line, that it's designed to immerse visitors in the city around them, a virtue that's even more striking after you've experienced Hudson Yards' uncanny isolation from the familiar patterns of New York City life.

What Davidson described as a cattle chute, I regard more as an open-air museum of the present moment. If you walk west of Ninth Avenue and north of the Whitney Museum, the city looks and



An inclined bench along the Spur, which offers a view of 10 Hudson Yards

feels radically different than it did a decade ago. The High Line encouraged the arrival of the 21st century in a city that didn't otherwise welcome it and has become the perfect vantage point from which to watch the subsequent changes unfold. The crowds can be insufferable, as they are for any blockbuster exhibition. But it's also a great show. If you want to immerse yourself in the New York City of right now, the High Line is still the place to go.



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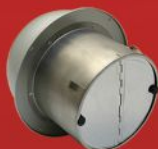
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“Drug money has itself become a drug to some in the development community, clouding their judgment and encouraging architectural hallucinations.”

In our age of social inequality, ongoing environmental damage, an exponential increase in human population, the rapid depletion of finite resources, and extinction of irreplaceable species, architects have necessarily expanded the scope of what they care about, and that has led to an ethical turn in the profession. Now a required part of architectural education (and a frequent topic at conferences), ethics has become an integral part not just of architectural practice, but also of how we think about and go about designing the built environment. The ethical turn in 21st-century architecture holds that the people most affected by architects' decisions and actions need to be engaged and active participants in the design process, which begins with an empathetic understanding of diverse perspectives and a respect for cultural and climatic differences.

My latest book, *The Architecture of Ethics*, published by Routledge, does not advocate a particular ethical position or posit some grand moral system, but instead reflects the diverse ways in which ethics can help us understand the dilemmas that architects face in practice and the design of the built environment. The following three excerpts adapted from the book consider some of the most ethically contentious issues the profession currently faces.

#### **Licensure**

Professions have long seen licensure as distinguishing them from other commercial enterprises, indicative of the years of training and specialized knowledge that professionals must command. Licensure gives the person who holds it the right to practice. But with rights come responsibilities and here, ethics comes into play: Licensure also means that professionals have an obligation to attend to the interests not only of the clients who pay for the architect's services, but also of the general public: those who will directly experience the results of a professional's work and those affected by it only indirectly in some faraway place or in some future time.

Although such shibboleths may sound straightforward, complexities arise when two professions vie for the same turf, which has happened in the U.S. as architects have battled with interior designers over the latter's attempts at becoming a licensed profession. While the opinions of architects on this matter vary considerably, the architectural community as a whole has argued that interior designers should not become a licensed profession. Meanwhile, many interior designers have portrayed that opposition as little more than turf protection, combined with a degree of condescension and gender

bias on the part of a predominantly male profession toward a predominantly female one.

This standoff highlights the contradictions that can occur when a field operates as both a profession and a commercial activity. The American jurist Wesley Hohfeld argued that rights are duties viewed from another perspective and that our duties differ depending upon what rights we are talking about. Professions, for example, have a duty to prevent those who lack the proper qualifications from practicing by upholding licensure laws, and yet when that duty stems from a desire to suppress a legitimate competitor, the profession has no right to do so and, moreover, has a duty to refrain from such anti-competitive behavior. Those against the licensure of interior designers have to make a viable case that it would endanger public health, safety, and welfare.

The architectural community has raised the possibility that interior designers, if licensed, could team up with engineers and design a building without ever involving an architect. While this might result in some ugly buildings, architects have not made the case that such a pairing—even if it ever happened—would endanger the public, and so this argument seems like a blatant anti-competitive position of not wanting interior design/engineering alliances to reduce the amount of work going to architects. To use Hohfeld's logic, architects have no right to make such a claim—certainly without ample evidence to back it up—and have, instead, a duty to refrain from it.

Another challenge comes from the fact that other building-related fields such as engineering and landscape architecture are licensed, something that the architectural community has long accepted. Architects depend upon those other fields for the specialized knowledge they bring to projects, expertise that building designers may not have. But when the work overlaps with what architects do, as is the case with

**A more creative solution might involve the licensing of the integrated teams that will increasingly create our built environment.**

interior designers, the former have fought off the latter, arguing that any effort to define the difference between their respective responsibilities becomes impossible.

Further, architects have claimed that since they already have legal responsibility for the entire building, inside and out, licensing interior designers





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The huge amounts of ill-gotten money flowing into real estate have led to overdevelopment, reflecting the amount of funds in need of laundering rather than what the market itself can sustain.



Dubai, where money laundering has clearly influenced new development

becomes unnecessary and redundant. Yet here too, the argument sounds self-serving. Electrical, mechanical, and structural engineers, for example, often work extensively on the inside of buildings, and architects have not questioned the legitimacy of engineers' licenses. Why then do architects question the expertise of interior designers whose knowledge of furniture, fixtures, and finishes often extends far beyond that of most architects?

This dispute has become more heated as the global economy has increased competition between the two fields. As design services have become readily available from almost anywhere around the world, the urge to protect one's turf becomes ever stronger as free-trade fervor seeks to override all such protections. This has led, in the case of interior design licensure, to the decidedly odd situation of libertarian groups opposed to professional licensure joining licensed architects trying to prevent their interiors colleagues from becoming so. How long will it take before these same libertarian groups turn on architects? As Aesop famously said: "We often give our enemies the means of our own destruction."

While politics has dominated the battle over interior design licensure, ethics may offer more help in sorting out which of the antagonists in this situation have right on their side. Both architects and interior designers have claimed to have the best interests of the public in mind when defending their positions, but

when we consider what would bring the greatest good to the greatest number of people, it becomes hard to support either side, since internecine war between two professions does a lot of damage to the reputations of both and very little to help anyone else.

If anything, the growing belief that the greatest good comes from a more integrated form of practice, in which architects, interior designers, engineers, landscape architects, and contractors work more closely together, makes this dispute over licensure seem like a battle from the last century. A more creative solution, and one that would allow both sides to transcend this self-defeating fight, might involve the licensing of the integrated teams that will increasingly create our built environment. We can become so intent on protecting our turf that we don't notice that the ground has shifted beneath us and that the turf we have so long protected may no longer matter.

#### Money Laundering

Although it remains little-discussed among architects, money laundering has long funded big projects around the world. A quick perusal of the banking literature shows why buildings attract so much dirty money: You can buy them for cash and you can pay extraordinary amounts of money to upgrade them, again for cash, all of which can be explained as legitimate and legal expenses. Real estate has been one of the fastest ways to launder money and many architects and developers have benefited from this, generating more demand for space than the marketplace might need.

Money laundering remains illegal in most places, however, and the more that architects look the other way, the more the profession becomes complicit in it, which is itself a crime. In the U.S., the Money Laundering Control Act of 1986 makes it illegal to launder money from unlawful activities or to conceal the source, ownership, or control of those funds. The U.K. has gone even further: The Proceeds of Crime Act of 2002 criminalizes concealing, failing to disclose, tipping off, or just being involved with a money launderer. Which makes shrugging off such activity a possible path to prison, or at least stiff penalties.

The fragmentation of the building and development industry, though, makes it hard to catch and easy to conceal such activity. Architects focus on designing and constructing buildings within the budgets a client gives them, rarely asking where the money came from or whether it was obtained legally or not, and yet many design professionals probably get a sense at some point in a project if a misalignment seems to exist between the funds being spent and what a particular client would likely have available.



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Large cash transactions for building products or professional services, for instance, should send a warning sign to architects, however much they may not want to acknowledge it, with what may otherwise be a very lucrative project. Ignoring such signs does not constitute a defense, since even indirect involvement in a money-laundered project creates culpability.

As in so many situations, it doesn't much matter what approach to ethics you consider; all lead to roughly the same conclusion. Virtue ethics would hold that looking the other way when suspecting the laundering of dirty money is imprudent and cowardly, while contract ethics would take the position that such behavior breaks the social contract of professionals by concealing criminal activity that society would want us to reveal. At the same time, duty ethics would have us blow the whistle on the money laundering simply because it is the right—and legally binding—thing to do, while utilitarianism would remind us of the greater good of the greatest number of people, which money laundering does little to advance.

Governments have made it easy to report money laundering. In the U.K., the report would go to the National Crime Agency; in the U.S., it would go to the Department of the Treasury's Terrorism and Financial Intelligence office. But governments themselves, or at least some powerful people in government, can become complicit in such laundering schemes. Donald Trump's development organization, for example, has licensed its name to buildings that have reportedly served as money laundries, from Panama to India to Indonesia. The Trump Organization has also paid fines and settlements for money laundering, without ever admitting guilt, as if to shrug and say that this is just how business gets done in the development field.

For legal as well as ethical reasons, the development industry needs to change this situation. The huge amounts of ill-gotten money flowing into real estate have led to overdevelopment in some places, reflecting the amount of funds in need of laundering rather than what the market itself can sustain. That in turn can lead to overly ambitious and underperforming buildings that become albatrosses for communities, burdening them for years to come. The use of dirty money to fund projects also corrupts architecture, leading to the overly elaborate, highly complicated, and increasingly expensive designs that money launderers use to wash as much cash as possible.

In that sense, drug money has itself become a drug to some in the development community, clouding professional judgment and encouraging architectural hallucinations. While the vast majority of architects and developers have stayed clean, it remains both

highly alluring and widely available, depending on the place and the people involved in a project. Ending the epidemic in drug use would reduce the amount of money in need of laundering, but until then, with so much cash continuing to circulate in the global development industry, the profession of architecture has but one option when asked to design a project built on dirty money: Just say no.

#### **Moral Foundations**

Over my career, I have written about buildings located in non-Western countries, and I have always felt torn in how to respond to architecture there. How much do my Western values influence my response to their design, and how much do the people in these places embrace—or not—the Western ideas embodied in buildings designed by architects from Europe or North America? Also, how much do these structures represent an aspiration on the part of these clients to signal their connection to the global marketplace in which internationally known architects trade, or do they stand as foreign outposts of globalism in places that remain decidedly local and tradition-bound in character?

Such questioning led me to moral foundations theory, which seems to provide, if not a simple answer, at least a way to think about global practice that I find helpful. Developed by the social psychologist Jonathan Haidt and his colleagues, Craig Joseph and Jesse Graham, this theory rests on six foundational ideas that they see as guiding people's judgments about right and wrong across many different cultures. They include:

1. The care and protection of others.
2. Fairness and proportionality in how we interact with others.
3. Loyalty to family, friends, group, and nation.
4. Respect for authority and tradition.
5. A sense of sanctity and avoidance of disgusting things.
6. A love of liberty and freedom from coercion.

Haidt and his colleagues claim that Western, liberal democracies have greatly valued three of these foundational values—care, fairness, and liberty—while downplaying the other three—loyalty, respect for authority, and sanctity—that many non-Western societies and more conservative citizens tend to value just as much. That argument has been controversial, especially in the West, since it suggests that liberalism has emphasized a narrower set of ethical values than conservatism, which these authors claim has tended to embrace all six foundational ideas more equally. We won't enter that debate. But moral foundations



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theory does offer a useful way of thinking about the relationship of architecture and ethics, particularly across Western and non-Western cultures.

Consider what, for many people, constitutes the most important building in their lives: their home. In many ways, the house, as a building type, epitomizes the foundational value of care, since it typically represents the place in which people share with their family members, seek solace in difficult times, and attend to the needs of some of the most important people in our lives.

The typical Western, single-family house can be as varied as the clients they shelter and their communities and climates. But most follow a basic formula of semi-private living, dining, and kitchen spaces into which guests can enter and stay, and more fully private bedrooms and bathrooms often located further from the front door. As such, contemporary Western houses combine care with fairness and proportionality, where the relative size and relationship of rooms expresses the fair disposition and proportional arrangement of

rights and responsibilities of the home's occupants. Here, values trump functionality.

A child might need more space than parents in a bedroom, given the time some youth spend in their rooms, but parents frequently get the larger amount of square footage, tellingly called the master bedroom, because of the latter's greater position in the family. At the same time, children frequently get rooms roughly the same size, as a statement of the fairness that undergirds most Western families, regardless of whether one child might need more or less space than another.

Foundational values, even among Western countries, can vary widely from one culture to another. Although most houses in the U.K. or in Europe do not differ significantly from the gradation of more or less private spaces of the typical North American house, context does make a difference. Many more houses on the European continent, for instance, occupy existing buildings or share party walls with neighbors, often leading to a tighter configuration of rooms and a greater dialogue between old and new than found



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in North America. From an ethical perspective, that reflects a somewhat greater emphasis on tradition and authority—on respect for the past and existing urban fabric—than is often found in more individualistic countries like the U.S. or Canada.

However, as I have learned working with students from South Asia, respect for authority, loyalty, and sanctity remain much more dominant values in the housing there. In Kathmandu, Nepal, for example, the typical urban house is multi-level and multi-generational, with the older members of a family—parents and grandparents—on the lowest level and younger members of the family on upper floors, with living spaces and a rooftop terrace to take advantage of light and air, and with a prayer or meditation room located within the house itself. The accommodation of multiple generations of family members, with one generation watching over another, reflects the importance of loyalty to the extended family, while the inclusion of a space for prayer and meditation reveals the value placed on sanctity and on having a sacred space separate from the rest of the house and activities such as cooking or sanitation.

