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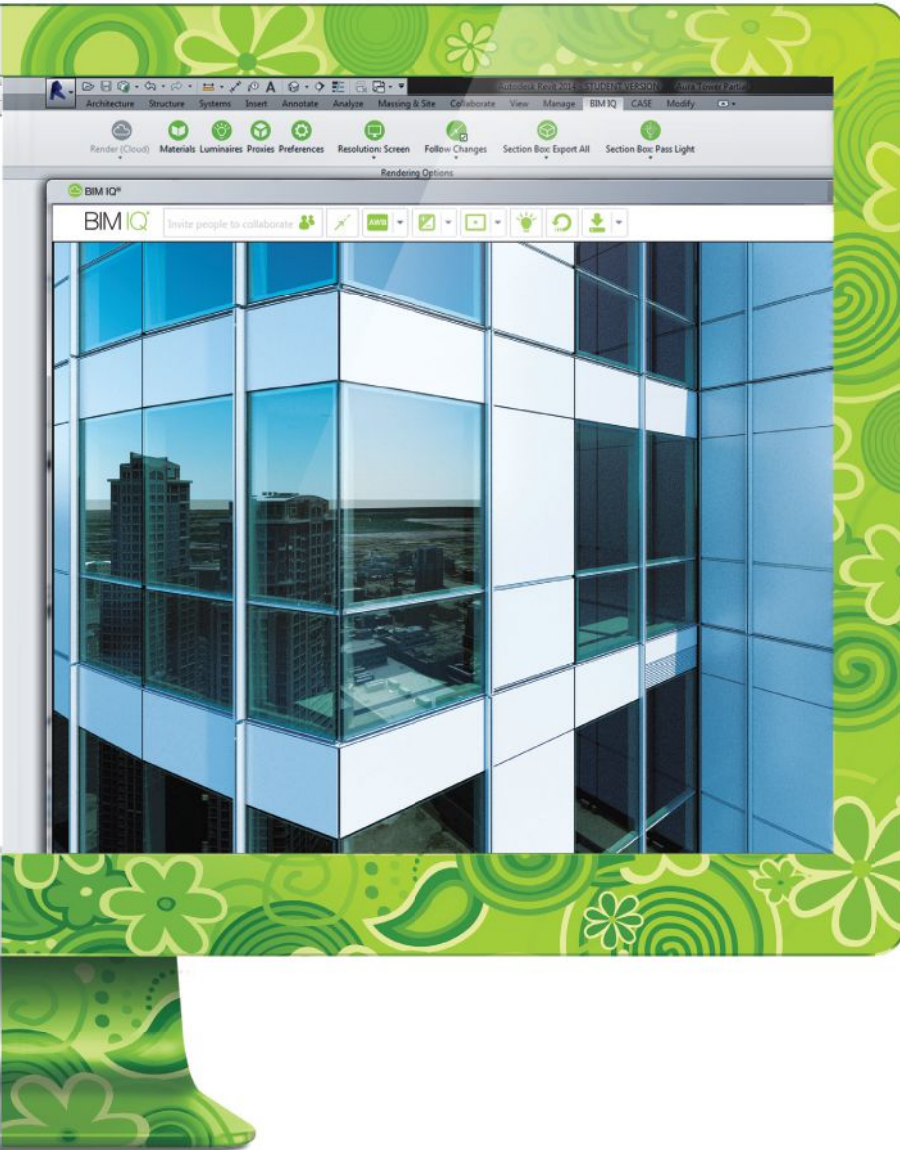
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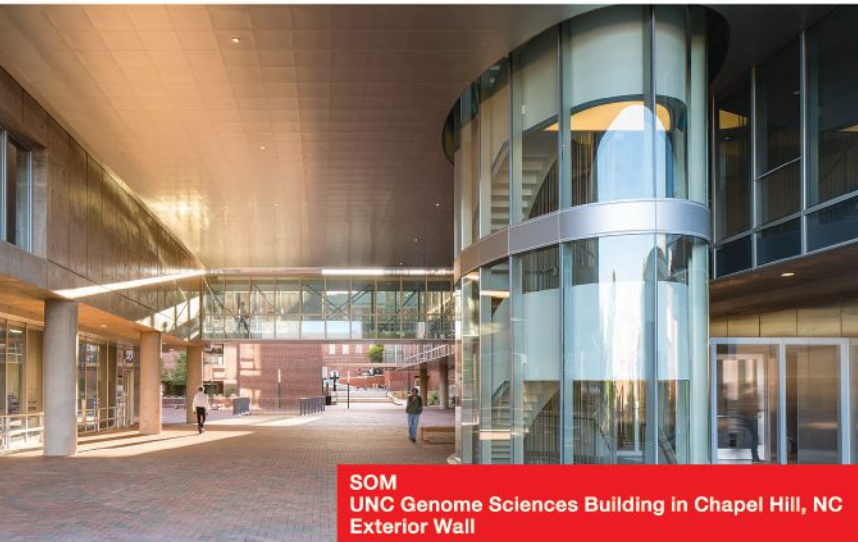
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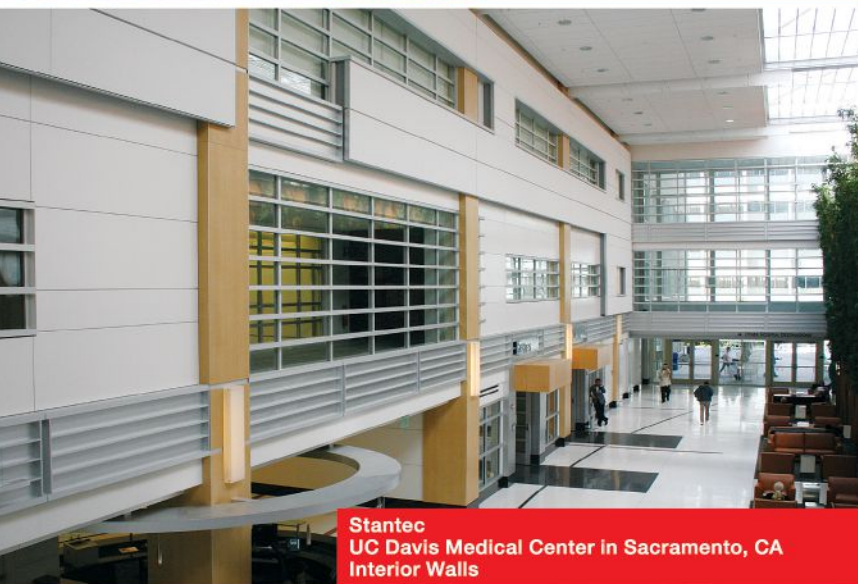
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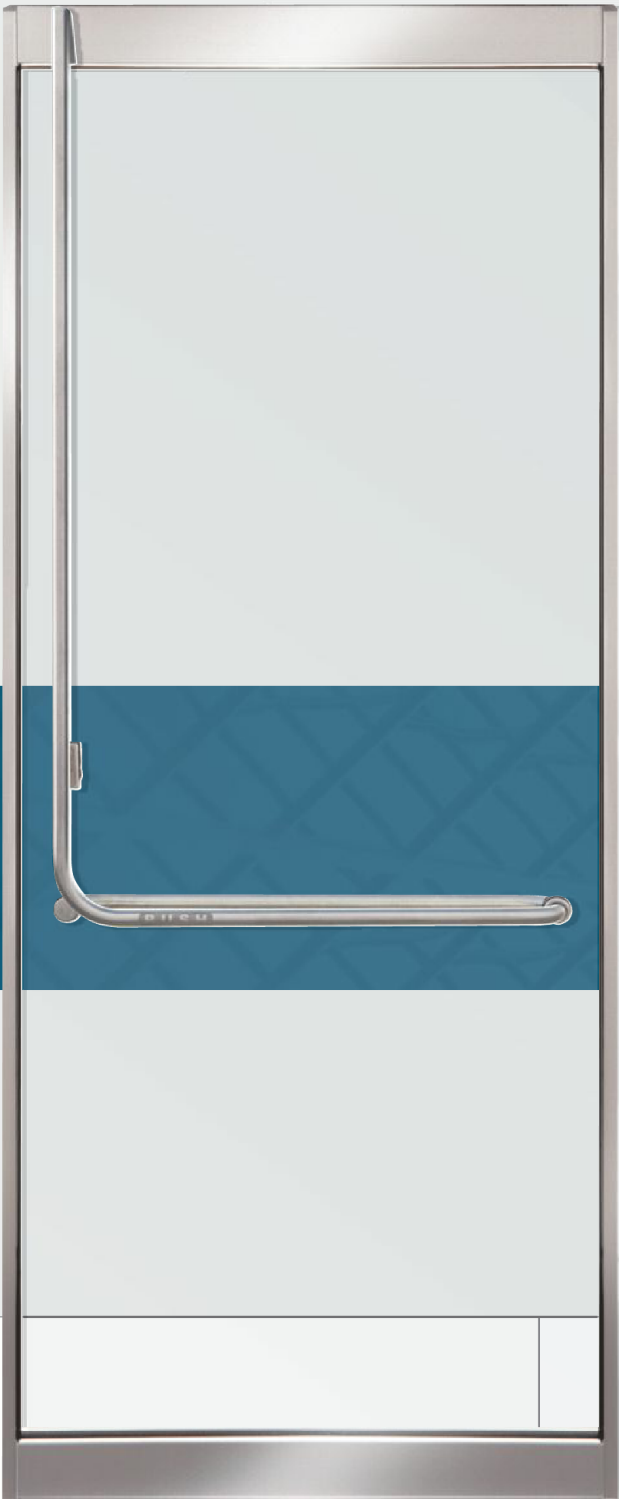
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Last year, air traffic controllers at San Francisco International Airport conducted 431,633 takeoffs, landings, and other operations, ensuring the safe delivery of 32,786 metric tons of cargo, 5,876 metric tons of U.S. mail, and more than 45 million passengers. With responsibilities such as these, we should be glad they have a state-of-the-art new workspace: a torqued, 221-foot-tall traffic control tower. The conceptual design is by airport master architect HNTB, with Fentress Architects and Hensel Phelps as the design/build team. Construction wrapped up last month; the tower goes operational next summer, once equipment fit-out is complete.



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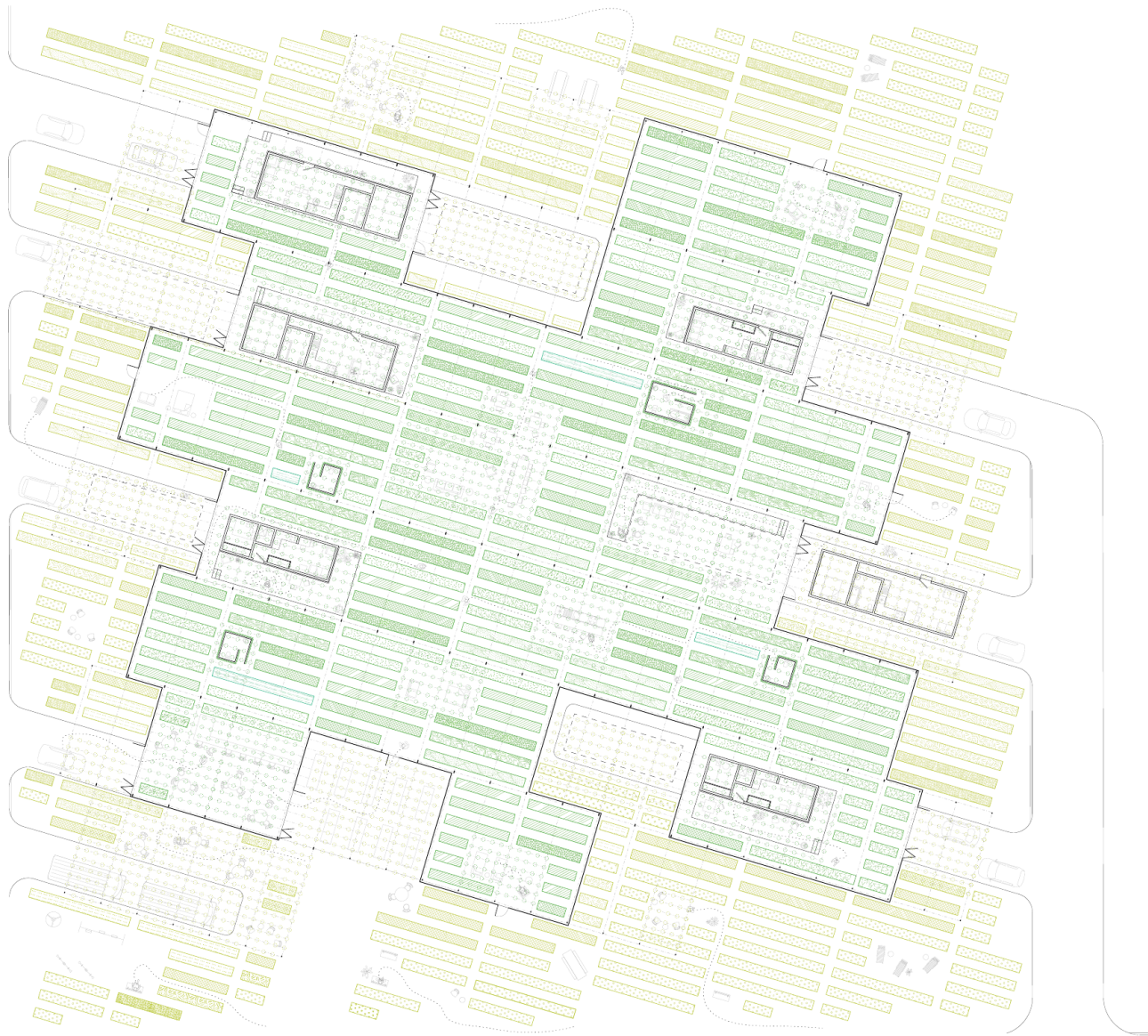