Such differences in how we dwell do not mean that one is better than another or that Western cultures do not care enough about loyalty and sanctity, or non-Western ones about freedom and fairness. All of the foundational values that Haidt and his colleagues have identified exist to different degrees in every community and in every family, or we wouldn't call them a community or a family. What this does mean, though, is that we need to listen carefully, especially when working in cultures different from our own, to what people value and prioritize in their lives and not just about what they need functionally or what the codes allow legally.

The functionalism of Modern architecture has its place, since no one wants to live or work in a dysfunctional building, but the reduction of architecture to function allowed some Modernists to make the mistake of assuming that because all people have similar physical and biological needs as human beings, they also all share the same values, goals, and views of the world. The International Style, in that sense, represented a morally oppressive architecture, imposing not just an aesthetic, but also an ethics foreign to many people around the world. The glass, steel, and concrete towers that now exist in cities across the globe have sturdy enough physical foundations, but their moral foundations remain questionable and they stand, ethically, on shaky ground.





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# SIX EXEMPLARY DESIGN STUDIOS CRAFT SOLUTIONS TO SOCIAL PROBLEMS WORLDWIDE.

## JURY

**Thomas Fisher**, ASSOC. AIA, Dayton Hudson Chair in Urban Design, University of Minnesota School of Architecture, College of Design, and director, Minnesota Design Center, Minneapolis

**Bryan C. Lee Jr.**, design director, Colloqate, New Orleans

**Carol Ross Barney**, FAIA, design principal, Ross Barney Architects, Chicago

Now in its fourth year, The Studio Prize celebrates excellence in design education by recognizing thoughtful, ethical studio courses from accredited architecture schools. The students enrolled in the winning courses receive a cash prize from a \$25,000 purse furnished by the program's exclusive sponsor, Sloan. Every year, a studio with a focus on sustainability, specifically water conservation, is singled out as the winner of the Sloan Award. This year's jury selected six winning studios, each of which exemplifies design's capacity to improve society.

The Studio Prize awards program is proudly sponsored by Sloan.

**SLOAN**

## The Malawi Studio: Resilient Health Care Infrastructures in Low-Resource Settings Thomas Jefferson University, College of Architecture and the Built Environment

### Studio Brief:

In this fifth-year undergraduate thesis studio, students conducted five weeks of intense, quantitative research to understand issues facing the health care sector in Malawi. Using the resulting data, they developed detailed design solutions to specific challenges such as an increasing demand for pediatric care in rural areas and how to respond safely and effectively to traffic accidents in congested cities.

### Investigation:

Chris Harnish, an associate professor of architecture at Thomas Jefferson University in Philadelphia, witnessed firsthand the challenges confronting Malawi's impoverished, overburdened health care sector when he spent a year teaching at the Polytechnic at the University of Malawi in 2017. The country, one of the poorest in the world, expects its population to double over the next 30 years, putting pressure on a medical system already near crisis. Harnish became convinced that architecture has a role to play in response.

But in planning the studio, Harnish decided that design had to take a back seat to data—and lots of it. Students spent much of their semester looking at energy use, disease rates, and other quantitative metrics of Malawi's health care system in order to understand specific problems, which then shaped their design solutions. "I joke that I wanted students to research for 13 weeks and design for two," Harnish says.

The actual research took about five weeks, but it's hard to miss Harnish's point: It can be tempting for design professionals to jump to aesthetically compelling solutions without first investigating the cultural and economic context of the problem, an issue that compounds when that context is a low-resource country.

Harnish's evidence-based approach helped his students to avoid imposing developed-world design typologies where they might be entirely inappropriate—for example, an air-conditioned, energy-intensive hospital like those in the United States would simply not work in a country where power supplies are unreliable and generators are often too expensive to maintain.

The jury found Harnish's approach compelling: "The idea that one can deal with a complex system like health care, break it down into its component parts, and look at the impact of those component parts both from a data condition and architectural condition, was well done," said juror Bryan C. Lee Jr. "That's what you want out of students at that level."

One student focused on the problem of pediatric care in Malawi, where the skyrocketing birthrate is straining rural resources. The resulting proposal, a model clinic, spends more time on an evidence-based plan for patient flow—how to separate sick from healthy patients, how to reduce wait times—than it does on the form of the clinic itself.

And that's just fine with Harnish: "Deep down, I'm least interested in design artifacts," he says. "If you have a compelling design method, the design proposal is the easy part."

### Studio Credits

*Course:* The Malawi Studio: Resilient Health Care Infrastructures in Low-Resource Settings

*School:* Thomas Jefferson University, College of Architecture and the Built Environment

*Level:* B.Arch., Year 5

*Duration:* Fall 2018 semester

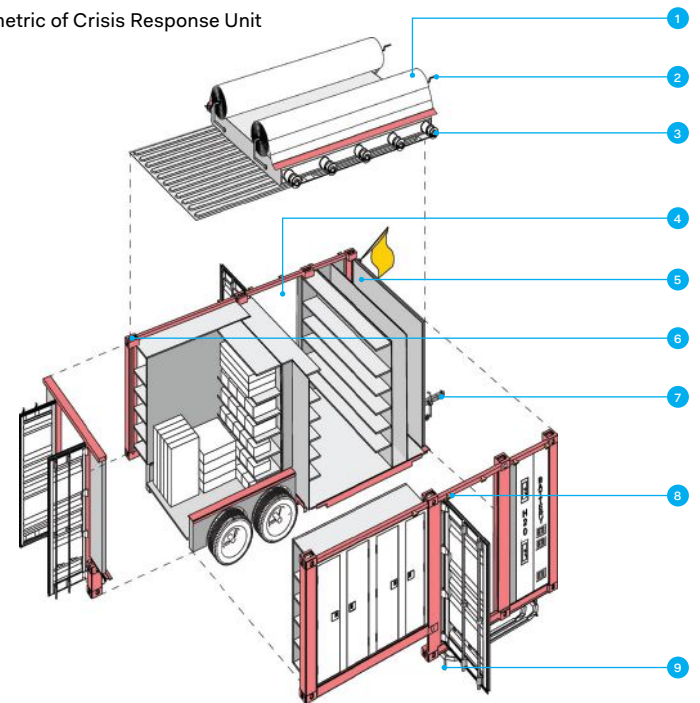
*Instructor:* Chris Harnish (associate professor of architecture)

*Students:* Ryan Elizabeth Clark, Benjamin M. Manarski, Hardi D. Shah (submitted work); Anna J. Ayik, Raymond R. Bracy, Annamarie Brecht, Sergio E. Claure, Modibo Coulibaly, Danielle M. Felicione, William M. Ferrill, Adriana Hernandez Palomino, Brandon S. Hodge, Rachel Meier, Madison N. Menard, Alexandra P. Noll, Pace K. Pace, Tyler K. Rota, Rachel B. Updegrove





Axonometric of Crisis Response Unit



### Crisis Response Units: Addressing Road-Traffic Injuries in Malawi

In developing countries like Malawi, rapid adoption of motor vehicles can lead to a rapid increase in related injuries. The number of patients treated rose more than 60% between 2009 and 2015, and is likely to double again by 2030. In response, Hardi Shah developed a proposal for a Crisis Response Unit—a mobile triage trailer that can get treatment to patients at the site of major road accidents. Supplies are easily accessed via wide aisles lined with shelves, double doors allow for easy loading and unloading, and deployable PVC canopies provide triage areas that receive natural light, but are shielded from the elements.

1. Deployable PVC fabric canopy
2. Lever to crank fabric back into roll
3. Rod connecting telescopic members
4. 3'-wide walkable space
5. Aluminum-plate walls
6. Structural corner joints fabricated using shipping container corners
7. Trailer hitch
8. Floodlights
9. Folded stands for stability

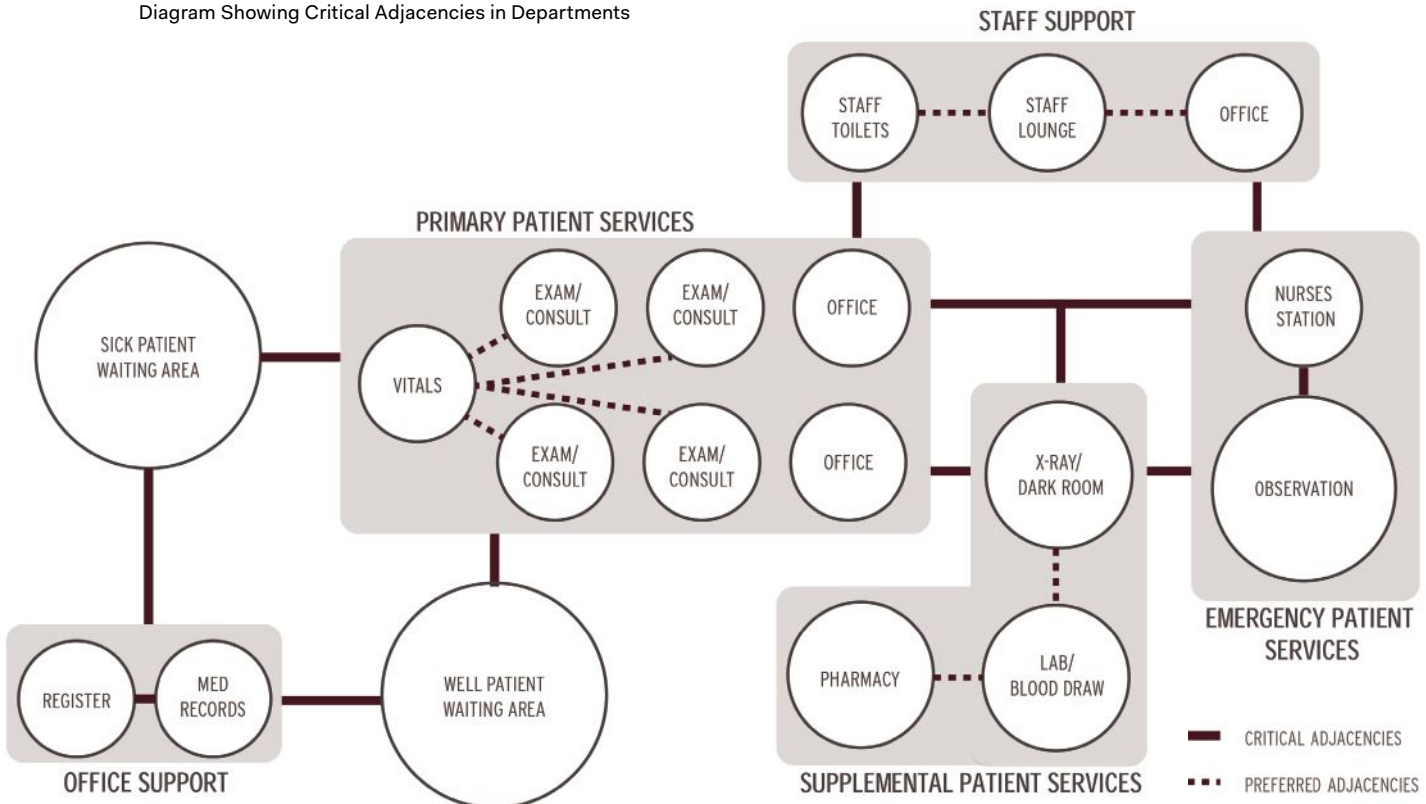
Section Diagram Showing Customized Environment



**Pediatric Care Models and Infrastructure: Introducing U5 Clinics to Dense Rural Malawi Populations**

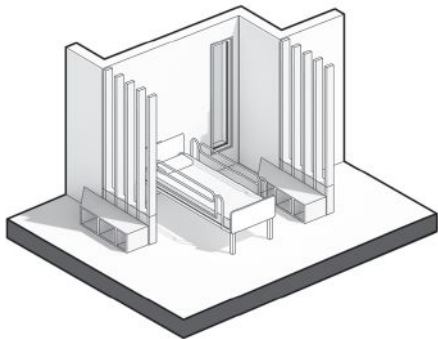
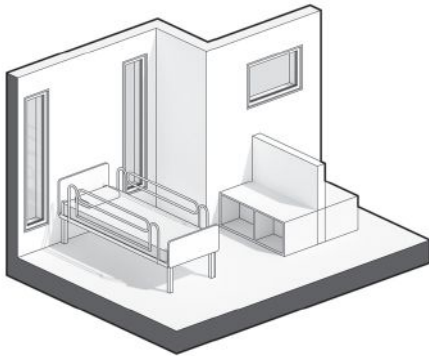
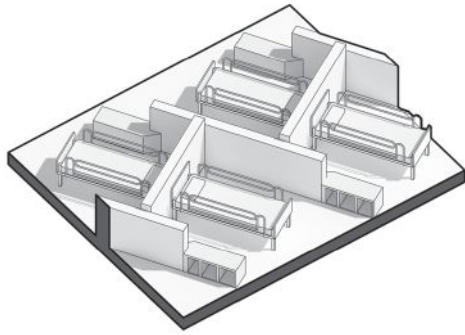
Ryan Elizabeth Clark’s research centered on pediatric care in rural Malawi, where rapid population growth is leading to inefficiencies and gaps in existing preventative care resources, particularly in dense rural areas. Clark analyzed ways to control the flow of patients—both sick children seeking treatment and well children seeking preventative care. Examining the critical and preferred adjacencies of each medical department, Clark developed a proposal for a clinic prototype that combines prefabricated assemblies with customizable finishes that can be deployed strategically in rural regions to improve access to pediatric care. The research showed that customizing each clinic to its specific regional context with local fabrication and art throughout (above) is critical for both the success of the enterprise and the acceptance of preventative pediatric care in each area.