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### A Trailer Park for Marfa

Those familiar with the 2,000-person town of Marfa, in Far West Texas, may think of Donald Judd's installations or Elmgreen and Dragset's false Prada storefront. Despite the influx of art and money, low-income residents have limited prospects for employment and affordable housing. Elizabeth Yarina, a joint Master's student in architecture and city planning at MIT, proposes a hybrid trailer park and greenhouse that would accommodate up to 18 units while producing food and jobs for locals. The project is one of the inaugural AIA COTE Top Ten for Students, a program in partnership with the Association of Collegiate Schools of Architecture.

> For more on Elizabeth Yarina's scheme and the other AIA COTE Top Ten for Students winners, visit [bit.ly/COTEstudents](http://bit.ly/COTEstudents).





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### Michigan Avenue Redux

The Chicago Athletic Association opened its doors at 12 S. Michigan Ave. in 1893, just in time for the World's Columbian Exposition. In contrast to the Beaux-Arts classicism of the fabled White City, architect Henry Ives Cobb designed the 11-story clubhouse in a polychromatic Venetian Gothic idiom. In late May, John Pritzker, chairman of Commune Hotels + Resorts and son of prize-founders Cindy and Jay, reopened the doors after a sensitive renovation by Hartshorne Plunkard Architecture and überfashionable design firm Roman & Williams. The result: a 241-room boutique hotel called, fittingly, the Chicago Athletic Association Hotel.

> For more images of the restored building and Roman & Williams' interiors visit [bit.ly/CAAHotel](http://bit.ly/CAAHotel).



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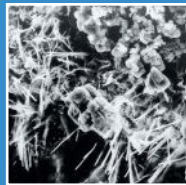
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### **Sarasota Showroom**

Add Sarasota, Fla., to the growing list of cities that boast their own architecture centers. And appropriately enough, the Center for Architecture Sarasota occupies a prime example of that city's eponymous midcentury modern movement: a 1960 furniture showroom designed by Joseph Farrell, AIA, and the late William Rupp, who ran Paul Rudolph's local office before founding his own practice. Sarasotan Guy Peterson, FAIA, whose Office for Architecture was named firm of the year in 2013 by AIA Florida, conducted the renovation. The 7,000-square-foot center now houses a gallery and studio space for the University of Florida's CityLab Sarasota.

> Learn more about the Center for Architecture Sarasota at [www.cfasrq.org](http://www.cfasrq.org).



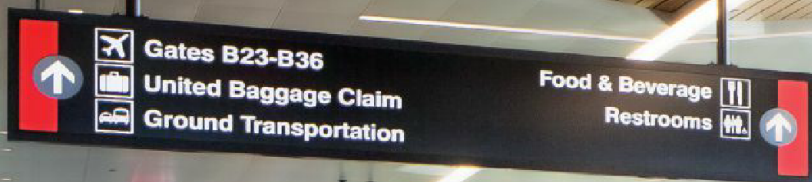
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# Best Practices: Manage Your Firm's Website

TEXT BY AMANDA KOLSON HURLEY

Designing an eye-catching website is essential in architecture. But the initial design is just the first step—you also have to maintain your firm's digital presence. Below are tips on how some practices keep their sites fresh and engaging.

## Decide How Much Access You Need

Before building the website, consider how much information your firm wants to add to it, and how often. If your firm is small, and announces projects and news only occasionally, you may not need to log in to a content management system (CMS), which is the back-of-house software that lets content managers publish and edit Web pages. Instead, it may be easier to outsource all such changes to whoever built your site, if that person is a third-party contractor. But this arrangement can become a source of frustration. Brien McDaniel, director of communications and senior associate at FXFowle, in New York, remembers

**“Working closely with the [website] designers will ensure the CMS is a priority and not an afterthought.”**

—Kelly Tigera, Snøhetta communications and business development manager

feeling stymied when he couldn't touch the dashboard on the firm's former website. “If there was a misspelled word,

we had to go to the designer to make that change,” he says. And every round of changes cost the firm money.

For the firm's current site, designers at Project Projects developed a custom CMS by tailoring a version of the open-source database Directus. Now McDaniel and his colleagues can add new projects and post news without requiring outside help.

Snøhetta, on the other hand, designed its website entirely in-house and hired a contractor to do the development work. (The firm does brand design, too, so it has digital expertise.) The site's custom CMS, designed by Snøhetta in cooperation with Norwegian tech firm Kodebyraaet, links directly to a digital archive, and staff can pull images over with ease. “Working closely with the [website] designers will ensure the CMS is a priority and not an afterthought,” says Kelly Tigera, the firm's communications and business development manager in New York.

## Set a Realistic Editorial Schedule

There's no point launching a slick site and then letting the content grow stale. Establish a schedule for adding news and blog posts. Don't forget to review key pages, such as staff bios, on a regular basis. Be realistic about how often the site has to be updated.

Social media platforms have eliminated some of the pressure to churn out content. McDaniel convenes a monthly ideas meeting and develops a story roster by drawing from his

colleagues' interests. “When you loosen the strings, you get a lot more people interested” in contributing, McDaniel says.

## Collaborate, but Clearly Define Responsibilities

Perkins+Will's website encompasses three main sections: a blog called Ideas + Buildings; microsites dedicated to research and building-product transparency; and project galleries. All of this adds up to a diverse and robust Web presence, one that would be impossible to manage without a clear game plan.

“Because we are such a large organization, we do need the participation of a lot of hands,” says Perkins+Will digital content producer Ryan Quinlan. “We've found [that setting] a clear delineation of who's going to be managing a page [from the get-go] has really helped in terms of keeping things up to date.” A core team of staff members manages the blog, with each curator generating ideas around certain topics. For the rest of the website, practice-area specialists work closely with the core online team to update their own pages. To ensure quality, Perkins+Will, as well as Snøhetta and FXFowle, give only a few employees permissions to input data into the CMS.

Delegating duties improves accuracy and prevents bottlenecks. It has another advantage, too, says Perkins+Will's chief marketing officer, Allison Held: “It pushes throughout the organization people's involvement [in the website] ... and feeling of ownership.”

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# Product Spec: LED Luminaire



TEXT BY WANDA LAU

LEDs were once touted for their energy savings—and little more. Now, after years of rapid advancement, the technology dominates the commercial lighting market. Here are several fundamental terms designers should know when specifying this source, using Durham, N.C.-based Cree's LN Series indirect/direct luminaire as an example.

**Color Rendering Index (CRI):** CRI values run from zero to 100 and indicate how well a light source shows the colors of the objects it illuminates as compared to the performance of a reference source—either a blackbody radiator or daylight. The 200 white LEDs in the LN Series has a CRI of 90-plus, while a

typical fluorescent lamp has a CRI in the 80s, says Gary Trott, vice president of product strategy for Cree.

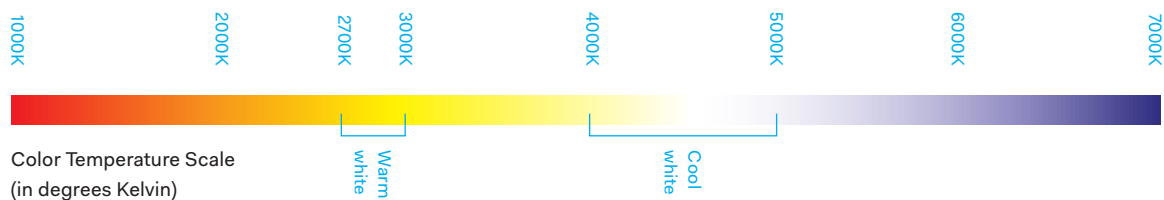
**Optics:** The concentrated light output of an LED isn't useful without lenses and reflectors to control its distribution. To minimize light loss, the LN Series leverages total internal reflection to extract up to 90 percent of the light from the LEDs uniformly through the luminaire's light guide—its acrylic wings.

**Efficacy:** Not to be confused with efficiency, luminous efficacy measures how much visible light is output per unit of electricity. The LN Series delivers 110 lumens per watt, about 30 percent more

than a typical fluorescent source, and 500 percent more than an incandescent.

**Correlated Color Temperature (CCT):** Measured in degrees Kelvin, the lower the CCT value, the warmer the tint of the source. Candlelight is rated at 1850K while daylight can top 5000K. LEDs were once notorious for their blue tint. The LN Series comes in two CCTs: a warm 3500K and a cooler 4000K.

**Dimming:** Many luminaires now integrate occupancy and daylight sensors to determine when to power down. The LN Series uses zero-to-10V dimming (similar to legacy sources) or Cree's digital "SmartCast" technology.







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# Next Progressives: Brillhart Architecture

AS TOLD TO DANIELLE RAGO  
PORTRAIT BY BRIAN SMITH

Context plays a big role in the design practice of Brillhart Architecture, run by husband-and-wife duo Jake Brillhart, AIA, and Melissa Brillhart. Located in Miami, and very much inspired by the landscape and vernacular conditions of the South, Brillhart's work rests gently on the land. In fact, many of the firm's projects are on stilts, such as their competition entry for Miami Seaplane Terminal, or hover lightly above the ground, as in (the architects' own) Brillhart House and their Case Study House project.

Recently, the Brillharts made news by being selected as a finalist for this year's Museum of Modern Art PS1 Young Architects Program. Their entry, entitled "Drones' Beach," was born out of the couple's deep connection to water, and their interest in transforming spaces into multisensory environments that engage with their users. In an interview with ARCHITECT, the Brillharts offer insight into their design philosophy.

## Firmly Grounded

If we had to describe the work and our approach to it, we'd say it's strongly connected to the landscape. We're integrating how our work engages the tropics in water and the idea of vernacular sustainability. We're essentially trying to create a new architecture for the tropics. A lot of it relies on specific vernacular principles that have become embedded in our mental consideration. We also focus on architectural primacy, composition, materiality, and the logic of construction.

The tropical component is a common thread that links all the projects together.

## Sensory Experiences in Architecture

Our projects are born out of a direct relationship to the landscape and to materials. What we're trying to create is honest architecture. Because of that, in terms of material compatibility and being sustainable, it becomes an experiential process in and of itself. A lot of our projects are moving with the landscape, whether they are a treehouse concept, up in the canopy, like Nantahala Outdoor Center, or a floating refuge, like our home.

We're starting on another project where the idea is a kind of path through the woods. As users move through the project in the landscape, their different experiences are based on what materials are being used and how they are being used. By integrating all those components together and delivering them, we can engage that human sensory experience.

## Analog and Digital Dialogue

We grew up in the analog world and then got a Master's in the digital world. There are only 15 years of people who have had that experience. Now you get to architecture school and it's all digital; before that, you entered architecture and it was all analog, drawn by hand. We were in the generation that was in that hybrid zone when all of this was new, and we were doing analog and digital simultaneously. We would set up

a matrix and do computer models, and we'd do real models, hand drawings, and watercolor drawings. The research angle of the office is really important to our work. You can reference and understand vernacular and historical products, but you also need to be able to look at it with fresh eyes and transform that into something new.

## Retracing Modernism

Drawing is the backbone of what we do. Using Le Corbusier's sketchbook as a travel guide, we went around and made drawings where he had many years earlier. We learned about form, light, structure, material, and composition. All these things are born and built in his drawings. Once you realize that, you can see his architecture and understand that drawing and design are completely intertwined. Le Corbusier's drawings, alongside our sketches, will be published later this year [by Norton Press] in a book called *Voyage Le Corbusier*.



Melissa and Jake Brillhart



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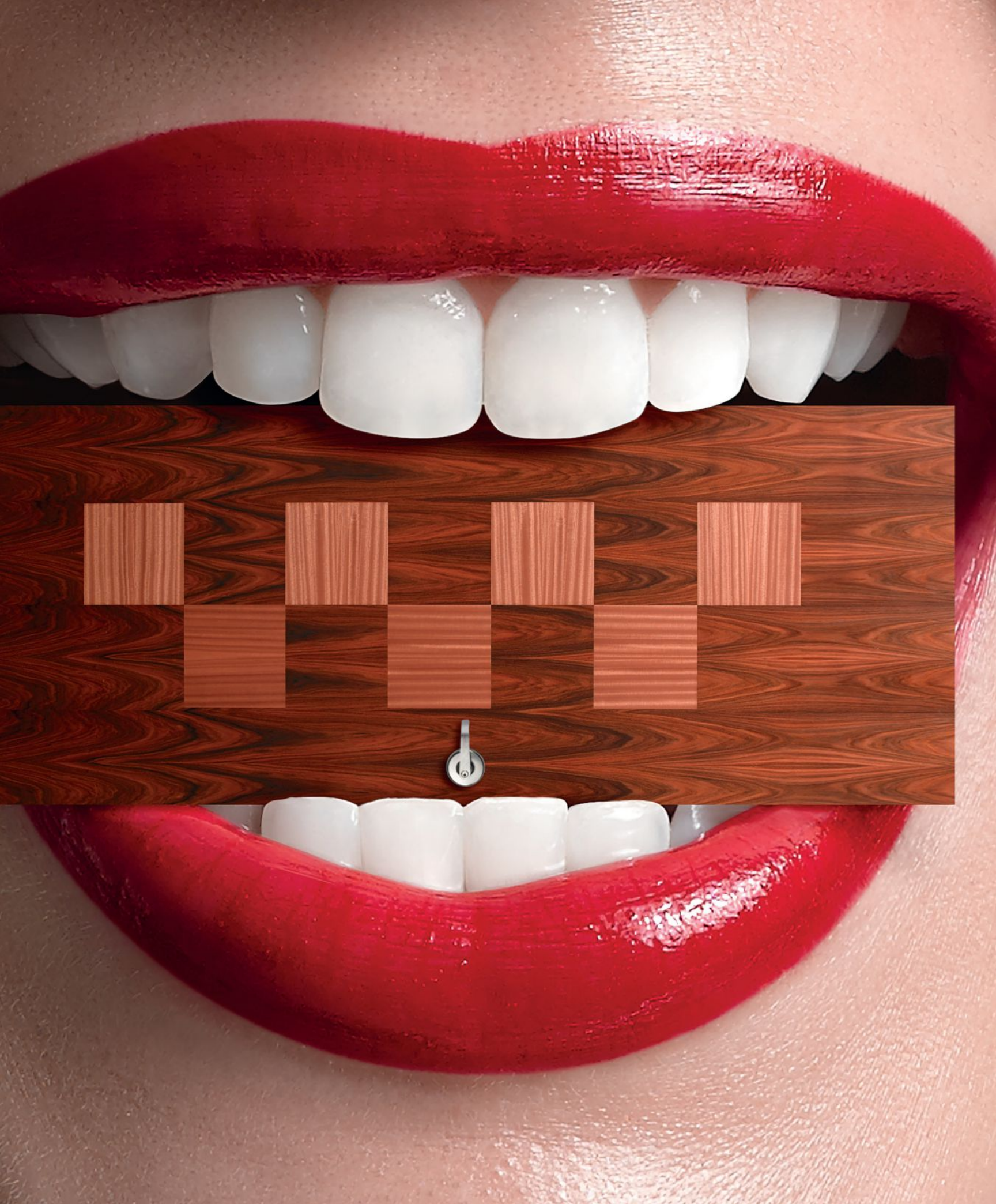
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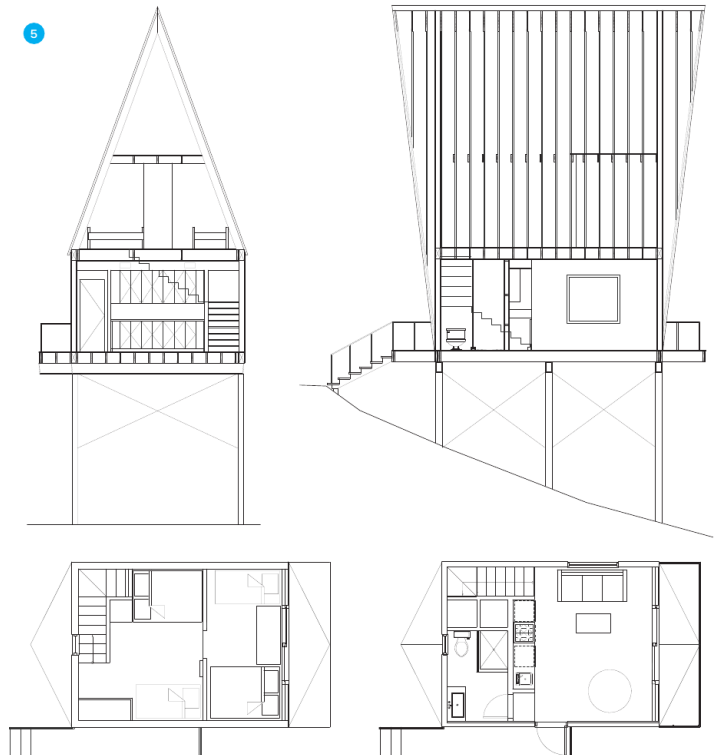
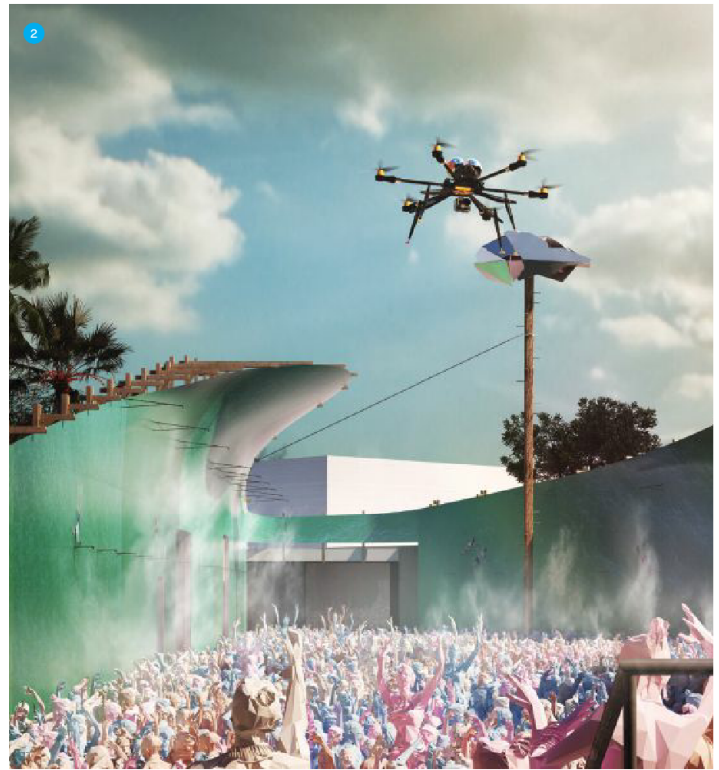
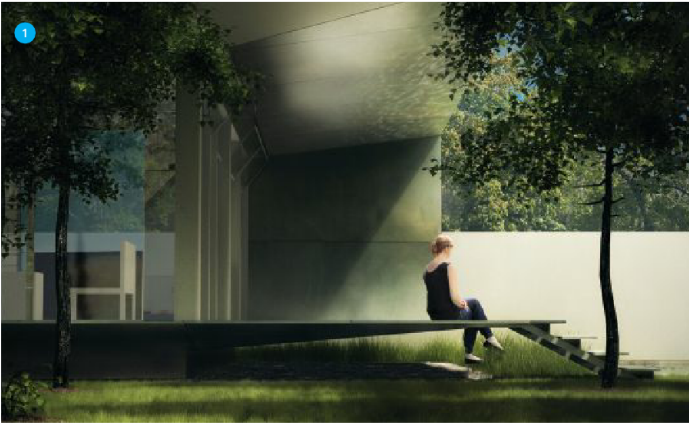
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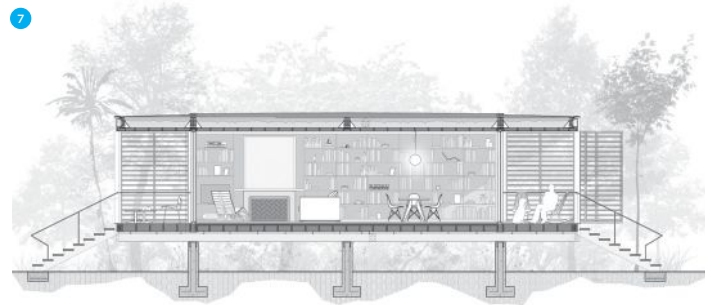


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**Next Progressives:  
Brillhart Architecture**







1. With a speculative design for a typical 50-foot by 120-foot lot, the Case Study House is the firm's rebuttal to the McMansion. Filling a mere 1,250 square feet, the house embodies Ludwig Mies van der Rohe's minimalist spirit, opting for a smaller footprint with better materials, which allows the balance of the lot to become a productive miniature orchard. 2. Brillhart Architecture's proposal for the MoMA PS1 Young Architects Program, "Drones' Beach," envisioned a multisensory experience featuring smells evocative of a tropical beach as well as aerial footage from drones that nest in faceted palm tree-like structures. 3,7. For the architects' own Miami residence, the Brillhart House, the duo applied principles of tropical Modernism to the dogtrot typology, elevating the 1,500-square-foot structure 5 feet off the ground and incorporating sliding glass doors that allow the house to open fully. 4,5. Brillhart Architecture devised a series of A-frame cabins raised on stilts for the Nantahala Outdoor Center in Bryson City, N.C., that are designed to house up to 10 people in multiple levels of living quarters on tight footprints able to be deployed uniformly across the variable terrain. 6. The Miami Seaplane Terminal (aka the Stilted Buoy) draws reference to Christo and Jeanne-Claude's 1983 project, *Surrounded Islands*, with hot pink legs elevating the terminal above Biscayne Bay.





## TO ACHIEVE A SEAMLESS TRANSITION FROM THE OUTSIDE-IN, **ONLY WOOD WILL DO**

When a venture capital firm that specializes in clean-technology start-ups retained Paul Murdoch Architects to design their corporate headquarters, they came to the project with some very specific—and somewhat unusual—requirements.

“This is a very hi-end and high-pressure corporate culture,” says Paul Murdoch, president of the firm. “We knew we needed to create a warm environment. We also needed to provide flexibility regarding the interior

spaces. The building has to function as temporary office space for the start-ups being incubated within. And finally, we needed to accomplish this on a very tight piece of property with zoning restrictions.”