Diagram Showing Critical Adjacencies in Departments

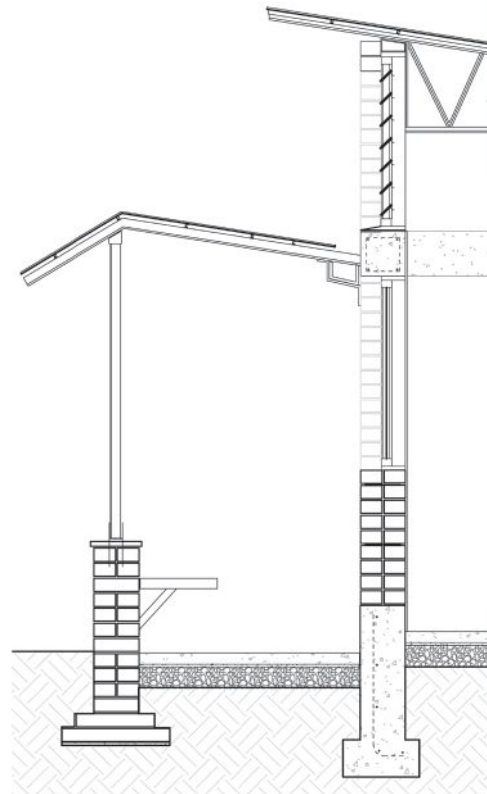
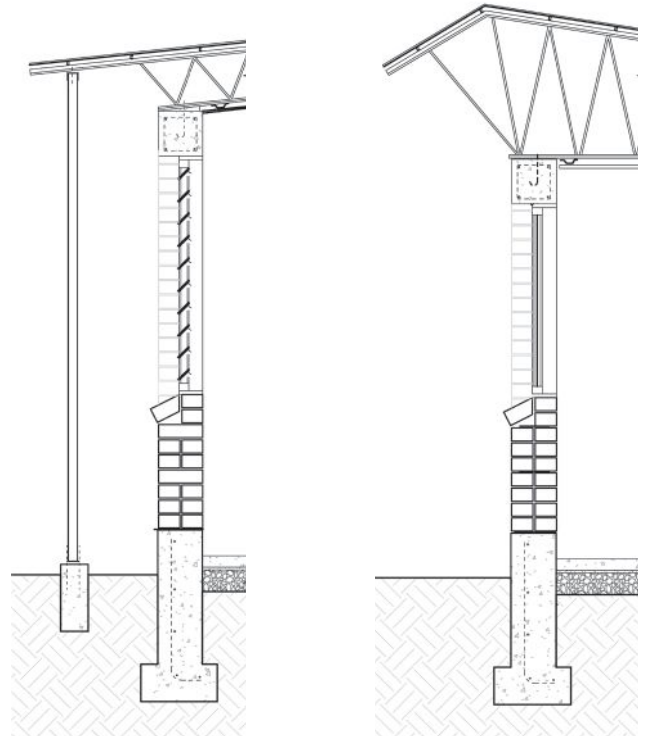




## Unitized Solutions to Maximize Daylight, Ventilation, and Privacy



## Sectional Assembly Diagrams



### Types and Applications: Open-Ward Design Research in Malawi's Health Care Infrastructure

The majority of health care facilities in Malawi feature an open-ward design, in which patients occupy a shared space. In the case of infectious diseases, such configurations can have negative health outcomes on patients in the ward. Benjamin Manarski studied the deficiencies in existing conditions and proposed a series of design guidelines centered around critical issues of ventilation, daylight, and organization and safety. Manarski developed solutions for the unitized level of each patient area (above), sectional assemblies (right), and ward layouts to find ways to maximize clean air, light, and security in both new construction and retrofits.

# USING DESIGN AS A CATALYST

## Bridging the Gap Studio

University of Maryland, School of Architecture, Planning, and Preservation and Al-Nahrain University, College of Engineering, Architectural Department

### Studio Brief:

With participation from 11 students in Maryland and 12 students in Baghdad, this collaborative, cross-institutional studio focused on neighborhood-level urban planning as a way of improving cross-cultural understanding. Groups of students at the two participating schools began with a rigorous analysis of a specific site in their own country's capital city. After compiling the research, the two groups of students swapped sites, and designed small- and large-scale redevelopment plans for the other country's capital.

### Investigation:

As the practice of architecture becomes ever-increasingly global, design professionals need better tools for working across countries and cultures. That's the idea behind Bridging the Gap, a joint studio between the University of Maryland's School of Architecture, Planning, and Preservation and the Architectural Department at Al-Nahrain University's College of Engineering in Baghdad. The studio was created with the support of Gensler, which hosted review sessions and offered internships to the top students from each school.

"The studio's main goal was to bridge the gap between cultures," says Shaimaa Hameed Hussein, an assistant professor at Al-Nahrain University who taught the Iraqi arm of the studio. "Students learn extensively about each other's culture and place, and are introduced to new ways to seek architectural solutions."

The studio began with students at each school researching a commercial neighborhood in their respective capitals: the Karrada District in Baghdad and the K Street corridor in Washington, D.C. The teams zeroed in on the conditions and challenges facing their respective sites: The Karrada District has suffered numerous terrorist attacks but remains a lively nighttime destination, while K Street is congested with workers during the day but empties out after hours.

Each team presented their findings to the other during a daylong video conference, after which they developed small-scale "tactical urbanism" interventions for each other—a place for street vendors along K Street, for instance, or a Ferris wheel along the Tigris River.

"The idea that a studio would cross these cultural barriers, and the fact that architecture could be a way to help cross-cultural understandings between two countries that have been at odds with each other, is amazing," said juror Thomas Fisher.

The students did further research on each other's sites, drawing on their new colleagues for local expertise, before proposing master redevelopment schemes. The Maryland students, in their plan for the Karrada District, focused on creating safe pedestrian spaces along main roads and the Tigris riverfront, while the Al-Nahrain students focused on adding residential towers, green spaces, and skywalks along K Street to bring new domestic life to the commercial neighborhood.

The students ended up learning as much from each other as from their instructors, says Maryland professor and studio leader Madlen Simon, AIA. "They were able to make a clear connection between what they were doing in the studio and what they would do in practice if they go to work for a big multinational firm."

### Studio Credits

*Course:* Bridging the Gap Studio  
*School:* University of Maryland (UMD), School of Architecture, Planning, and Preservation; Al-Nahrain University, College of Engineering, Architectural Department  
*Level:* First Year (M.Arch., Year 2) UMD and Al-Nahrain students; Third Year (M.Arch., Year 3-5) UMD students  
*Duration:* Spring 2019 semester

*Instructors:* Madlen Simon, AIA (professor and associate dean for academic affairs & outreach, University of Maryland); Jassim Aldabbagh (professor, Al-Nahrain University, Architectural Department); Shaimaa Hameed Hussein, Mohammed Kassim (assistant professors, Al-Nahrain University, Architectural Department)

*Students:* Rachel Cain, Tochi Ohakawa, Gijoon Paris Sim, Heba Amer Dawood, Aisha Alaa Salih, Kabas Abdul Hameed Salman (submitted projects); Jessica Ham, Matthew Rismiller, Victoria Urdaneta, Amanda Sparks, Jared Schmitz, Mansoor Ahmed, Hannah Grady, Wil Combs, Eiman Mohammed Musawi, Rayya Aqeel Abdul Zahraa, Thoraya Sajid Shakir, Shams Qais Abdullah, Samer Qais Ibraheem, Zahraa Mohammed Obayes, Noor Faraj Ismaeel, Mohammed Noori Yousif, Harith Thaeer Raad



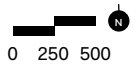


**Hackable City**

Heba Amer Dawood, Aisha Alaa Salih, and Kabas Abdul Hameed Salman from the Architectural Department in Al-Nahrain University's College of Engineering developed a proposal to play on the strengths (proximity to the National Mall and access to transit) and address the weaknesses (lack of residential population and amenities for area workers) of Washington, D.C.'s K Street corridor. Their scheme includes increasing residential and hotel density in the area, and linking existing public spaces with pedestrian bridges (above and right) to create new strata of activity and pedestrian access in the neighborhood.

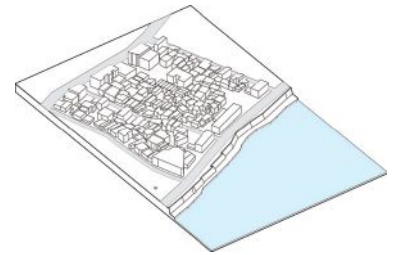


Site Plan

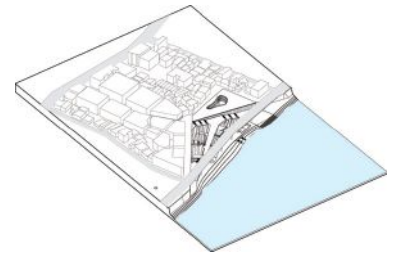




Existing Conditions



New Waterfront



### Karrada District Design Center

University of Maryland (UMD) student Gijoon Paris Sim developed a proposal for a new design center that would reconnect a bustling Karrada commercial district to the Tigris River. Currently, a major road cuts off access to the waterfront, but in this scheme, a terraced park and series of plazas would allow easy pedestrian access to the river and provide a safe gathering spot for residents (top). At the heart of the development sits a flexible gallery building (above) that connects at every level to the new public plazas.



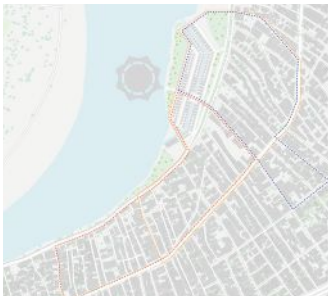
### Redevelopment of Karrada District

To reimagine the edge of the Tigris River in Baghdad's Karrada district, UMD students Rachel Cain and Tochi Ohakawa sought to capitalize on existing strengths (high pedestrian traffic and diverse amenities) and address weaknesses (a lack of public outdoor space and hazardous street crossings). Their proposal includes a new pedestrian pier with recreational space and activities such as a Ferris wheel, diverting traffic underground to improve traffic flow and make the streetscape more pedestrian friendly, and bringing new residences to the area.

Existing Conditions



Proposed Bus Route



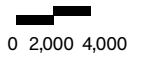
Proposed Pedestrian Roads



Proposed Parking



Proposed Buried Road Land Use



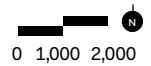
Proposed Commercial District



Proposed Canal Land Use



Proposed Boat Route



# RETHINKING THE INFRASTRUCTURE

**The Yamuna River Project: Re-Centering New Delhi, A Piece of the City**  
University of Virginia, School of Architecture

## Studio Brief:

Each year, professors at the University of Virginia run a one-semester studio focused on a different urban planning challenge in New Delhi. The latest course looked at the city's main river, the Yamuna. After extensive research and a weeklong trip to the region, students developed individual projects around the river, which were then integrated into a single master plan.

## Investigation:

For seven years, students at the University of Virginia have been stitching together a patchwork of master plans for the sprawling megacity of New Delhi. Each semester-long studio, co-taught by professor Pankaj Vir Gupta and lecturer María González Aranguren, drills down on a particular geographic or socioeconomic aspect of the capital.

The most recent studio, involving 13 students, focused on a 24-kilometer stretch of the Yamuna River, which bisects the city and provides both its drinking water and its sewage drain. The students divided into teams to research different aspects of the river, including its uses, its impact on health, and the housing stock surrounding it.

After several weeks of research, the students traveled to New Delhi, where they met with local political and community leaders; along the way, they saw how well—or how little—their classroom learning tracked with the real world. “They go to India with a lot of knowledge, and then they often have to forget it,” Aranguren says.

Back in Charlottesville, Va., each student chose a particular aspect of the research to develop into a project proposal—for example, one designed a plan to better handle sewage from nearby housing blocks, while another developed a scheme to reintroduce small-scale agriculture to the Yamuna flood plain. Finally, the class combined their projects into a master plan for the river—which is integrated with the previous semesters' work.

The blend of intense research informed by personal interaction with the site impressed the judges, as did the studio's growing database of master plans. “This is the kind of thing we hope students are doing,” said juror Thomas Fisher. “They are doing relevant, culturally grounded work that is advancing our thinking in a number of areas.”

And whether they ever pursue a project in a city like New Delhi or not, the experience, Gupta says, will make them better architects: “This very deep, real engagement with the world will allow them to feel comfortable no matter where they end up on their career path.”