Located in Menlo Park, CA, the infill site is nestled among redwoods in a mostly residential neighborhood of primarily wood construction. The key question became, how does one create a space that meets these needs, seems spacious and projects the client’s culture and values?





## Wood is the Clear Choice

The obvious material choice was wood. The architects created a 12,500 sq. ft. glass, two-story building, which rests atop a podium that provides underground parking. In order to meet LEED certification requirements, provide a measure of privacy, and blend into the surrounding neighborhood, a layer of wood screens were attached to the exterior of the entire building. These screens are essential for keeping the building cool yet maintaining the sense of transparency that the underlying glass box was designed to create.

“Wood was certainly the best material for creating these exterior trellises,” explains Murdoch. “We could have used another material—metal might have matched the performance of wood, but the building would not have the same aesthetic quality. It would be harder. Sharper. Wood creates softness and a sense of continuity from the outside, in. It’s seamless.”

The exterior trellises are made from reclaimed cedar, a native species. The wood has a very tight, linear grain and is stained with just a tint of silver and gold.

To complete the seamless transition from outside to interior space, gardens were incorporated on each level of the building.

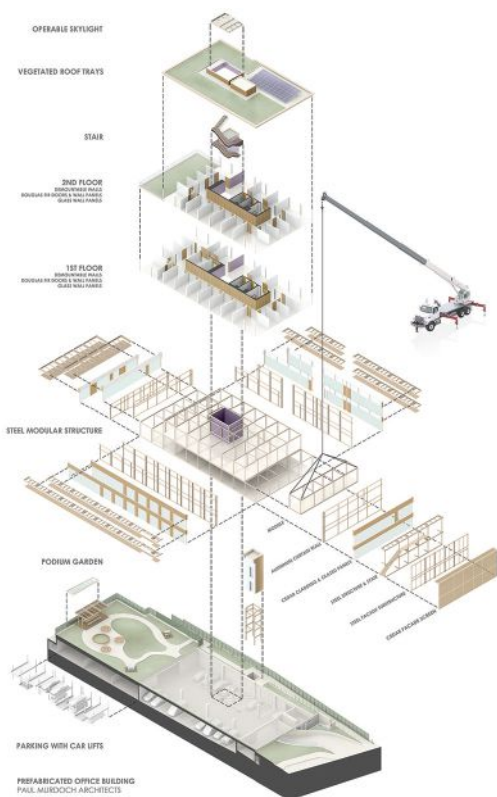
## A New Model of Modularity

Construction of this building was challenging given the size of the lot, its lack of a staging area, and the conditional use permit on the project. In an effort to create goodwill within the surrounding neighborhood, a goal to decrease noise and construction time was necessary. The architect chose to pre-fabricate most of the building off-site, including the wood trellising. The podium/parking garage took a full year to construct; the building itself, an additional sixteen months. The architect estimates that by using pre-fabricated modules, they were able to shave almost four months off of the total construction time.

“The entire curtain wall system—the glass, flashing, doors and windows, and insulation behind the cladding—were all fabricated in Northern Italy. The cladding and window screens were all pre-fabricated in Northern California,” explains Murdoch. “This was like an R&D project to see how it works. We can certainly translate some of the benefits of this project to others, but not all. We’d need to evaluate it on a case-by-case basis.”

Because the interior office space requires flexibility to accommodate short-term occupants, a modular “de-mountable” wall system was developed. While many of the walls have a marker board finish to stimulate brainstorming, the remaining walls are made from Douglas fir. The wood has a narrow grain with natural variations and was lightly wire brushed. De-mountable wall systems are a novel way to remodel commercial spaces with low-impact.

Incorporating varied, pre-fabricated wood components (i.e. trellising, interior modular walls and ceiling panels, doors and built-in cabinetry) is the prime design feature that makes this a stand-out project. Wood provides the required warm aesthetic, enhances energy-efficiency and delivers the flexibility that was needed to serve the client, the neighborhood and the building codes.



**PROJECT**  
Venture Capital Office Headquarters

**LOCATION**  
Menlo Park, CA

**ARCHITECT**  
Paul Murdoch Architects

**ENGINEER**  
Simpson Gumpertz & Heger

**CONTRACTOR**  
Louis Ptak Construction

**PHOTOGRAPHER**  
Eric Staudenmaier Photography

**AWARDS**  
2014 Institute Honor Award In Interior Architecture, American Institute Of Architects  
2014 International Award Of Excellence, IALD

2014 Sustainability Award, IALD  
2013 Merit Award In Architecture, American Institute Of Architects California Council  
2013 Lumen West Award Of Excellence, Illuminating Engineering Society  
2013 Edwin F. Guth Memorial Award Of Excellence, Illuminating Engineering Society  
2013 Light & Architecture Design Award, AL Magazine



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# Detail: Private Grotto Sauna

TEXT BY JENNY JONES

The outer island in Ontario's Georgian Bay is mostly undeveloped in the spot where a private owner commissioned Toronto-based Partisans to design an artificial grotto. The 800-square-foot sauna, which appears as though carved from the shore, has a "simple geometry, rising and being born of this rock," says Partisans co-founder Alexander Josephson.

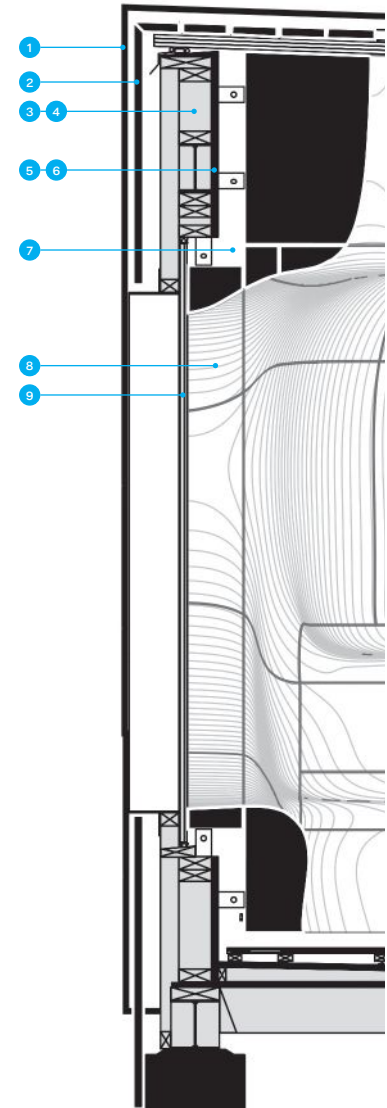
The firm worked with Mississauga, Ontario-based contractor EllisDon to survey the site using a Leica 3D-scanning device and collected 90 million data points. The team manipulated the scan with Autodesk ReCap and modeled the structure with Rhinoceros and Grasshopper.

Instead of western red cedar, a popular choice for saunas due to its warm hue, the team used custom-cut and dried northern white cedar because of its quality, aroma, and abundance in the area. "It also has some knots in it, so there's a bit of character to the wood," Josephson says.

Inside the sauna, 117 curvilinear wooden panels line the walls. Toronto-based Millworks Custom Manufacturing CNC-milled the panels, which are each distinct. Cut from raw wood blocks up to 4 feet by 8 feet, the 7.5-inch-deep panels range from 10 inches square to 48 inches by 114 inches; the larger pieces were joined after milling. Galvanized steel brackets hold the panels together, creating a smooth, sinuous space.

On the exterior, the sauna's walls and roof are clad in approximately 280 square-cut cedar planks with a weather-resistant finish. Their distinct carbon color comes from *shou sugi ban*, a Japanese wood-charring process, which Josephson says "was analogous to what was going on inside the space, which is obviously a hot room."

On-site construction took just 12 days, which Josephson attributes to the thorough digital scanning and modeling work done up front: "We planned the whole thing very accurately," he says.



1. Cedar plank cladding
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3. Closed-cell spray foam insulation
4. Structural steel cage with wood framing
5. Plywood sheathing
6. Sauna foil vapor barrier
7. Plenum, 2" to 4" wide
8. Cedar paneling
9. Porthole window

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JONATHAN FRIEDMAN



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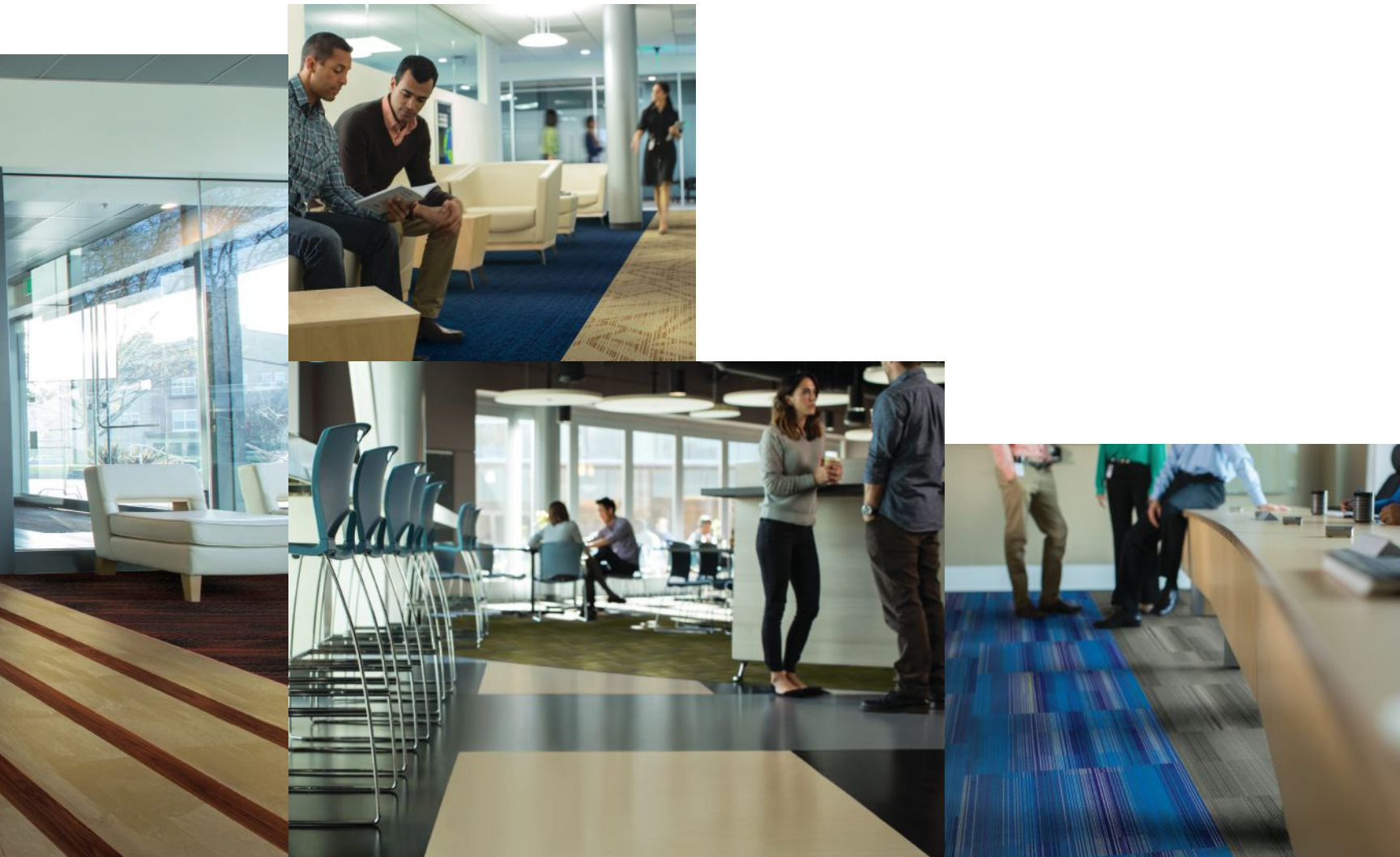
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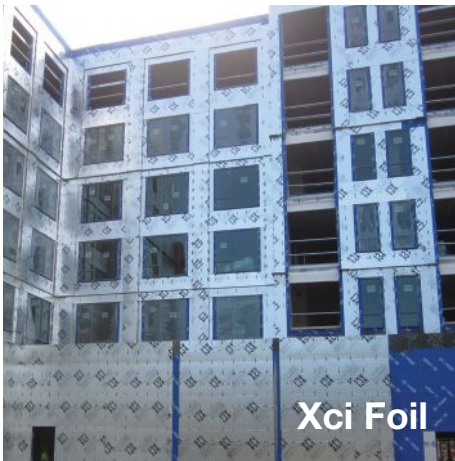
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# AIA Architect

## AIA Voices



PHOTOGRAPHY: CARL BOWEN

### The Behavioralist

**How buildings are used is as important as why.**

Julie Kriegh, AIA, principal and founder of Seattle-based Kriegh Architecture Studios, is a 2014 Upjohn Research Initiative grant recipient for her work in understanding how behavior can drive building performance. Kriegh, who is pursuing a doctorate at the University of Washington, is collaborating with environmental psychologists Lynne Manzo and Linda Steg and Center for Integrated Design researchers Joel Loveland and Heather Burpee. Her architectural design studio is united by a research agenda that centers on evidence-based design. “If we encourage pro-environmental behavior at the community or neighborhood level,” she asks, “will we motivate people to engage in sustainable behaviors at the individual or household level?”