## Studio Credits

**Course:** The Yamuna River Project: Re-Centering New Delhi, A Piece of the City

**School:** University of Virginia, School of Architecture

**Level:** M.Arch. (with pre-professional degree in architecture), Year 2; M.Arch. (without pre-professional degree in architecture), Year 3; Master of Landscape Architecture, Year 2, 2.5, and 3; B.S. in Architecture, Year 4; Master of Urban + Environmental Planning, Year 2. (The studio is a research or advance studio offered to students in their last semesters of bachelor's or master's degree.)

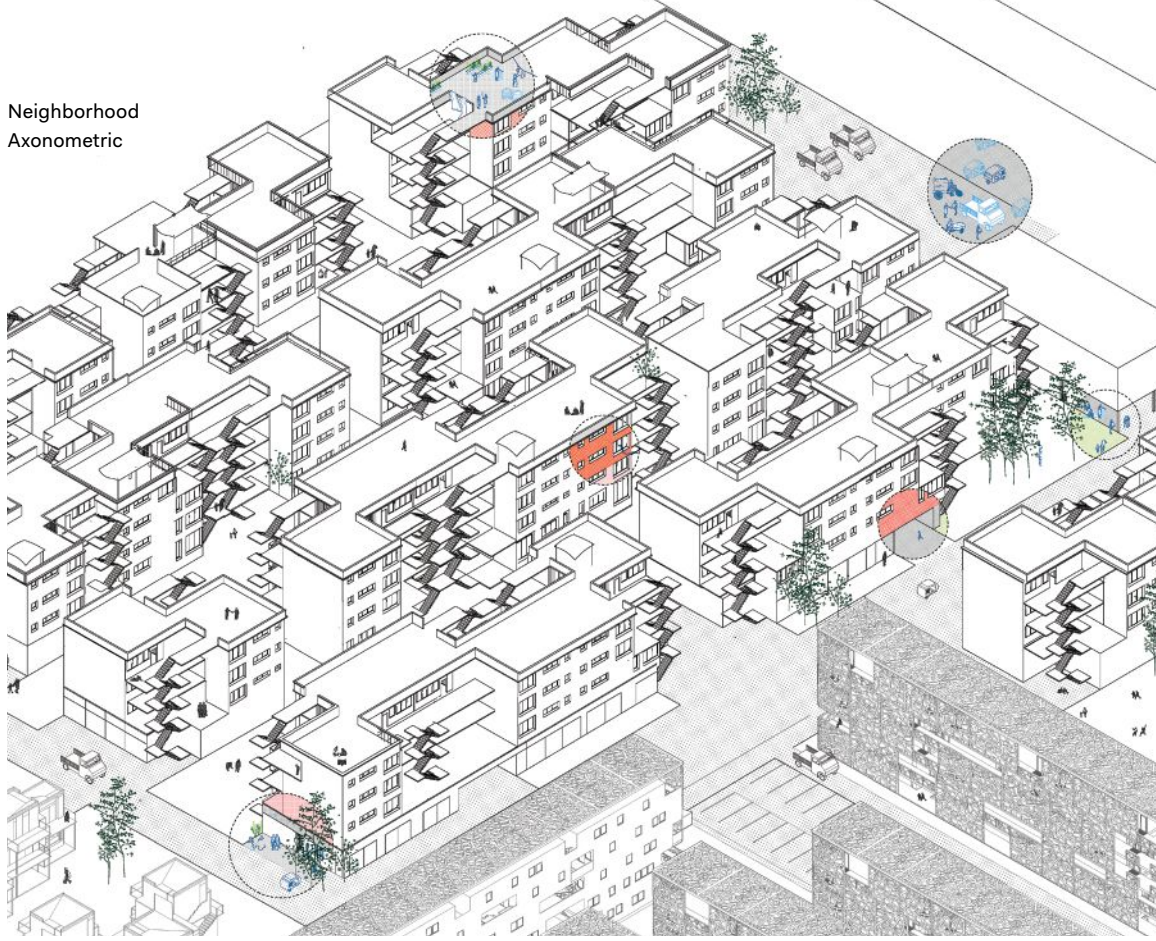
**Duration:** Fall 2018 semester

**Instructors:** María González Aranguren (lecturer of architecture); Pankaj Vir Gupta (professor of architecture)

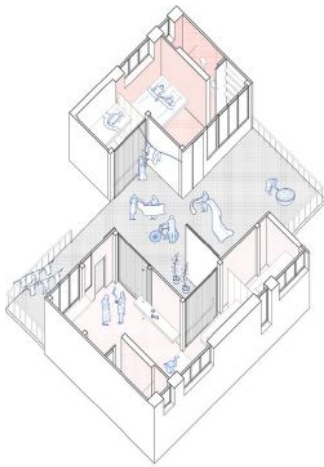
**Students:** Darcy Engle, Katherine Rush, Jing Huang, Hangyu Shi, Christian Kochuba, Cong Nie, Gene Louise Kimberly Corral, Jonathan Chu, Yousef Almaná, Yasmin Ben Ltaifa, Andrew Helmbrecht, Kristen Von Bampus, Mennen Middlebrooks (work submitted)



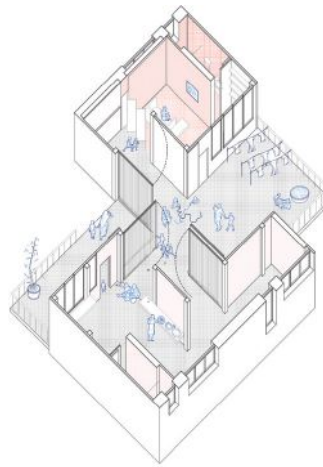
Neighborhood  
Axonometric



Clear Boundary Between Private  
and Shared Space



Combining Shared Space to  
Maximize Floor Area



Expanding Private Space



### Mixed-Use Social Housing for the Yamuna

Katherine Rush's proposal rethinks high-density residential typologies in the region, proposing a user-controlled "gradient of privacy" that can change over the course of each day (above). An analysis of existing low-income housing in New Delhi showed that many residents of dense slums live with only 1 to 5 square meters of space per person. With stackable furniture, movable partitions, and terraces and courtyards shared by neighbors, this model provides 8 to 10 square meters per person, while giving residents more agency over their surroundings.

## Vertical Bathroom/Bath House Section

Vertical Bathroom/Bath House Axonometric

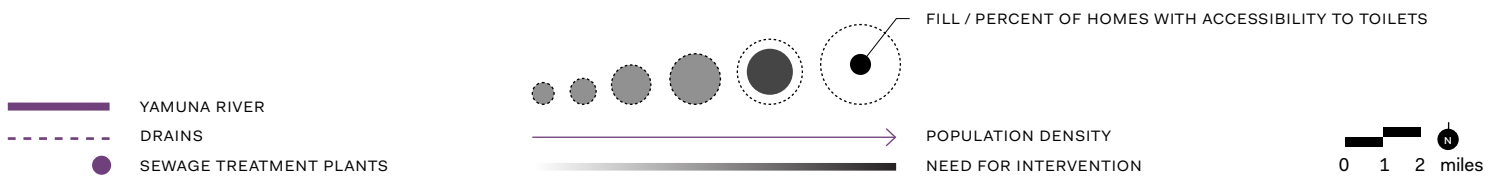
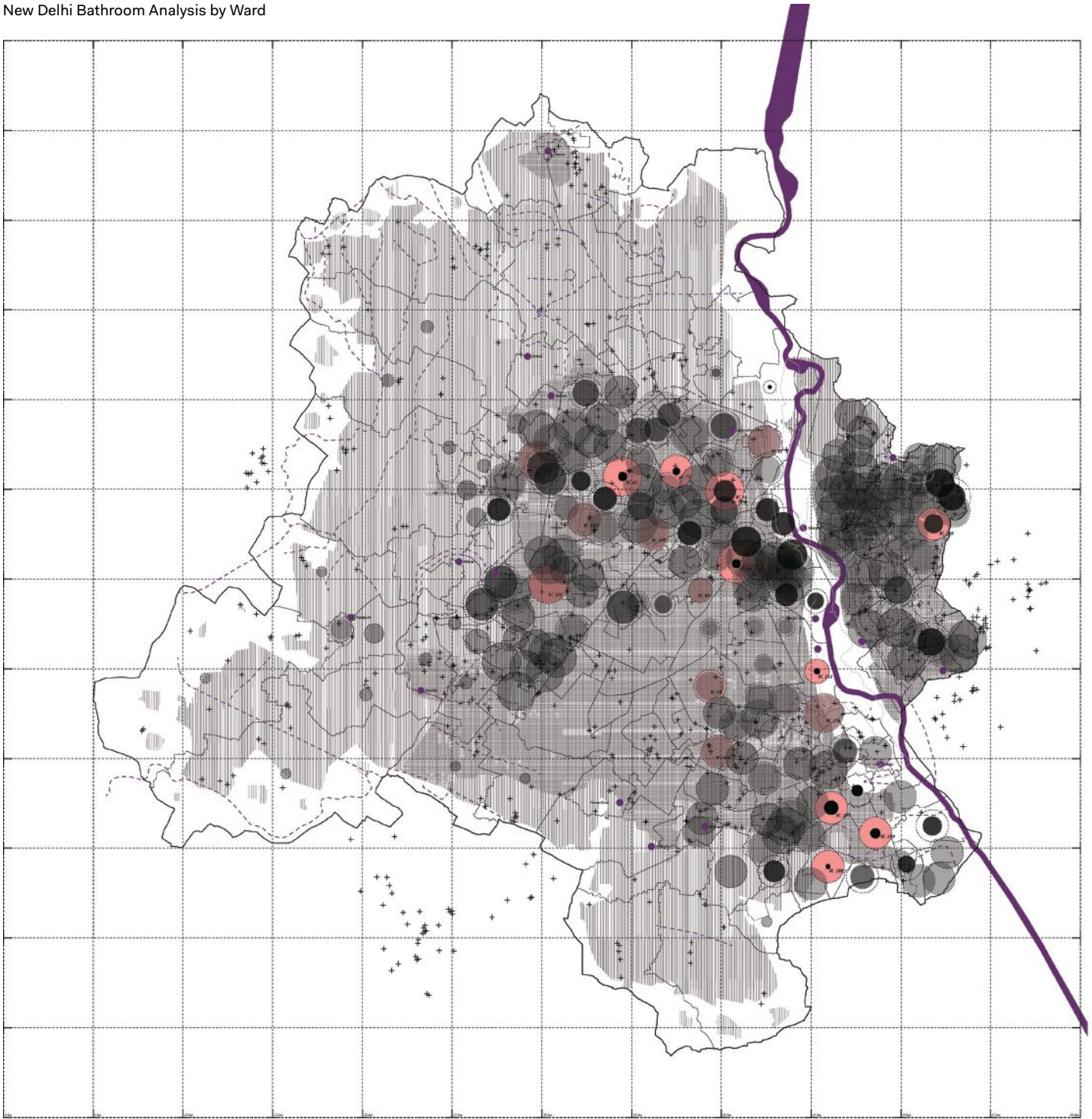


### Approaching Sanitation: A Typological Response to the Study of Sanitation Infrastructure in New Delhi

A lack of bathroom infrastructure means that one of the main contaminants of the Yamuna River is fecal matter. Students analyzed the bathroom infrastructure in the region (opposite), comparing population density with the percentage of homes with toilet access to determine areas that most need intervention. With that information, Darcy Engle developed proposals ranging from rooftop facilities, to community towers that accommodate toilets and areas for bathing and laundry (above and right), to large public facilities that serve as community catalysts, incorporating retail and child care.