Social norms and the idea of individual agency are both important. But the idea of outcome efficacy—that you can, and will, make a difference because of your behavior—is incredibly so to environmental psychology. One of my theories is that if we encourage pro-environmental behavior at a community level, it will foster behavioral change at the level of the individual.

Clients, building users, and architects can contribute to the protection of our environment by using resources wisely. That could be about materials or that could be the amount of energy a building demands, among other things. If you can thermally control an environment, create comfort, and dial down energy use in the first place, you can get to net zero really quickly.

From the perspective of environmental psychology, you have to understand base values before you can design a building for people. To that end, I issue a values survey to communities, community groups, and client groups—focused on pedestrian access, for example, if I’m doing a master plan. If it’s a

house, I’ve found that it’s about designing forms that are elemental and easily divided into zones. Thermally, you can isolate these zones to create greater efficiencies.

It’s all in how people use their buildings, though—and that’s key. Just because your building sips energy doesn’t mean it’s wise to use more energy than you need. Now that I’m a Certified Passive House Consultant, I’m wondering why we can’t set up buildings to work properly in the first place. It is a matter of values that a client brings—altruistic, biospheric, or egoistic—and perceived value of benefit to cost. Yes, there are more upfront costs—and that’s difficult—but there are greater long-term benefits as well. We absolutely know how to design buildings and neighborhoods that promote well-being and abundance, but behavior is the wild card. My main question is: If we can understand behavior and create “situational cues” or “factors” in the physical environment, can we encourage people to use less energy? **AIA**

As told to William Richards



**Evelyn Lee, AIA**  
Member since 2003

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“As an architect, I do not thrive as a designer of buildings, project manager, or construction administrator. I found my place as a design strategist. I get involved early in the process, when decisions are made about spending capital assets. I offer clients design thinking upstream rather than responses to preexisting conditions. Some may call this an alternative career. I call it **architecture plus.**”

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# AIA Now

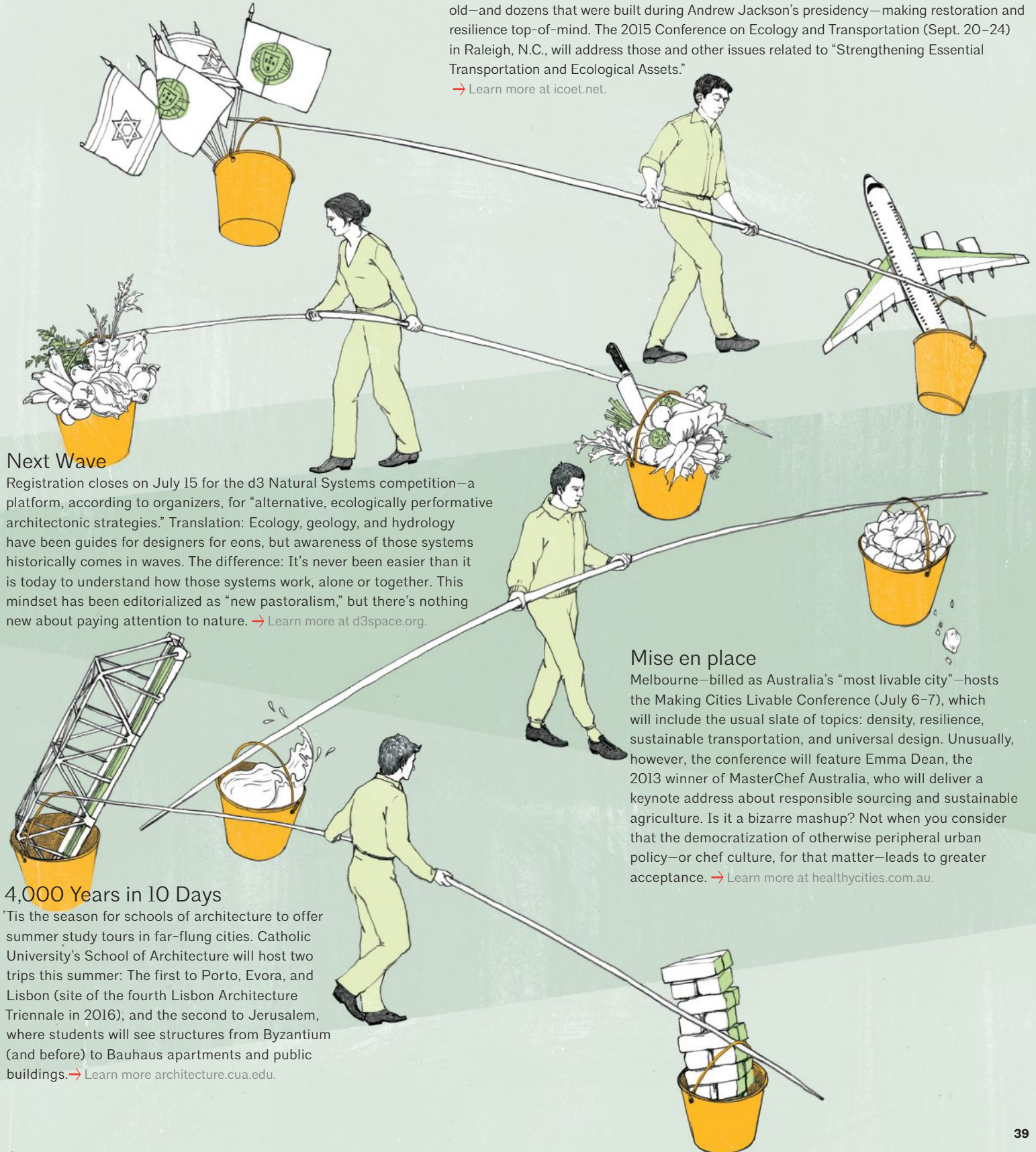
## Edge Conditions

By William Richards  
Art Direction by Jelena Schulz

### Road Trip

The Eisenhower Interstate Highway System in the U.S. is more than a half-century old. Across the U.S., there are hundreds of bridges and culverts that are more than a century old—and dozens that were built during Andrew Jackson's presidency—making restoration and resilience top-of-mind. The 2015 Conference on Ecology and Transportation (Sept. 20–24) in Raleigh, N.C., will address those and other issues related to “Strengthening Essential Transportation and Ecological Assets.”

→ Learn more at [icoet.net](http://icoet.net).



### Next Wave

Registration closes on July 15 for the d3 Natural Systems competition—a platform, according to organizers, for “alternative, ecologically performative architectonic strategies.” Translation: Ecology, geology, and hydrology have been guides for designers for eons, but awareness of those systems historically comes in waves. The difference: It’s never been easier than it is today to understand how those systems work, alone or together. This mindset has been editorialized as “new pastoralism,” but there’s nothing new about paying attention to nature. → Learn more at [d3space.org](http://d3space.org).

### Mise en place

Melbourne—billed as Australia’s “most livable city”—hosts the Making Cities Livable Conference (July 6–7), which will include the usual slate of topics: density, resilience, sustainable transportation, and universal design. Unusually, however, the conference will feature Emma Dean, the 2013 winner of MasterChef Australia, who will deliver a keynote address about responsible sourcing and sustainable agriculture. Is it a bizarre mashup? Not when you consider that the democratization of otherwise peripheral urban policy—or chef culture, for that matter—leads to greater acceptance. → Learn more at [healthycities.com.au](http://healthycities.com.au).

### 4,000 Years in 10 Days

’Tis the season for schools of architecture to offer summer study tours in far-flung cities. Catholic University’s School of Architecture will host two trips this summer: The first to Porto, Evora, and Lisbon (site of the fourth Lisbon Architecture Triennale in 2016), and the second to Jerusalem, where students will see structures from Byzantium (and before) to Bauhaus apartments and public buildings. → Learn more [architecture.cua.edu](http://architecture.cua.edu).



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and the Architect:  
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# AIA Practice

## Discern, Disclose, Disengage

### Encountering and contending with conflicts of interest.

Like many professional codes, the AIA Code of Ethics and Professional Conduct has something to say about conflict of interest. To wit, Rule 3.201: “A Member shall not render professional services if the Member’s professional judgment could be affected by responsibilities to another project or person, or by the Member’s own interests, unless all those who rely on the Member’s judgment consent after full disclosure.”

The commentary to this rule stresses that “those who are entitled to disclosure may include a client, owner, employer, contractor, or others who rely on or are affected by the Member’s professional decisions.”

There it is, in black and white. But as a practical matter for architects, we must ask: Does the Code of Ethics adequately cover the sensitive topic of a conflict of interest?

Architects may find themselves in any number of circumstances where a conflict may present itself. One such instance would be sitting on a planning commission likely to rule on a project for which he or she is being considered. Another would be when two clients who are doing the same type of project (hotels of similar scope, say, on opposite corners of the same intersection) consider engaging the same architect.

In the first case, the conflict is obvious. Even with the very best of intentions, the architect could slip into unintended bias. In the second example, the architect must weigh whether full disclosure to both clients will be adequate, or if there is too much potential for one client to seek a competitive advantage or for the architect to inadvertently favor one client over the other.

Disclosure is required in the Code of Ethics, but disengagement (withdrawing from the project) is the only surefire way to avoid a conflict. Ultimately it is up to the architect to make the decision when an apparent conflict presents itself. And, in the essential step of disclosure, there are likely to be multiple parties that are “affected by the Member’s professional decisions.”

But what do you do if a conflict becomes evident after you’ve begun on a project, something that in legal parlance is termed a “thrust-upon conflict”? Could you have



ILLUSTRATION: MICHAEL GLENWOOD

## The best time to assess and wrestle with these nuances is at the beginning of the project.

reasonably foreseen the conflict before you undertook the project? And what about an “inherited conflict,” when an architect discovers that a consultant—or an associated architecture firm—brings a potential conflict to an already established relationship? The “thrust-upon conflict” may be an example where an architect might—with proper disclosure and a fair evaluation of the negative consequences of disengaging from a project well underway—maintain an ongoing relationship after the conflict has come to light.

Confusion is also common with respect to the term “appearance of a conflict,” which appears in the Code of Ethics. The best way to determine whether “appearance of a conflict” constitutes a real conflict is to assume that if it appears to any affected party that a conflict exists, the conflict may as well be real. The best time to assess and wrestle with these nuances is at the beginning of the project—

before pen and pencil are set to sketchpad or signatures are recorded on an agreement.

The Code of Ethics assumes that AIA members will follow a number of steps with respect to conflicts of interest. Discern—or, identify—the conflict. Disclose the conflict to the parties who might be affected. Disengage if appropriate. Without these steps, there is the risk is that the architect—perhaps overconfident as to his or her own professional integrity—will neglect to identify the conflict, overlook a party to which disclosure should be made, and fail to disengage when appropriate. Even when consent is given after full disclosure, there are situations where disengagement (and declining to “render professional services”) might yet be the wisest option. **AIA**

Cornelius (Kin) DuBois, FAIA

Kin DuBois, FAIA, is a member of the AIA National Ethics Council.