New Delhi Bathroom Analysis by Ward

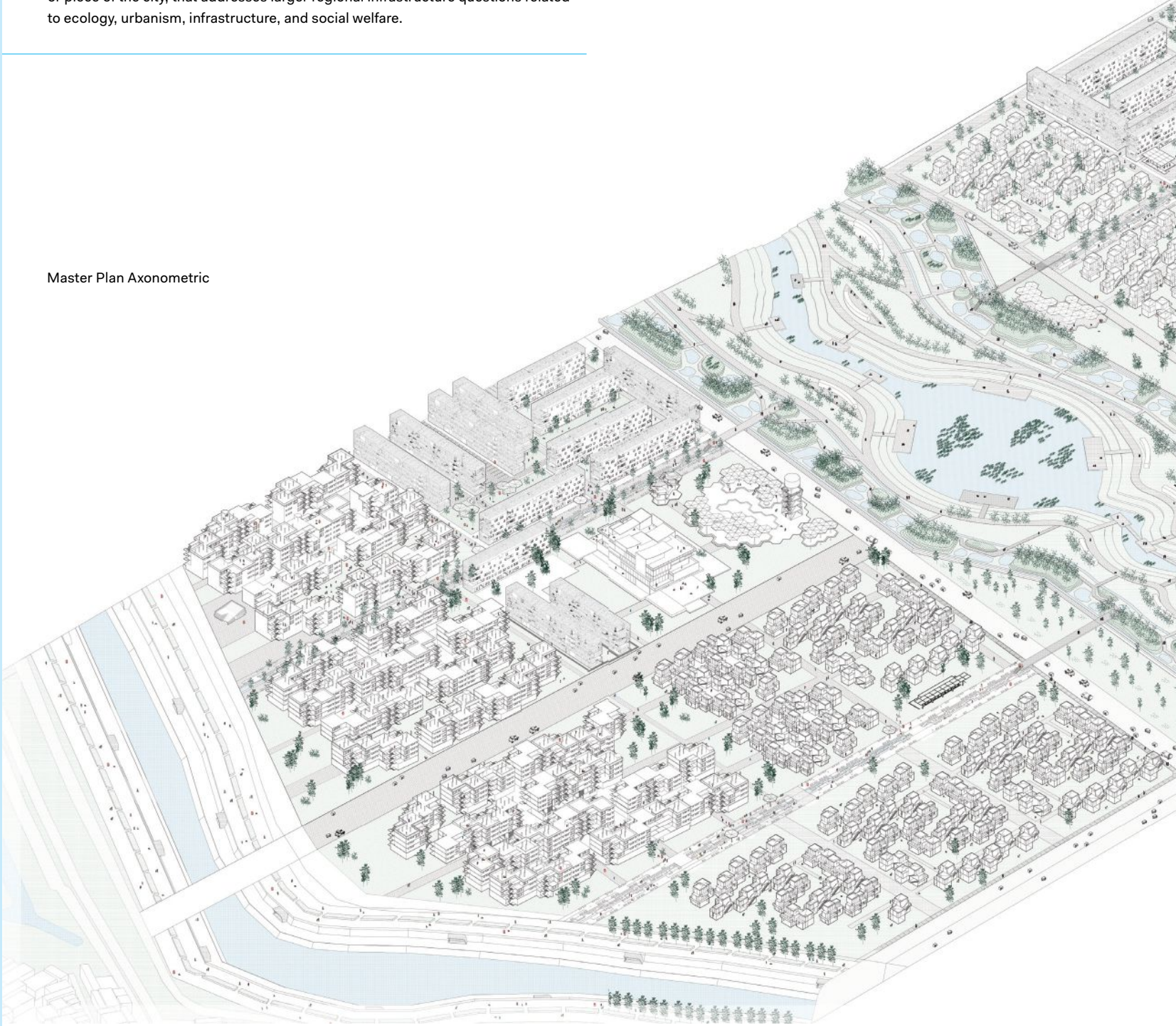




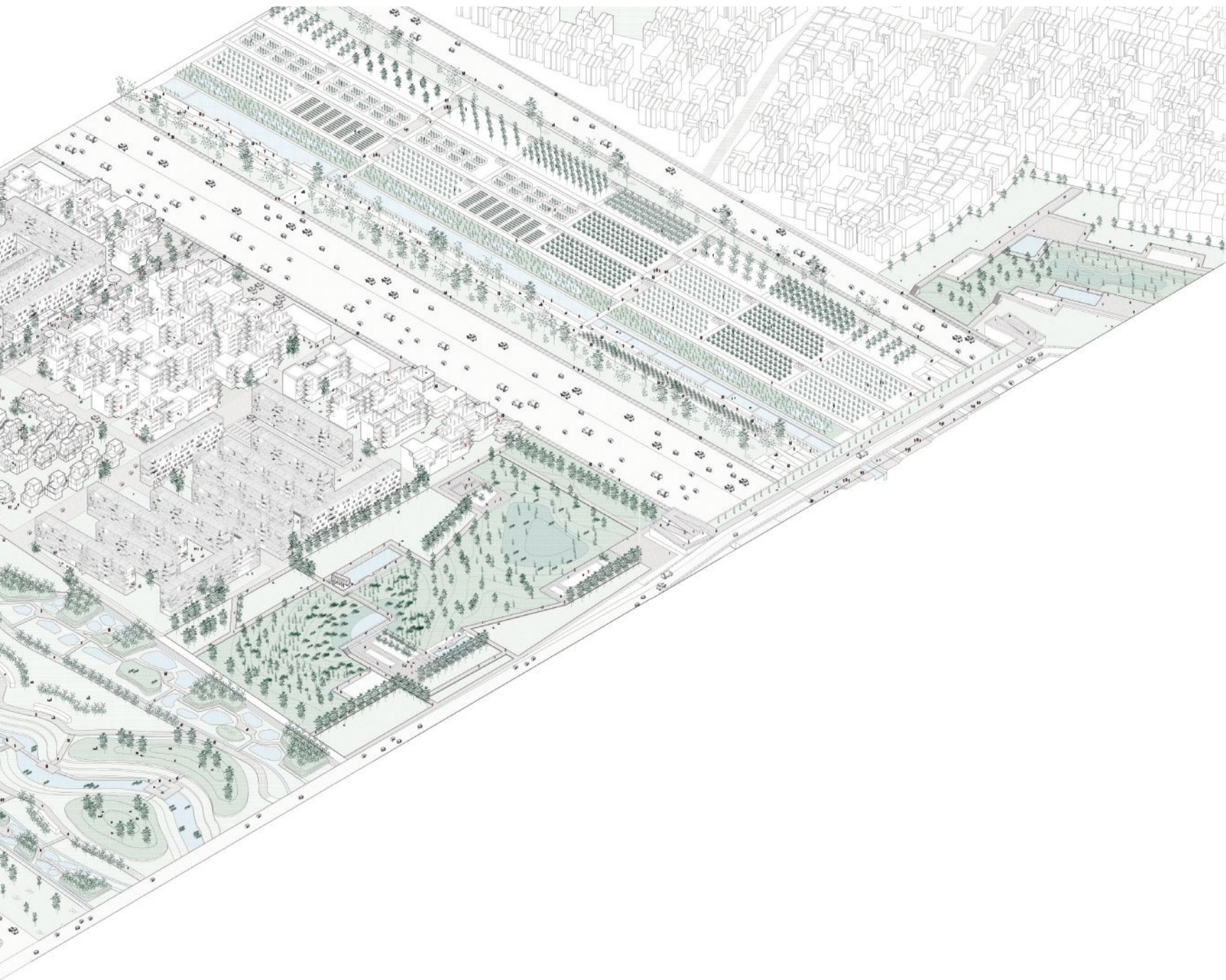
### A Piece of the City: Re-Centering New Delhi and the Yamuna River

Each of the individual student proposals were combined into a single master plan, or piece of the city, that addresses larger regional infrastructure questions related to ecology, urbanism, infrastructure, and social welfare.

Master Plan Axonometric







**Architecture Design Studio 8**  
**Kansas State University, College of Architecture, Planning & Design**

**Studio Brief:**

This yearlong thesis studio required students to perform an intensive research program on the Albaicín neighborhood in Granada, Spain, which has been a locus for African migrants. The students visited Spain to better understand the impact of migrant resettlement, and then developed design solutions to health, education, and integration challenges faced by Spain's migrant community.

**Investigation:**

As the European country located closest to Africa—and one of the few to maintain a relatively open border—Spain has seen its migrant population increase rapidly in recent years. Southern cities like Granada have struggled to provide vital services to new arrivals, many of whom bring with them severe emotional and physical trauma.

Fourteen students at Kansas State University tackled this problem through a combination of intense research and on-site exploration. Working with a visiting professor from Spain, Fuensanta Nieto, HON. FAIA, the students developed initial design concepts that would serve the migrant community and encourage a smoother transition to their new environs—including those for a counseling center, a cultural space, and an artisan workshop. To inform the proposals, the students spent several weeks researching every facet of the country's migrant situation.

In the late fall, they took a two-week trip to Spain, including a week in Granada, where they were able to compare their research findings with real-world conditions—an experience that challenged their initial

assumptions about the site in Granada, and caused many to rethink their original projects. Back in Manhattan, Kan., the students spent the spring semester refining and deepening their proposals, so that their final projects included detailed schemes—down to mechanical systems and construction budgets.

The jury felt that this mix of intensive research and design made for a set of projects that were not just attractive, but sensitive to a mounting humanitarian crisis. “They’re serving those who are disproportionately affected, not as a design solution, but as a form of caring and healing through architecture,” said juror Bryan C. Lee Jr.

Professor Wendy Ornelas, FAIA, who taught the studio, said the experience showed students the value of deep research, and the importance of marrying that information with a coherent and persuasive argument for their proposal. “They really had to understand the program, which taught them that they need to have a compelling story to tell clients,” she says. “If you don’t understand what you’re doing, you’re never going to sell anything as a professional.”

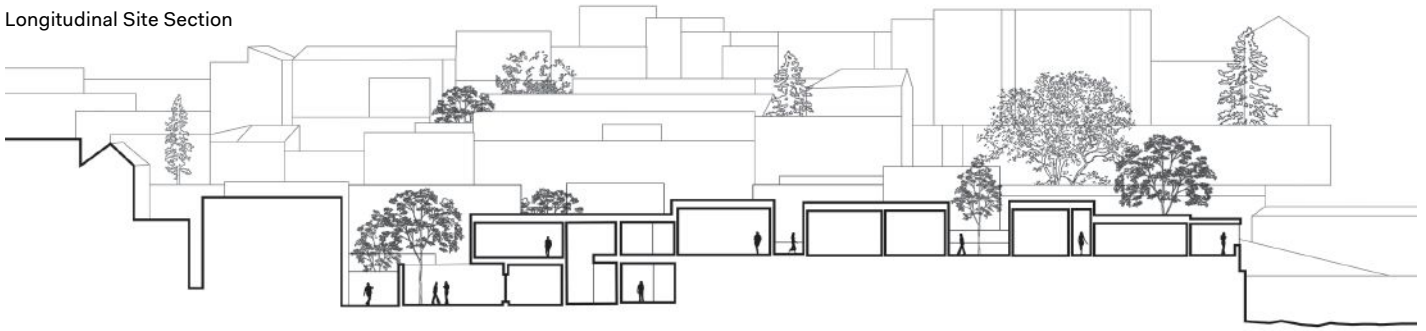
**Studio Credits**

*Course:* Architecture Design Studio 8 ARCH 807 | Design Communication ARCH 808  
*School:* Kansas State University, College of Architecture, Planning & Design  
*Level:* Non-baccalaureate M.Arch., Year 5  
*Duration:* Spring 2019 semester

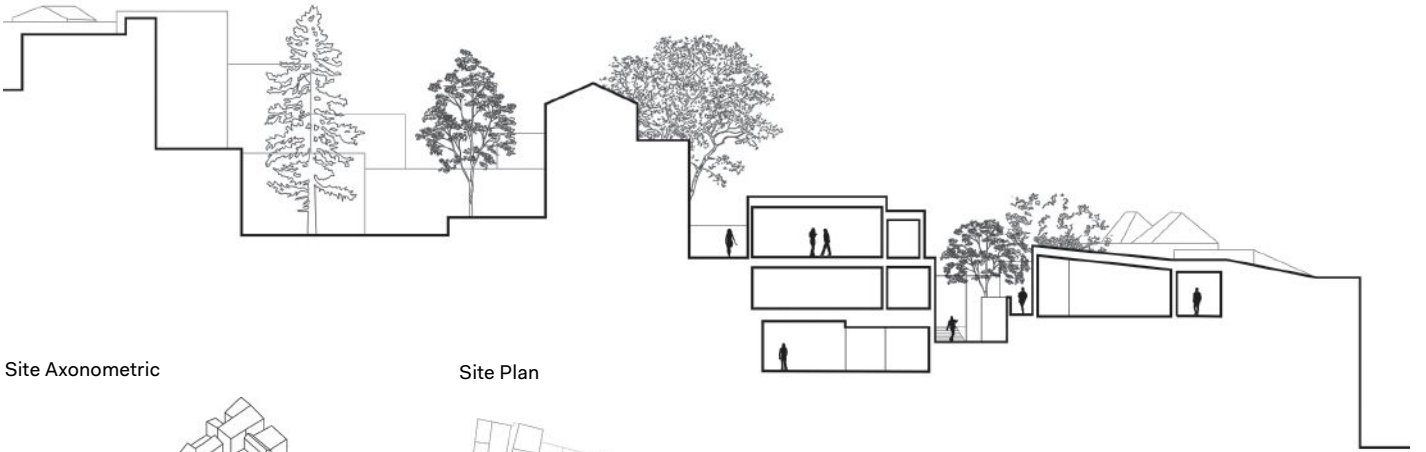
*Instructor:* Wendy Ornelas, FAIA (professor); Fuensanta Nieto, HON. FAIA (programming and studio guidance, Victor L. Regnier visiting distinguished professor); Elizabeth Amirahmadi, AIA, Chris Fein, AIA, John Shreve, AIA, Alfredo Baladrón (minor advisers)  
*Students:* Tara Bray, ASSOC. AIA, Niklas Carlson, Kasey Holle (student work submitted); Lauren Bailey, Kathleen Eberth, Morgan Gales, Tucker Glasse, Brandon Heide, ASSOC. AIA, Regan Kerfeld, Logan Medrano, Andrew Rash, Alexandra Wilson, Chandlor Wilson, Kathryn Zieno