AIAFeature

# Flexing Forms

A focus on a user's agency in altering and shaping his or her environment defines the 2014 AIA Upjohn Research Initiative grant recipients.

Kim O'Connell



ILLUSTRATION: MICHAEL KIRKHAM



For centuries, fabric was largely a decorative element of architecture in the form of curtains, wall hangings, and floor coverings. Today, new technologies are transforming fabric into a building material in its own right, creating what some researchers call “responsive architectural systems” in which users act as de facto architects, determining how a space may be used and, indeed, transformed to fit changing needs.

At the University of Michigan, Sean Ahlquist is examining how textile-composite materials can be reshaped for architectural use without complex armatures or mechanical controls. It is work that can transform not only our streets and cities, but also the very way we think about architecture in our lives.

Ahlquist is one of three recipients of the AIA’s 2014 Upjohn Research Initiative grants, which support applied research efforts that push the boundaries of design and construction. All three engage users in novel ways, including a project at the University of Buffalo that combines Google Glass-type eyewear with BIM, and another at the University of Washington that examines how the psychology of human behavior influences design. Taken together, they represent a trend toward viewing building users not just as clients who will be given an end product, but as participants who will help shape and reshape the spaces they inhabit.

### Morphable Surfaces

Incorporating lightweight materials and fabric into structures is not new—think of the Denver Airport’s tent-like fabric roof (designed by Curtis Fentress, FAIA, and a partnership of

architects) or the Munich Olympic Stadium, designed by Frei Otto, who died on March 9 at the age of 89, one day after being told that he had won the prestigious Pritzker Architecture Prize. In his project, Sean Ahlquist, an assistant professor of architecture at Michigan’s Taubman College of Architecture and Urban Planning, and his colleagues are hoping to take these existing technologies a step farther. Their goal is to create a wide new range of so-called “morphable surfaces” using a composite material that has the appearance and behavior of a textile but can be manipulated to act as a structural component, encouraging more user-adaptable spaces. Imagine a material that is rigid enough to be used as a work surface but malleable enough to be folded and easily pushed out the way.

In particular, says Ahlquist, the team is studying how industrial knitting methods can create interlocking and looping structures (as opposed to weaving, which is about bidirectional overlapping) that afford greater flexibility in terms of shaping, layering, and fiber orientation to create form. Since winning the Upjohn grant, Ahlquist’s team has acquired an industrial knitting machine through which the researchers are testing hybrid fabrics knitted from special yarns and

nickel titanium memory wire.

“The basis of the research for the grant is looking a bit more into composites, thinking about how much variation in one piece of material you could produce,” Ahlquist says. “This is about embracing an architecture that is about elasticity, about materials that are designed to be malleable and transformable.”

Yet these materials are also designed for efficiency, functionality, and resiliency, allowing bending and extension without requiring a hinge or other mechanical movement that may fail down the road. And failure is not an option in a post-Katrina or post-Sandy era, where there’s a high premium on reliability.

Another goal of the work is to make architecture a full, sensory experience. “We’re making these incredible textures, and the first thing you want to do is touch it,” Ahlquist says. “But the last thing we talk about when we talk about architecture is touching it.”

### Behavior and Building

Like high-performance fabric, high-performance buildings are malleable, too—but not in the way one might expect. Upjohn grant recipient Julie Kriegh, AIA [see this

# AIA Feature

CONTINUED

month's AIA Voices on page 37], is pursuing a doctorate at the University of Washington and, as principal of Kriegh Architecture Studio, designing high-performance Passive Houses. Working with a multidisciplinary team—including environmental psychologists Lynne Manzo and Linda Steg as well as Center for Integrated Design researchers Joel Loveland and Heather Burpee—she is examining how architecture might influence people to become better global citizens. The trick? Getting people to exhibit what she calls “pro-environmental behavior,” or PEB.

PEB, at a basic level, is about turning off lights when you exit a room, recycling, conserving water, taking public transit, and purchasing sustainable or third-party-certified products. And for years now, many architects have focused on designing buildings and spaces that aid such behavior—low-flush toilets and sensors that know when a person leaves a room to automatically dim the lights are two examples that have become relatively ubiquitous. But, for Kriegh, there is a disconnect between the modeled energy performance of a Passive House, for example, and the actual energy used. That difference often comes down to the users.

“There’s sometimes a gap between intention and behavior,” Kriegh says, “that led me to study the role architecture plays, in and of itself, as an actor in people’s lives, and how that relationship impacts energy use and pro-environmental behavior.”

One of the questions Kriegh is examining is whether people who exhibit PEB are drawn to living and working in high-performance buildings, or whether high-performance buildings influence people to exhibit more PEB, or both. Similarly, Kriegh and her team are studying what she calls the “place-attachment” and “green-identity” context of architecture (how people attach to a place and how that affects their self-identity and worldview, like the way people might be attached to their homeland, a favorite vacation spot, or the place where they grew up). What is it about architecture that creates that attachment? Does architecture have anything to do with it at all?

To answer such questions, Kriegh and her team are using a combination of tools, including implementing PEB surveys, gathering data from energy measurement systems, and studying different design and delivery methods and case studies. In some cases, the team will install dashboards to monitor energy usage in a building. After sharing that data with users, the team will assess how perceived behavior (survey)

predicts actual behavior (energy monitor) to see whether and how the feedback data changed their behavior. This data will be compared to energy bill data to establish an EUI (energy use intensity) that can then be compared to national and regional energy use data baselines.

Soon user-acquired data might even be able to instantly inform how the construction phase of a building is unfolding—on the ground, in real time. Upjohn grant recipient Mike Silver, an assistant professor of architecture at the University of Buffalo, leads a research team that is developing an “augmented reality tool” based on Google Glass-type eyewear that would have 3D scanning capabilities—facilitating the rapid assembly of masonry structures. The prototype would be wirelessly linked to Building Information Modeling (BIM) and allow architects and contractors to share data and make decisions quickly. The result? Silver’s term: “augmented craft.”

“After the failure of Google Glass, a lot of people were trying to figure out more-appropriate applications for augmented reality hardware,” Silver says. “Instead of bringing this technology to a bar, it seemed more natural to use it for specific work-based applications. The isolation of BIM for the day-to-day activities of the jobsite is problematic. Bringing BIM to the construction site and the construction site to BIM is an obvious next step.”

Silver and his collaborators, Karthik Dantu and Nils Napp, are currently working with robotics experts to test how this technology could be combined with semiautonomous robots on a jobsite to see where some greater efficiencies in construction might occur. At the same time, Silver is cognizant of how such technologies might affect the trades.

“There is a real fear that many jobs will be wiped away by automation,” he says. “I worry about this too, so we are trying to design systems with the artisan in mind. We don’t want to undermine human skill. We want to find better ways to help [workers] do the dangerous, dirty, and difficult jobs in a more efficient and safe way.”

That said, the hand of the architect and the hand of the user are, together, integral to shaping the success of architecture over time—how buildings and spaces address the motivations, behaviors, and challenges that define not only a building’s program, but also architecture’s reason to exist. **AIA**

“There’s ... a gap between intention and behavior that led me to study the role architecture plays ... as an actor in people’s lives.” —Julie Kriegh, AIA

→ Learn more about the Upjohn Research Initiative, and other initiatives, at [aia.org/practicing/research](http://aia.org/practicing/research).



# AIA Design

PHOTOGRAPHY: ANICE HOACHLANDER/HOACHLANDER DAVIS PHOTOGRAPHY



## Building Permanence

**La Casa supportive housing lends a hand to disadvantaged Washingtonians.**

It's no surprise to see a fancy new apartment complex rising in Washington, D.C.'s Columbia Heights neighborhood. In tandem with the 14th Street Corridor located several blocks south, this is a burgeoning community in a city that has seen more than 87,000 new residents in the last year alone.

But the building at 1444 Irving Street, NW, isn't another condo-heavy edifice aimed at affluent Millennials—with in-building gyms, in-unit washer/dryer stacks, and festooned roof decks. Instead, this is the first new-construction permanent supportive housing project for the District's Department of Human Services (DHS), which serves largely disadvantaged Washingtonians looking for a toehold in an otherwise booming city.

Known as La Casa, the project is part of a supportive housing movement that is garnering increased amounts of attention in both architectural and homeless care circles. The Star Apartments in Los Angeles, designed

by Michael Maltzan, FAIA, and created with the intention of providing respectable, well-designed housing for the city's jam-packed Skid Row, has defined the movement in architectural circles to date and, in some ways, set a standard for what's possible when high design meets a critical urban need.

La Casa follows the same trajectory. Developed as a joint venture by Studio Twenty Seven Architecture and Leo A Daly, and commissioned by D.C.'s DHS and Department of General Services (DGS), it contains 40 furnished, single-occupancy units for homeless men with on-site access to supportive services.

It's a compact structure on track for LEED Gold certification, with a green roof that also functions as a stormwater management device. Art inspired by the experiences of the residents adorns the walls of each floor's elevator lobby, which are larger and more well-lit than usual to encourage community. From its carefully constructed guts to the psychological impact of its layout, it's meant to provide stability and comfort for people lacking both.

"In terms of image, DHS and DGS asked us to design a project that is on par with market-rate housing," said Jim Spearman, La Casa's project architect at Studio Twenty Seven. "The image is very explicitly not that of a homeless shelter; it's of a permanent housing building."

And La Casa is indeed meant to be permanent housing. In a nod to the micro-housing movement, the smallest unit comes in at 300 square feet but still manages to pack in a tiled bathroom, kitchen, living area, bed, and storage. The rooms are supplied with tables and chairs, and equipped with utensils, pots, pans, and other cooking necessities.

Pair that interior with a modern, window-heavy exterior that alternates two different types of glass to balance solar heat gain and visible transmittance and you've got a building light-years beyond what is typically regarded as supportive housing.

"We had someone from the mayor's office present renderings, and we said, 'Now tell us which one is the homeless shelter.' And



# AIA Design

CONTINUED

they picked every one but our building,” said Lisa Franklin-Kelly, capital and operations manager at DHS.

Each unit is subtly unique, with a slightly raised ceiling here or a repositioned window there, all of which adds a sense of individualization that Spearman is hoping resonates with the residents. “The question we tried to answer is ‘How do you do mass housing when what you really want is to have a unique place for each person?’” he said, “and we wanted to find those design elements that make each unit special.”

What unifies the units most is the light. Windows, mirrors, and exposed areas abound; the hallways are adorned with LED fixtures that start up quickly, over a period of one second, so as to recognize and beckon newcomers. And the rooms, in particular, are open and airy, designed to receive as much natural light as possible. “During the day, you don’t have to turn on the lights if you don’t want to,” Spearman said.

From a design perspective, La Casa is a testament to what can happen when architects and civil servants strive for the same goal. And it’s a strong step forward for the permanent supportive housing movement in general; while DHS officials noted that there are no current plans for another building of this sort, similar initiatives are being explored for both families and individuals. For now, La Casa’s continued presence can only reinforce the growing notion that all people deserve access to quality housing. **AIA**

Steve Cimino



# AIA Perspective



PHOTOGRAPHY: CARL BOWER

## A Tacit Admission

### Knowledge comes in different forms.

*Ex Machina* is the latest Hollywood film to raise the alarm about the alleged threat posed by artificial intelligence. As a member of a knowledge-based profession, I ought to be nervous about being replaced by a robot or at least an app. I’m not.

Experience suggests there is not one kind of intelligence or knowledge, but at least two. On one hand, explicit knowledge is the outcome of research and experimentation. It can be tested and, most importantly, replicated. It lends itself to textbook precision. Having access to this kind of knowledge about resiliency, health, aging, and urbanization—to cite just a few things—opens the way for architects to participate credibly with other professions, industry, and government whenever these issues are discussed.

Tacit knowledge is different. Typically instinctive, subjective, and perhaps even imprecise, you can’t transmit it to someone through a book or a conversation. Tacit knowledge informs your decisions and frames your perspective on the world—and thus it is no less essential than explicit knowledge for architects or anyone else.

It’s this tacit knowledge that separates us from machines—the thing that empowers us to

make decisions that are based on compassion as much as they are based on logic.