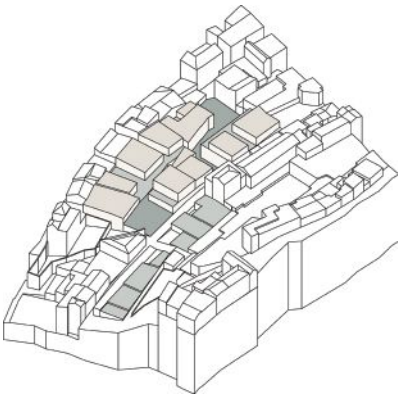
Longitudinal Site Section



Site Section



Site Axonometric



Site Plan

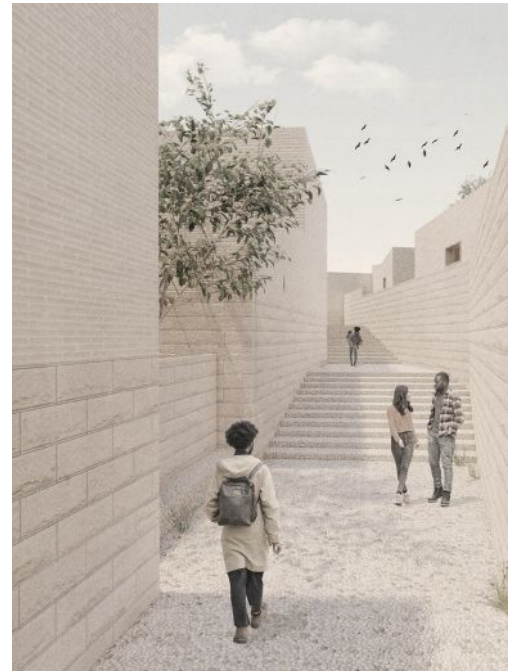


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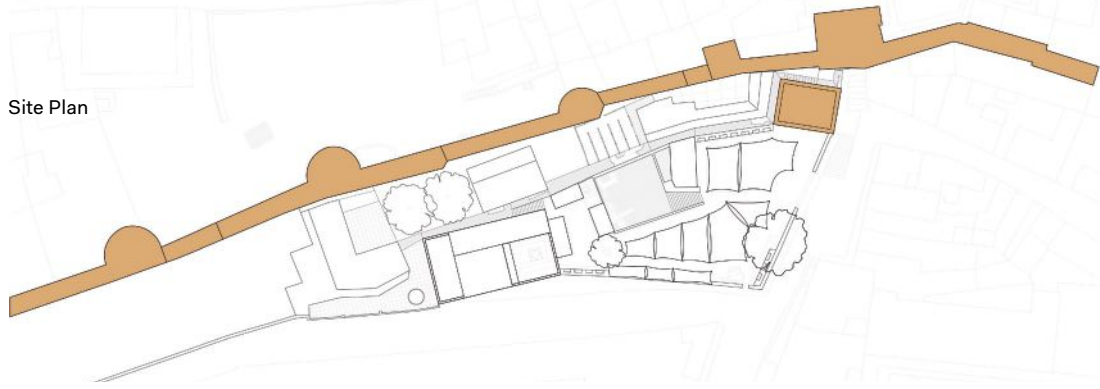
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### The Seed | La Semilla: A Center for Growth in Granada, Spain

Tara Bray's proposal is for a community center that serves as a touchstone for migrant populations as they assimilate to their new lives in Granada. The complex is designed to provide new arrivals with temporary housing, as well as private and group counseling and community services. There are also facilities for education and job training, as well as a network of community and healing gardens that offer sheltered outdoor space for recreation and food production. Designed using local materials, the facility is divided into smaller volumes that respond to the streetscape and surrounding context.



Site Plan



**Griot: A Cultural Space for Refugees**

A griot is a West African storyteller or oral historian, and Kasey Holle took inspiration from this tradition to develop a scheme for a cultural center in Granada where migrants from more than 10 countries can come together, share their cultures, and forge connections in their new home. Sited against an existing Roman wall, the center incorporates artisan spaces where migrants can make traditional goods and an open-air marketplace with canopies for selling them (right). The complex is dedicated as much to preserving culture as to finding a foothold in a new country.



Site Section



Site Section



Site Section





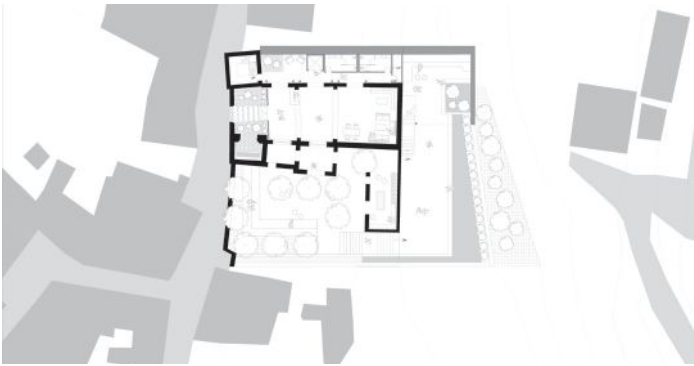
Section



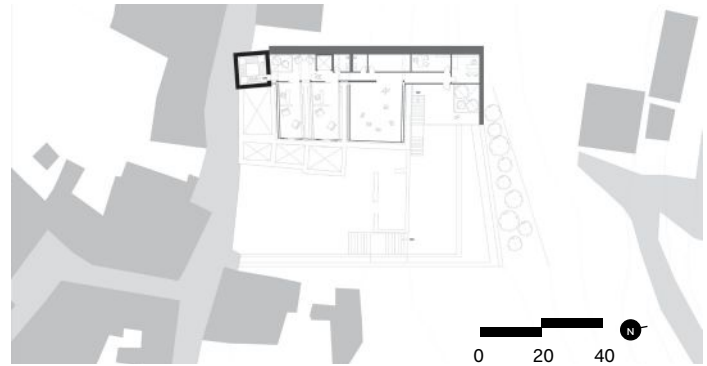
Section



First-Floor Plan



Second-Floor Plan



### The Sanctuary

Niklas Carlson's proposal focuses on the need for social services for arriving migrant populations. Sited in the ruins of a 16th-century church on the outskirts of the Albacín neighborhood, the Sanctuary provides spaces for counseling, meditation, and introspection in an environment that is removed from the bustle of the city. To preserve the integrity of the historic site, Carlson's scheme calls for new, self-contained volumes to be floated within, but physically separate from, the existing walls; a community hall is on the first floor would be topped by more private spaces such as those for private or group counseling (right).



# DEVELOPING GUIDELINES FOR HOMELESS VETERANS'

**Micro-Housing for Homeless and Disabled Veterans**  
NC State University, School of Architecture, College of Design

## Studio Brief:

At the request of a state-level homelessness prevention organization, this studio researched the possibility of co-locating micro-housing—free-standing residences of between 150 and 400 square feet—to form “villages” that provide shelter and support for homeless veterans.

## Investigation:

In early 2018, the North Carolina Coalition to End Homelessness approached the NC State University architecture school with a problem, and a request: On any given night, more than 800 veterans are homeless across the state. Would the school be willing to investigate ideas for low-cost, high-quality housing that would offer easy access to community and health services?

Thomas Barrie, AIA, a professor who runs the school’s Affordable Housing and Sustainable Communities Initiative, took up the challenge. Bringing together 11 master’s-level students, he and his co-instructor, professor David Hill, AIA, created a semester-long studio to examine existing solutions for affordable and supportive veterans housing, and to assemble a “playbook,” which the client could then use to guide future planning and construction efforts statewide.

The studio began with the students dividing into two-person teams, each of which spent a month researching questions about the needs and habits of homeless veterans, commonly used materials, and so forth.

From there, each student developed their own design, drawing on the expertise of two visiting design

professionals—Davin Hong, AIA, of Baltimore’s Living Design Lab, and Washington, D.C.–based Omar Hakeem, AIA, of bcWorkshop—both of whom have experience designing affordable micro-housing. Barrie also created an advisory committee composed of local homeless advocates, affordable housing experts, and designers who provided their own input as the students developed their projects.

“The studio reinforced for me the role that schools of architecture should play,” Barrie says. “Students should leave studios and programs like ours with a strong sense that architecture is a social art.”

Once the students left, Barrie and graduate assistant Alyssa Dohler compiled the student research and presentations into a 100-page book, which they delivered to the Coalition Against Homelessness in April 2019.

While the studio emphasized research over design, Barrie insists it is all part of the same whole. “Everything, even research, is design,” he says.

And the jury agreed: “It hits all the buttons it needed to hit,” said Carol Ross Barney. “It has interaction, it has social purpose.”

## Studio Credits

*Course:* Micro-Housing for Homeless and Disabled Veterans  
*School:* NC State University, School of Architecture, College of Design  
*Level:* Graduate and Senior Undergraduate  
*Duration:* Fall 2018 semester

*Instructors:* Thomas Barrie, AIA (professor of architecture, academy of faculty engaged in extension); David Hill, AIA (professor of architecture, chair of the School of Architecture)  
*Project Sponsor:* Terry Allebaugh (community impact coordinator, North Carolina Coalition to End Homelessness)  
*Project Research Assistant:* Alyssa Dohler (M.Arch. student)  
*Report Designer:* Katie Frobose (Master of Graphic Design student)  
*Visiting Experts:* Davin Hong, AIA, Omar Hakeem, AIA  
*Advisory Committee:* Andy Fox (associate professor of landscape architecture); David Harris (Wake County Human Services Housing Division); Mary Haskett (professor of psychology, CHASS); David Maurer, AIA (TightLines Designs); Lewis Sadler (Sadler Construction; Wake County Home Builders Association); Jeff Smith (NC Dept. of Health and Human Services); Abbie Szymanski (Partnership to End Homelessness)  
*Students:* Austin Corriher, Ross Davidson, Alyssa Dohler, Kal Fadem, ASSOC. AIA, Ryan Kilgannon, Elenor Methven, Justin McNair, Amelia Murphy, Scott Needham, ASSOC. AIA, Katie O’Campo, Nicole Simeonsson, ASSOC. AIA (work submitted)





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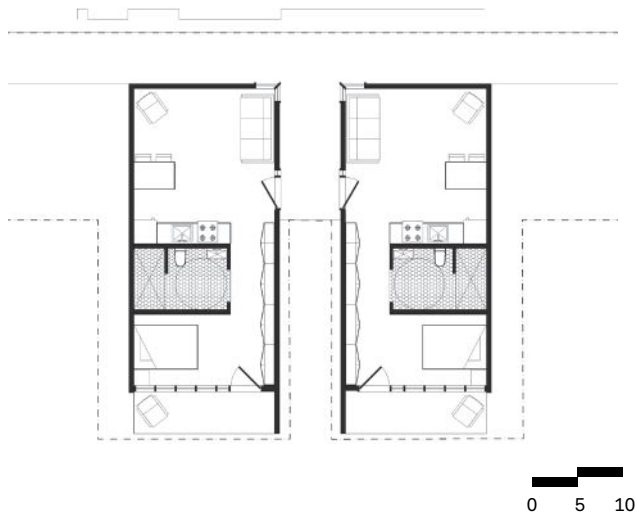
### Research and Engagement

Over the course of the semester, the 11 students conducted research into veteran homelessness and affordable supportive housing. Sponsored by the North Carolina Coalition to End Homelessness (NCCEH), the studio afforded students access to architects and designers who have worked on similar community designs, as well as to homeless activists. After conducting their research, the students worked individually and in teams to develop designs for micro-house village proposals, such as the one by Ross Davidson (above).

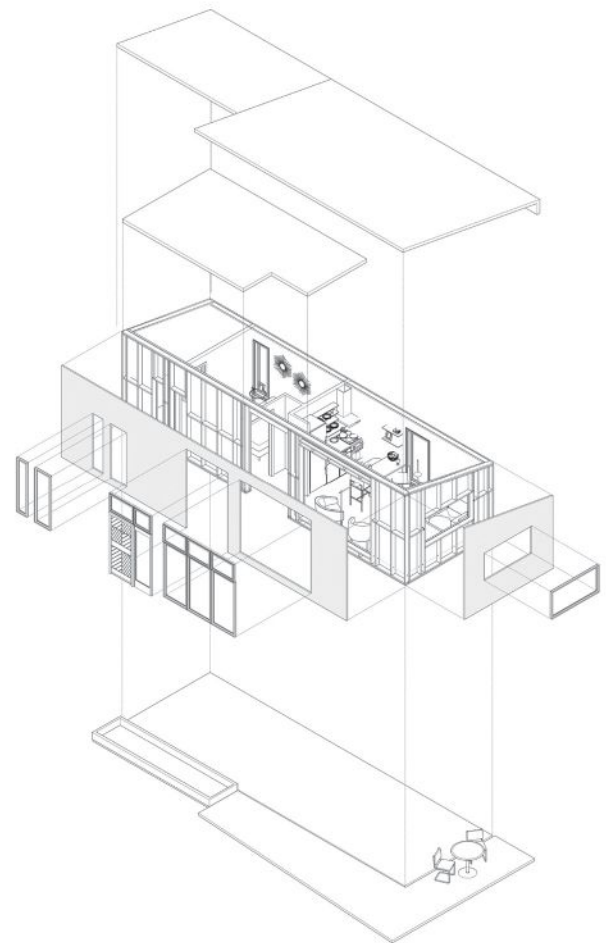
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Micro Unit 1 Plan



Micro Unit 2 Axonometric



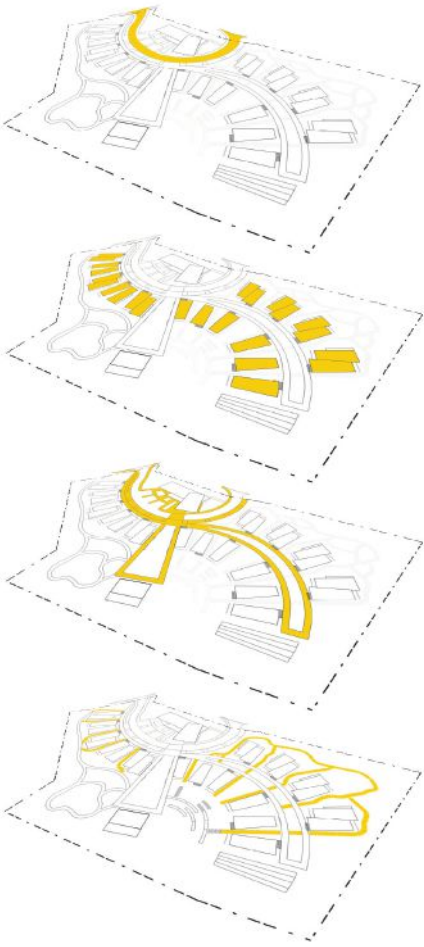
### Micro-House Village Designs and Report

Each village plan had to incorporate housing units, a community house with social services, and outdoor programming such as sports fields and gardens, and the students generated a variety of documentation, such as individual unit floor plans that address unit adjacencies, renderings, and site plans. Examples of that documentation are shown here, by students Katie O'Campo (right), Scott Needham (above and top), Austin Corriher (opposite top and middle right), and Amelia Murphy (opposite bottom left and right). The proposals and research were then compiled by the professors and graduate research assistant Alyssa Dohler into a 100-page report designed by Master of Graphic Design student Katie Froebse that will be used for raising awareness and fundraising by the NCCEH.





Site Diagram



# THE SLOAN AWARD

**Moving Mumbai: Urban Frameworks for Mumbai's Eastern Waterfront**  
**New Jersey Institute of Technology, Hillier College of Architecture and Design**

## Studio Brief:

Using an international design competition as a prompt, this studio for first-year master of infrastructure planning students and advanced undergraduates created a master plan for redeveloping a postindustrial stretch of the Mumbai waterfront. The resulting proposal, “Hydrohoods of Tomorrow,” imagines a series of mixed-use districts planned around efficient and equitable uses of the city’s dwindling supply of fresh water.

## Investigation:

Mumbai is the largest city in India, at 18.4 million people, and it is expected to add another 20 million, or more, by 2050. Planning for that growth, in particular along the city’s waterfront, was the focus of the 2019 Schindler Global Award, an international student design competition that became the basis for a one-semester studio at the New Jersey Institute of Technology. (Several students continued developing the scheme after the studio ended, and ultimately, it took fourth place in the competition.)

The studio focused on the city’s eastern waterfront, a once-bustling port area that fell into disuse after more-modern, container-based facilities opened elsewhere in Mumbai. Professor Georreen Theodore, AIA, who led the studio, first had to train her 14 students to think at such a large scale, and to gather information on everything from Mumbai’s ecology to its government structures and politics. “That would be a big challenge for even the most seasoned professional,” Theodore says.

In the second half of the studio, the students worked together on a single master plan. They divided it

into five “hydrohoods,” or mixed-use areas built around the collection, filtration, and reuse of water supplies at the neighborhood level. Parkland, interwoven among apartment blocks, provides open space for residents and rainwater catchment, while a shoreline mangrove forest provides a buffer against rising water levels.

“This is a visionary and systemic project that is not utopian,” said juror Thomas Fisher.

Part of what made the plan appealing was the work the students put into “selling” it to residents and developers. Since the hydrohood model might take decades to realize and would disrupt thousands of homes and businesses in the process, the students developed an advertising campaign to explain the project, as well as a narrative that relates the daily life of a hydrohood through the life of a young girl.

For Theodore, that exercise was about more than marketing—it forced students to think about their master plan at both the macro and the individual level. “I wanted them to see that the practice of architecture and urban design is interscalar,” she said.

## Studio Credits

**Course:** Moving Mumbai: Urban Frameworks for Mumbai’s Eastern Waterfront

**School:** New Jersey Institute of Technology, Hillier College of Architecture and Design

**Level:** Master of Infrastructure Planning (MIP), Year 1

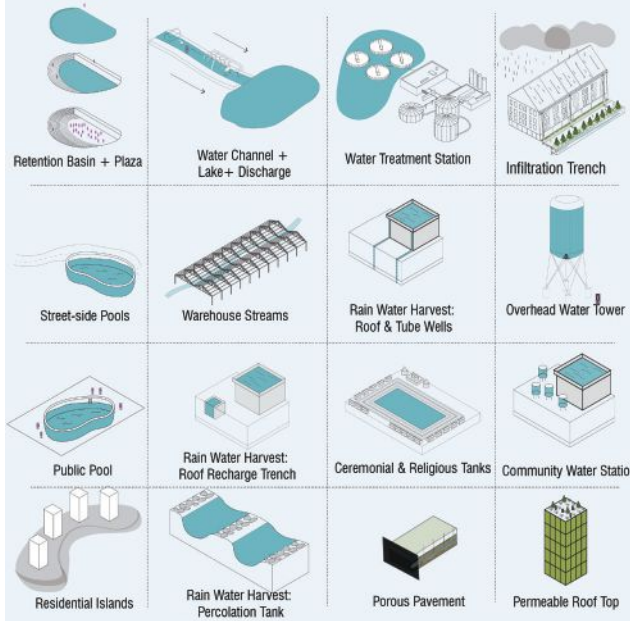
**Duration:** Fall 2018 semester, plus independent study

**Instructor:** Georreen Theodore, AIA (professor, program director of master of infrastructure planning)

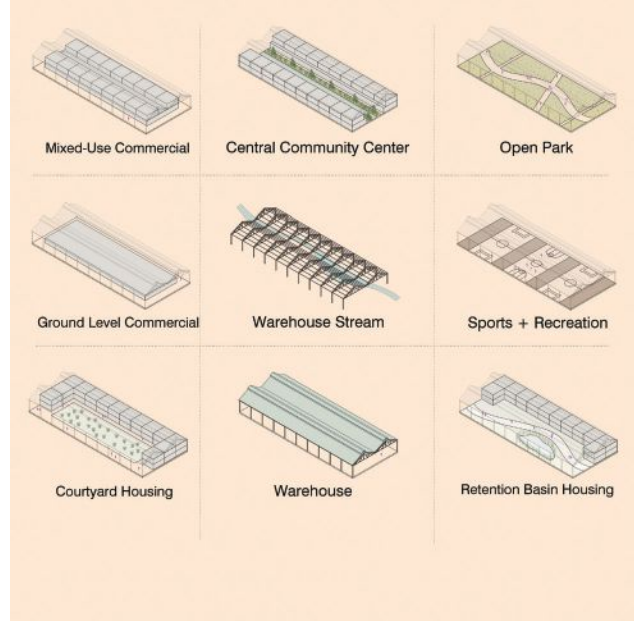
**Students:** Rehma Asghar, Catherine Brito, Cassandra Castillo, Priti Dawadi, Matteo Ferraro, Joseph Giambri, Naymah Hashmi, Vishnu Shankar Krishnan, Christopher Long, Rebecca Morales, Melissa Nieves, Sean Rackowski, Chau Tran, ASSOC. AIA, Bo Zhang (work submitted)



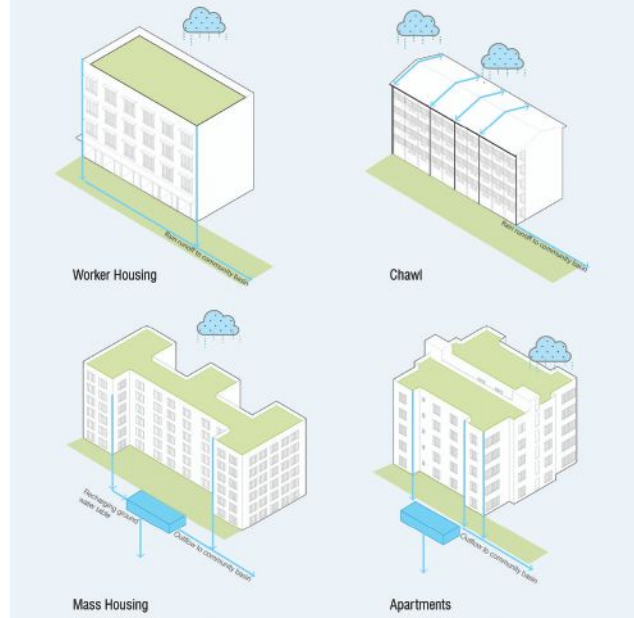
# THE HYDROHOOD HERALD BEST WATER HARVESTING



# THE HYDROHOOD HERALD RETROFITTING GODOWNS



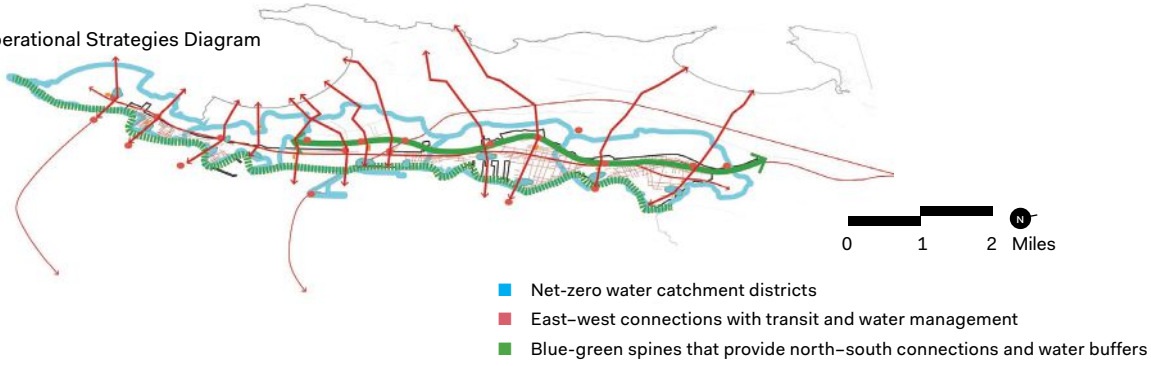
# THE HYDROHOOD HERALD ADAPTATION



### Socializing the Concept

Building out the students' proposal for redeveloping Mumbai's waterfront would take at least a generation and require buy-in from existing residents. To that end, the students created an advertising campaign of posters that can begin to socialize the concept of a hydrohood and the possibilities of retrofit and renovation to thereby change attitudes toward water use and collection.

Operational Strategies Diagram



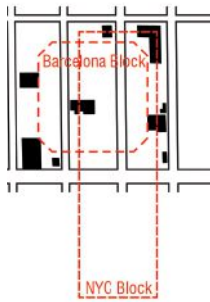
Example Hydrohood Site Plan



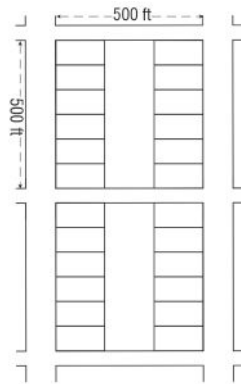
### Designing the Hydrohood

The students' proposal encompasses all of Mumbai's eastern waterfront, and would develop several distinct hydrohoods, all connected by strategies for mass transit, water buffers, catchment areas, and stormwater management (above). Each hydrohood (an example of one is shown opposite) is designed as a walkable, water-centric neighborhood that creates a mixed-use landscape, more thoroughly integrating residential, commercial, and recreational typologies and connecting them all via a variety of transit options. The students developed schemes to rethink the grid to better address water catchment and management (below), with strategies as large scale as the citywide blueways and greenways and as small scale as water-retention areas on each parcel.