I recall the care given by a physician to a family member of mine who was gravely ill from mesothelioma. Morphine had been given to ease his pain, but the drug had left him unresponsive. Should a feeding tube be inserted to prolong the inevitable, or should nature be allowed to take its course? No one in the family wanted to make that decision.

The doctor, a friend of many years, came by the house to visit his patient. He sat by the bed and began by gently asking the dying man if he recognized him, then quietly and gently spoke of their long friendship and significant events in the patient’s life—his marriage, his children, and his grandchildren.

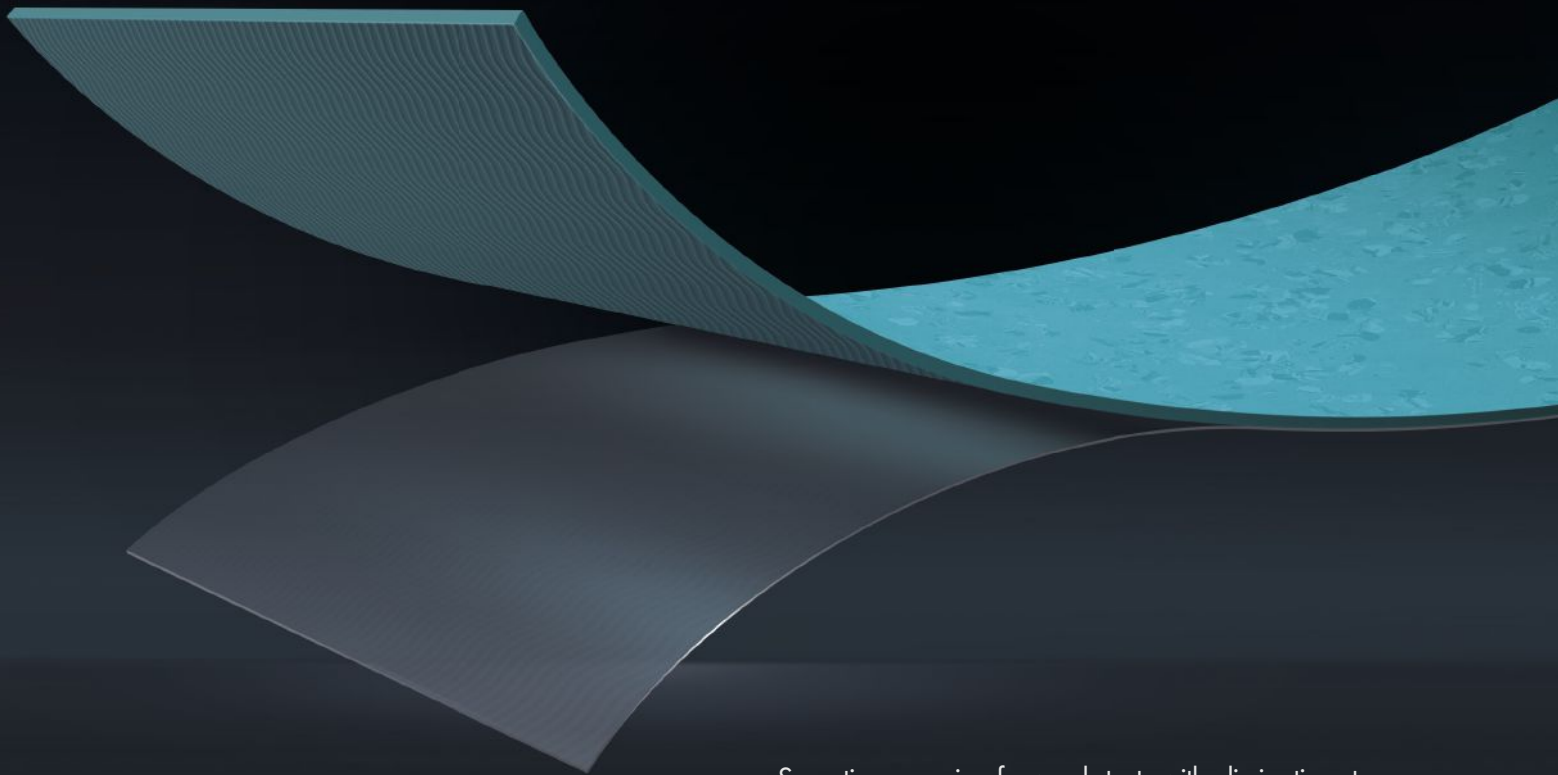
Gradually the dying man began to speak with those of us gathered around his bed. His words had a clarity he had not shown in weeks. Eventually he made the decision himself not to have a feeding tube inserted.

There’s no doubt that the doctor struggled to reconcile what he knew from years of study about prolonging his patient’s life, and what he knew in his heart about the importance of listening to his patient’s wishes. Tacit knowledge comes from a lifetime of listening to the needs and dreams of those we serve. It’s the wisdom that gives lasting and meaningful value to our work. **AIA**

Elizabeth Chu Richter, FAIA, 2015 AIA President



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# ARCHITECTURAL STONE VENEER

## STYLE AND SUBSTANCE

Presented by:



By Paige Lozier

### OVERVIEW

There is a unique intersection that exists between nature and design where the artists of our world engage in dreaming and designing the spaces where we work, live and entertain. There is a commitment to authenticity, where believability matters. Architectural stone veneer walls are handcrafted by artisans to a level of precision rarely seen, with the unbridled ability to design the unimaginable.

Throughout human history, stone in architecture has represented a level of substance and style unmatched by other building materials. Architectural stone veneer continues that tradition without the negatives associated with stone quarried from pits in the earth. With architectural stone veneer, you as a designer have the full range of style, color and aesthetics at your fingertips, without the troubling doubt that the choices you make are

bad for the environment. This learning unit examines the multitude of choices you have in architectural stone veneer, when and where to specify it, along with tips on best installation and maintenance practices. The nearly limitless range of options for specifying architectural stone veneer will bring new inspiration into your design practice. What memorable spaces will you create?

### KEY ATTRIBUTES OF HIGH QUALITY STONE VENEER

Let's start off by looking at the key elements of a high quality architectural stone veneer. Stone evokes some of the world's most meaningful and powerful historical structures, from the Parthenon in Greece to the stone castles in Europe and monasteries throughout Asia. From the Washington Monument to Mount Rushmore, the power of stone is etched on our souls.

### LEARNING OBJECTIVES

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

1. Describe key elements of architectural stone veneer.
2. Discuss design considerations for stone veneer applications of all styles and environments.
3. List the benefits of stone veneer.
4. Explain basic installation considerations and the impact of grouting methods.

### CONTINUING EDUCATION

CREDIT: 1 LU

COURSE NUMBER: ARJune2015.1

Use the learning objectives to the right to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit <http://go.hw.net/AR615Course1> and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.



Photo courtesy of Eldorado Stone

The importance of selecting a quality product to evoke the power of stone cannot be overemphasized. Look for the following attributes when specifying architectural stone veneer: natural surface texture, high quality materials, natural color appearance, stone profile assortment and extensive stone styles. When considering a product, also ask yourself these questions: Is the product authentic and believable? Does it look real? Does the company use high quality materials when manufacturing? Is there an extensive selection? What is the warranty period and details of the warranty?

Originating from Mother Nature, architectural stone veneer takes shape beginning with a single natural stone. Craftsmen sort through tons of stone, piece by piece, selecting only the rocks that complement each other and have just the right shape, texture, size and detail. Specialty molds are fabricated from the natural stone selection and are able to capture every



textural detail down to the most finite level. Work with manufacturers who invest in high quality molds and have a dedicated process to replace molds often, as this will guarantee the textural details remain true and accurate to the original natural stone.

The quality of the materials inside an architectural stone veneer is equally as important as its appearance. High quality stone veneer companies have completed the appropriate ASTM and ICC testing requirements, which guarantees that the stone will meet code requirements and have the durability and strength to last a lifetime. Be sure to work with companies that offer a 50-year warranty.

Natural color hues are formulated and multiple layers of color oxides are hand applied to **each individual stone**, creating an extremely “believable” appearance. The hand applied process guarantees no two stones look alike. Furthermore, by applying multiple layers of oxides to each stone, the depth of color hue creates a more natural appearance.

One of the most important factors in selecting an architectural stone veneer is confirming the company uses an extensive selection of stones within each profile. This means you won’t see the same stone shape repeat in a small space multiple times, which can look very fake and aesthetically unpleasing. High quality manufacturers invest more in multiple molds and also replace the molds often to guarantee the texture stays true to nature’s original intention.

### APPLICATIONS BY ARCHITECTURAL STYLE

To achieve the authenticity and believability that is critical for architectural stone veneer applications, designers should specify stone profiles consistent with the project’s geographical location, or with the home’s architectural vernacular. In other words, the limitless applications of stone can reflect either indigenous stone profiles, or the stone that would be compatible with the home’s architecture, from old world traditional to modern stone fusion. There are many architectural styles and equally numerous types of stone, so we’ll just discuss a few to give you an idea how a particular type of stone can complement a particular architectural style.

#### Georgian Style

The design of this two story Georgian Style home employs a generous amount of architectural stone veneer. The symmetrical arrangement of the windows, centered door, wood trim, columns and white exterior accurately represent the popular style found in buildings throughout the 18th century and beyond. The earthy color palette of the field ledge is reminiscent of natural field stones often found on the grounds of properties during construction.

Field ledge is a hybrid of horizontally oriented fieldstones and ledge stones with heights from 1.5 inches to 15 inches and lengths from 5 inches to 18 inches. The stone’s old world quality and smoother face transitions between a rustic look and an articulated ledge. Field ledge’s color

palettes range from cool to warm gray blends. Its sepia base and raw linen color is complemented by subtle khaki-greens and olives, warm ochres, chestnut browns and raw umber.



This waterfront New England home, designed by Ballard and Mensua Architecture, features an architectural stacked stone as the predominant foundation. Photo courtesy of Eldorado Stone

#### Coastal Style

This waterfront New England home, designed by Ballard and Mensua Architecture, features an architectural stacked stone as the predominant foundation. The stacked stone applied was an architectural stone veneer that had been molded into a panelized system. The panelized stone saved significant cost in labor and provided the aesthetic appearance of a tightly laid ledge stone. Stacked stone was utilized as the foundational element of the 3-story glass tower aptly named the “Sunrise Tower”. This anchored the design and provided the signature architectural element to capitalize on the stunning views of the New England coastline.



Many modern homes take their cues from Frank Lloyd Wright whose organic designs featured natural materials such as wood, stone and clay. Photo courtesy of Eldorado Stone



The earthy color palette of the field ledge is reminiscent of natural field stones often found on the grounds of properties during construction. Photo courtesy of Eldorado Stone



Stacked stone embodies the classic elegance and intricate detail of small stones combined with the simplicity of a panel system. The stone gives the appearance of a precision hand-laid dry-stack set. Stones 4 inches high and 8 inches, 12 inches and 20 inches long make installation easy for expansive walls and column fascias alike.

**Modern Style**

Modern architecture is the term used to describe the simplified, unornamented building styles of the late 19th and the 20th centuries. Many modern homes take their cues from Frank Lloyd Wright; his forward-thinking designs focused on organic design with the use of natural light and natural materials such as wood, stone and clay. As seen in this modest yet contemporary design, a split face travertine was applied to the exterior. The use of the stone from the foundation to the roof line adds to the overall authenticity of a structural masonry wall. The long linear split face travertine installed at 3 inch heights and varying lengths of 12 inches, 18 inches and 24 inches creates visual interest and organic texture to the home's exterior.



The extensive use of stone, specifically the rustic rubble blend combined with a heavy overgrout application, replicates the centuries old dwellings found in Europe. Photo courtesy of Eldorado Stone

**Tuscan Style**

The Hideaway Home, designed by Architect Frank Stoltz of South Coast Architects in Newport Beach, created the warmth of Tuscan architecture in the desert setting of La Quinta, CA. "The vision that South Coast Architects set forth was to create the feel of an old Tuscan village keeping in mind a design reflective of a desert lifestyle, which meant an emphasis on indoor/outdoor living spaces," says Stoltz. The extensive use of stone, specifically the rustic rubble blend combined with a heavy overgrout application, replicated the centuries

old dwellings found in Europe. The rustic rubble blend uses a combination of irregularly shaped stones including both irregularly shaped rubble and ledgerstone pieces. Colors range from sundrenched golds, earthy browns and faint olive greens offset with rust-colored accents to give each stone its own story to tell.