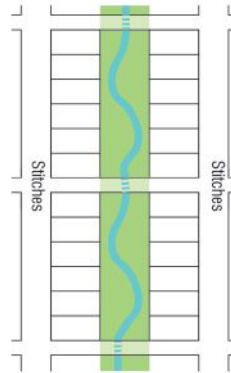
Existing Block



Hydrohood Block and Parcels



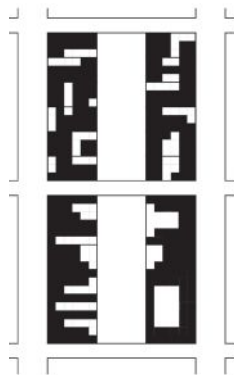
Blue-Green Spine



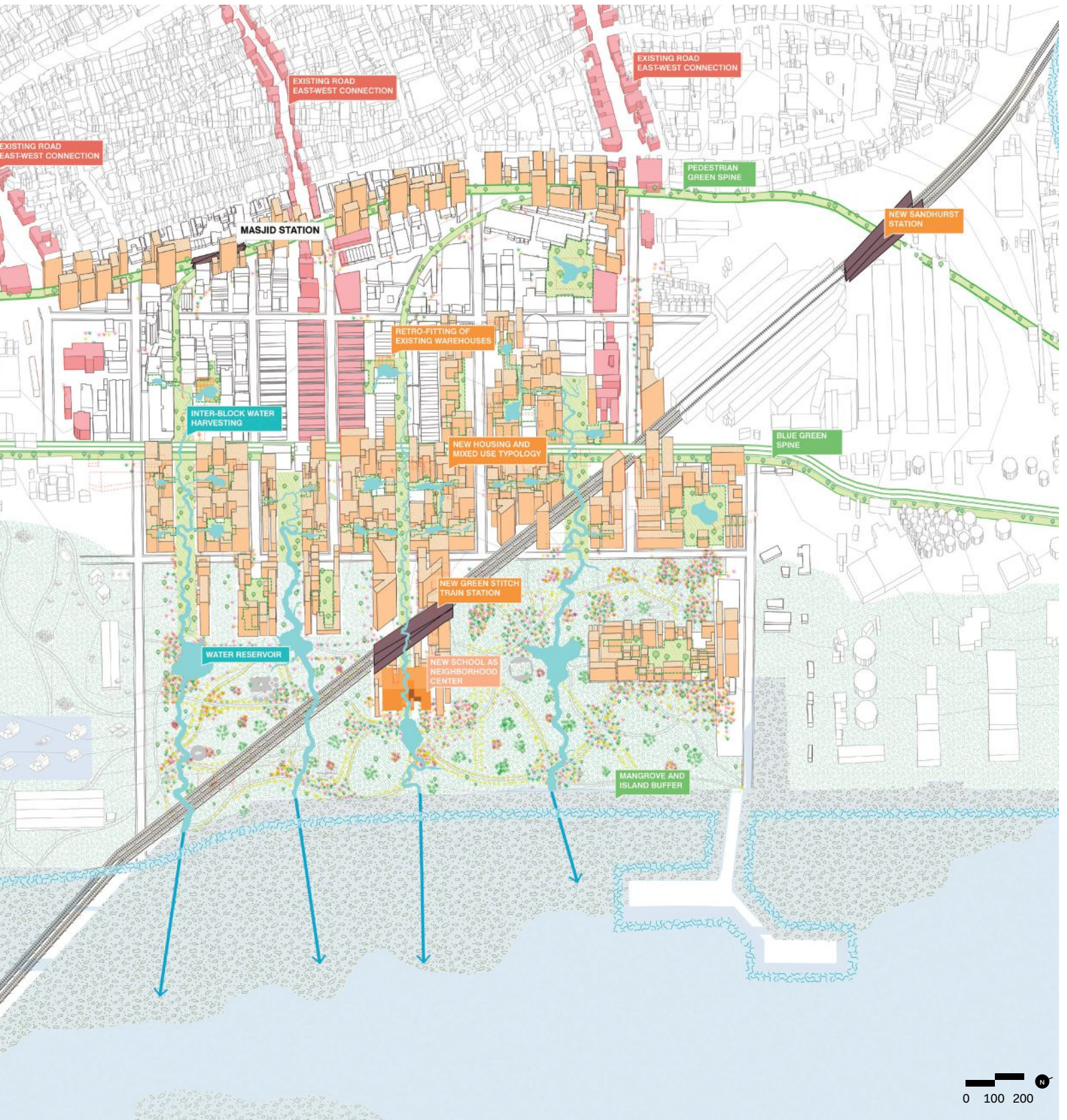
Water Retention in Parcels



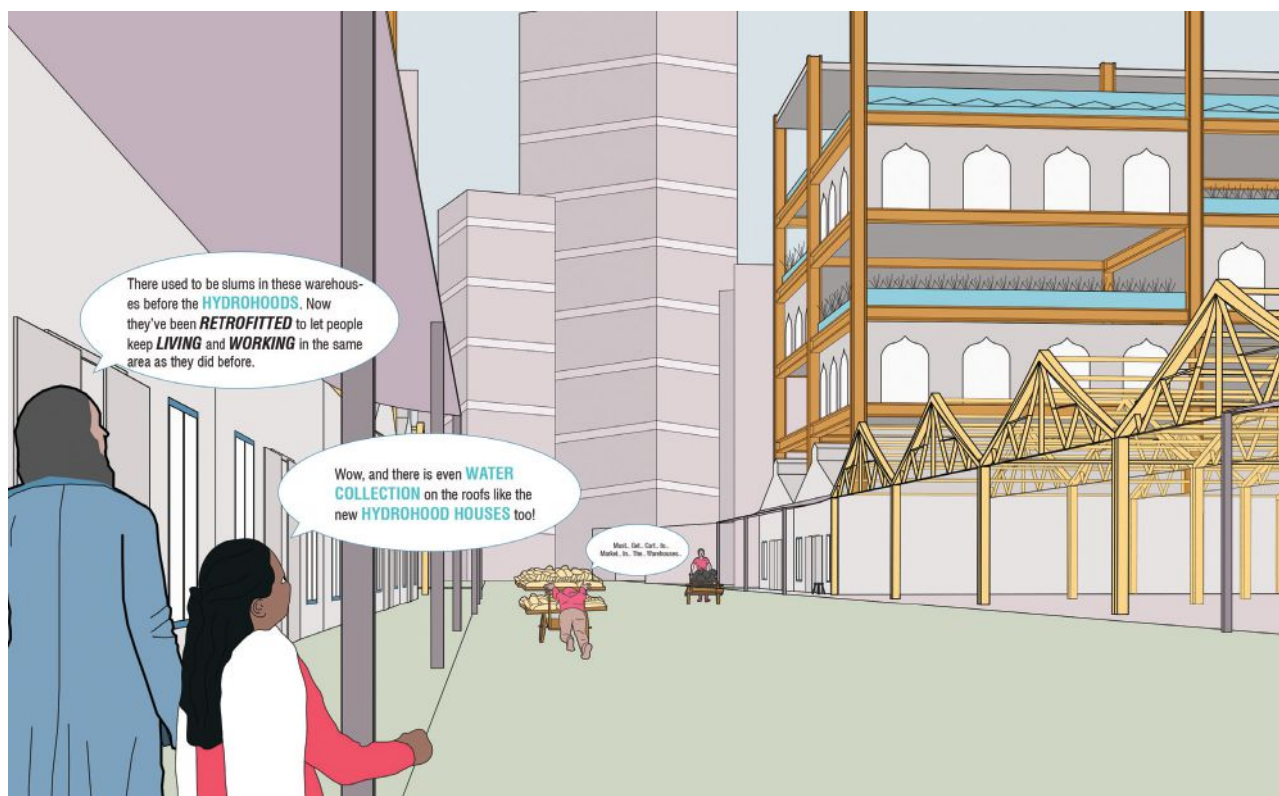
Flexible Configuration







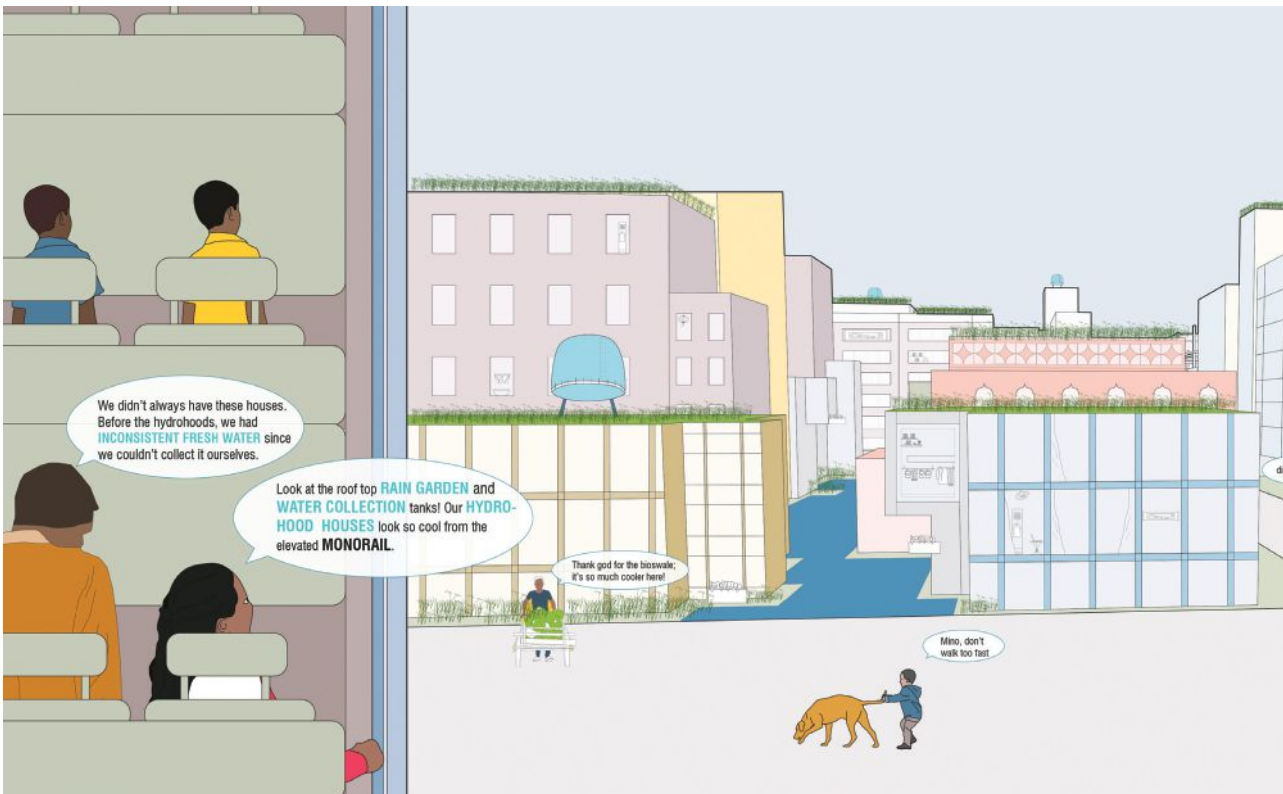




### Messaging

To further socialize the idea of hydrohoods beyond the advertising campaign, the students also developed "A Day in a Life of Paani, A Girl Growing up in the Hydrohood," a comic strip that follows a young girl of the future who lives in one of the completely retrofitted neighborhoods. It shows what the new hydrohoods would look like, and introduces readers to the idea that hydrophilic housing, walkable neighborhoods, and widespread mass transit can exist in place of existing slums.





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# Editorial: A Meeting to Remember

In July, the most powerful people in American architecture gathered in Chicago to deliberate the future of the discipline. The occasion was a routine meeting of the National Architectural Accrediting Board (NAAB), which turned out to be anything but routine after the organizers decided to radicalize the agenda and invite the full governing boards of architecture's five so-called collateral organizations. (I was on hand as an observer.) The participants, through their board seats, possess wide rule-making authority over architectural education and practice in the United States. It was made clear from the get-go that the conversation was designed to question current policy, not just of accreditation, but of other fundamentals such as licensure and equity, and ultimately of the collateral system itself.

The collaterals started taking shape in the 19th century, through a combination of top-down legislation and grassroots organizing. The membership groups came first: AIA in 1857, and the Association of Collegiate Schools of Architecture in 1912. The corresponding regulatory bodies, the National Council of Architectural Registration Boards, which oversee professional training and licensure, and NAAB, which sets educational standards and accredits schools, date to 1919 and 1940, respectively. The American Institute of Architecture Students got started in 1956.

Their charters involve a tangle of reciprocities: Group X gets a seat on Group Y's board, Group Z shares revenue with Group X, and the like. So you'd expect the collaterals' top dogs to hold regular planning sessions, and the presidents and executive directors ostensibly do meet twice a year. But according to several attendees in Chicago, the five full boards hadn't convened once in living memory.

The fact that the meeting occurred at all is significant, and the boards might want to repeat the experiment. These are unusual times, and ad hoc governance that perpetuates the status quo won't do.

Architects' capacity to thrive depends in part on the collaterals' capacity to address a host of clear and present dangers, including economic uncertainty, environmental degradation, monopolistic capital, political upheaval, social inequity, and tech disruption.

The profession as a whole needs to achieve resilience in the face of such massive change, just as individual practitioners are responding to increasingly extreme weather by making buildings and communities more resilient. To that end, the meeting organizers—including NAAB president Kevin Flynn, FAIA, president-elect Barbara A. Sestak, FAIA, and interim director Helene Combs Dreiling, FAIA—made no room for sacred cows, even inviting debate on whether the collaterals as they stand are up to the current challenges. There's always a danger that if an organization outlives the need that brought it into existence, it will blindly struggle to perpetuate said existence at all costs. A self-aware collateral, open to criticism, is a healthy collateral.

Architecture's survival requires strong, agile, fearless leadership, willing to ask tough questions of itself and others, and to make tough, even unpopular decisions. It took a lot of guts to put on the Chicago meeting, and to unreservedly participate. Let's hope good things come as a result.





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