Adding architectural stone veneer to office buildings immediately creates classiness and substance. Photo courtesy of Eldorado Stone

**DESIGN CONSIDERATIONS FOR STONE VENEER APPLICATIONS**

Now that you've seen how a certain style of stone can complement a specific style of architecture, let's move on to discuss design considerations for stone veneer applications in all styles and environments.

Architectural stone veneer is a natural choice for exterior enhancements to a building.



Specifying architectural stone on institutional buildings adds warmth and natural beauty that can sometimes be lost in such projects. Photo courtesy of Eldorado Stone

Stone gives a building presence, elegance and substance and makes a powerful architectural statement. Adding architectural stone veneer to office buildings immediately creates classiness and substance. In this example you see a cliff stone installed with a dry-stack technique. Notice how the stone highlights the architecture of the building emulating a strong foundational sense of structure.

Architectural stone veneer is often selected for hospitality projects for its ability to bring a calming and natural element to any environment. The texture and limitless color options allow design flexibility to create unique spaces that can transport us to a different time and place, recapturing our connection with nature.

Specifying architectural stone on institutional buildings helps to overcome the cold, hard appearance endemic in such buildings, adding warmth and natural beauty that can sometimes be lost in such projects. Notice in this institutional building application the generous use of corners and deep window wells. Using stone veneer on corners provides the impact of full-dimension natural stone and adds to the overall realistic appearance.

**CASE STUDY**



Temecula Library, Temecula, CA Photo courtesy of Eldorado Stone

The Temecula Library is built on a hilltop overlooking a suburban community of the same name in Southern California. The Temecula Valley, or "Valley of the Filtered Light" as the Indians called it, is known for its granite quarries, hot-air balloons, wine festivals, and the highly influential heritage of the Pechanga Indian tribe. Architect Jim Wirick, Principal at LPA Inc., wanted to specify a substantial amount of stone that was indigenous to the area. The economical option of architectural stone veneer was the clear choice, as it provided a cost-effective solution that not only met the budget restrictions for the project but also met the natural appearance of the indigenous stone of the Temecula Valley.





Bluff stone profile with dry stack grout gives the appearance that this home was built on a solid stone foundation. Photo courtesy of Eldorado Stone

Residential facades take on an established and substantial aesthetic with the simple addition of architectural stone veneer. In this example, a bluff stone profile with a dry stack grout technique ties together the multi-level home, giving the appearance that this home was built on a solid stone foundation.



The preferred look of a masonry fireplace is accomplished at a fraction of the investment compared to natural stone. Photo courtesy of Eldorado Stone

There has been a growing trend to create unique outdoor living spaces, both in residential and commercial applications. Because of all the advantages of architectural stone veneer it has become the preferred material for this coveted space. In this example, the preferred look of a masonry fireplace is accomplished at a fraction of the investment compared to natural stone. This is just one more demonstration of the range of exterior applications stone is capable of achieving.

## QUIZ

- Which of the following attributes should you look for when specifying architectural stone veneer?
  - Natural surface texture
  - High quality materials
  - Natural color appearance
  - Stone profile assortment
  - Extensive stone styles
  - All of the above
- True or False: Architectural stone veneer is cast from molds of real stone
- True or False: High quality manufacturers use the same molds over and over to ensure consistency.
- Which style of stone below is correctly matched with the appropriate architectural style?
  - Georgian and Field Ledge
  - Tuscan and Field Ledge
  - Modern and Stacked Stone
  - Coastal and Rustic Rubble
- True or False: Split travertine is often used with Modern Style homes.
- Architectural stone veneer is approximately \_\_\_\_ the weight of natural stone.
  - 1/2
  - 1/3
  - 1/4
- True or False: Architectural stone veneer is not recyclable.
- True or False: Architectural stone veneer is not intended as a structural product or a waterproofing element.
- Which of the following is not an acceptable wall substrate for the application of architectural stone veneer?
  - Existing siding in unsound condition
  - Exterior insulation finishing system (EIFS)
  - Deteriorating or unsound masonry surfaces
  - All of the above
- Which of the following grout techniques results in grout that overlaps the face of the stone, widening the joints and making them very irregular?
  - Dry-stack
  - Overgrout
  - Standard grout

For architectural stone veneer to fulfill its potential as an accent, it needs to appear authentic. The key is to specify stone styles and colors that are either natural to the region, or to the style of the building. It needs to look structural, rather than superficial. That falls to the designer to specify the stone in logical locations such as the base of a wall, on columns, and on fireplace surrounds.

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“Aalto was a self-styled functionalist who referred to Paimio as a ‘medical instrument,’ and he designed the building as purposefully as a scalpel.”

Michael Graves used to tell a story about what sparked his interest in healthcare. He recounted waking up in a hospital bed in February 2003 after collapsing from a spinal cord infection that left him paralyzed from the waist down, and staring up at the acoustic tile and fluorescent lights of a banal suspended ceiling. “I can’t die here,” he said to himself. “It’s too ugly.” He devoted the next dozen years to the design of hospital furnishings. Earlier this year, Graves passed away in the familiar surroundings of the Warehouse, his distinctive Princeton, N.J., home.

Hospitals are depressing places. They are settings for intensely personal experiences, yet they are anonymous and impersonal; they are refuges for the sick and dying, yet they are full of alienating machinery; they are places of purposeful activity, yet the atmosphere is one of anomie and boredom. These are public buildings whose occupants would rather be elsewhere; the first thought of most people entering a hospital is, “How soon can I go home?” As Graves observed, soulless architecture doesn’t help. My local hospital has all the charm of a suburban Holiday Inn. Too many healthcare facilities built today are uninspired and generic, plain vanilla designs without architectural ambition or attention to detail.

It could be otherwise. The bar for modern hospital design was set more than 80 years ago by the landmark Paimio Sanatorium, which is the subject of an exemplary new monograph edited by Esa Laaksonen, the director of the Alvar Aalto Academy in Finland. *Alvar Aalto Architect Vol. 5: Paimio Sanatorium 1928–33* (Rakennustieto Publishing, December 2014) includes a history of tuberculosis sanatoria in Finland and elsewhere, background on the building, selected sketches and working drawings, recent views, archival photographs (Aalto on the construction site in plus-fours), and a useful description of other projects that his office was engaged in while working on Paimio (including a little-known competition entry for a large hospital in Zagreb).



View to the entrance of Paimio

The monograph is part of an ambitious series, projected to be 28 volumes (six have been released so far) that will provide a comprehensive record of Aalto’s architectural and planning work. Anyone interested in the Finnish master will want this set.

#### How Paimio Led to Aalto’s Rise

Completed in 1932, Paimio Sanatorium is located in a forest in southwest Finland, outside the city of Turku, where the young Aalto—he was only 30 when he started work on this project—had his office. The client was a federation of local municipalities, and the project was the result of a competition—there were 13 entries. Aalto’s spread-out plan owes a debt to the Dutch modernist Jan Duiker’s Zonnestraal Sanatorium in Hilversum, which Aalto visited shortly before the competition. Because tuberculosis is highly contagious, sanatoria had to be self-sufficient. Paimio was organized in discrete wings, each housing a specific function: south-facing patients’ rooms; open-air sunning terraces; an entrance lobby, stairs, and elevators; communal spaces (library, lounge, hobby room), doctors’ offices, and treatment rooms; and service areas (kitchen, bakery, laundry). Staff housing was in separate low-rise structures.

In the second edition of *Space, Time and Architecture*, published in 1949, Sigfried Giedion judged Paimio to be among the “three institutional buildings inseparably linked to the rise of contemporary architecture” (the other two were Walter Gropius’ Bauhaus at Dessau, and Le Corbusier’s proposed League of Nations Palace in Geneva). An interesting detail revealed by the Paimio monograph: the competition rules imposed a height limit of four floors. Shortly after the winner was announced, the program was enlarged from 186 to 286 beds. Aalto’s solution was to simply add two floors (and a roof terrace) to the patients’ wing, turning a horizontal scheme into a distinctly vertical one. The result was a modernist slab lyrically poking out of an Arcadian pine forest. One wonders if Giedion’s appraisal would have been the same had the building been shorter.

Paimio established Aalto as a major figure in the modernist movement. The exterior incorporated all the de rigueur hallmarks of the International Style: ribbon windows, white plastered walls, flat roofs, dramatic cantilevers. In fact, most of the structure was distinctly conventional: a commonsense short-span concrete frame with a flat slab and brick infill. This modernist icon “was erected without machinery—simply by man and horse power,” as the monograph wryly notes.

It is the interior of the sanatorium that is the most impressive. No detail escaped the Aaltos’ attention (Alvar’s architect-wife Aino was his active



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collaborator). They designed the lighting fixtures, the clocks, and the opening mechanisms for the windows. Even special door handles that would not catch on doctors' lab-coat sleeves, anticipating Aalto's lifelong fascination with door hardware. At Paimio, the push/pull bars of the dining hall doors were tubular steel, but the touched portions were ebony. Similarly, the handrails of the stair balustrades—steel pipes in most International Style buildings—were wood. The detailed architectural drawings for the sanatorium were the work of only six people: Alvar and Aino, assisted by two Finnish and two Norwegian architects.

The Aaltos were responsible for all the furniture: tables, easy chairs, library chairs, and outdoor recliners for the patients; side chairs for the staff dining room; chairs and desks for the physicians' offices; stools for the laboratory. Best-known is probably the so-called Paimio Chair, a patient's lounge chair that uses curved plywood for the seat and steam-bent birch for the supporting frame.

Until antibiotics were discovered, tuberculosis was treated by exposure to sunlight and fresh air—at Paimio, ambulatory patients could go up to the roof terrace, others could be assisted to the sunning terraces that were directly accessible from each floor. The outdoor terraces were oriented due south, but the patients' wing—single-loaded so that all the rooms received sunlight—was turned slightly southeast to maximize sun in the mornings and reduce it in the afternoons. Most of the rooms were double occupancy. Heating was by means of flat radiant panels on the ceiling, to minimize drafts. The individual washbasins were designed to reduce splashing noise. Wardrobes of curved plywood were fixed to the wall and raised off the floor to facilitate cleaning. The ceiling was painted



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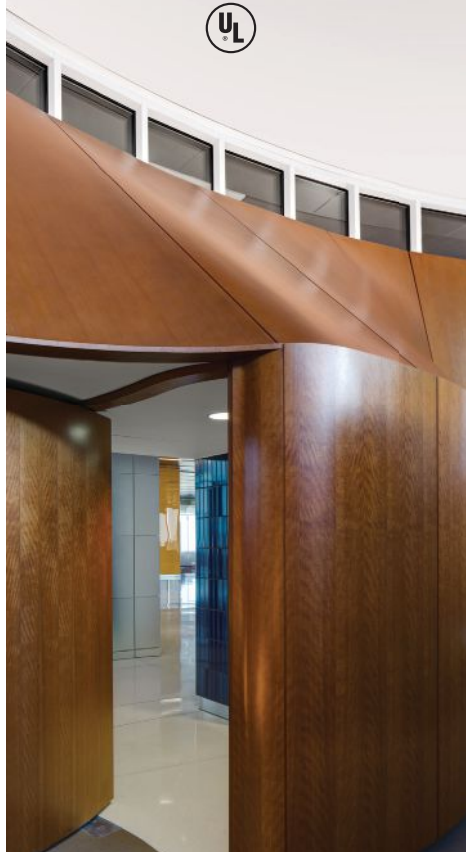


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Lounge with Paimio Chairs



Patient room

a restful dark green and the linoleum floor was brown. Brighter colors were used in public areas, though not the cloying “cheerful” colors that are common in so many hospitals today. The stairs and hallways were warmed in the cold winters by canary yellow rubber-coated floors; doors were teal green. The windows of the doctors’ wing were shaded by colorful canvas awnings.

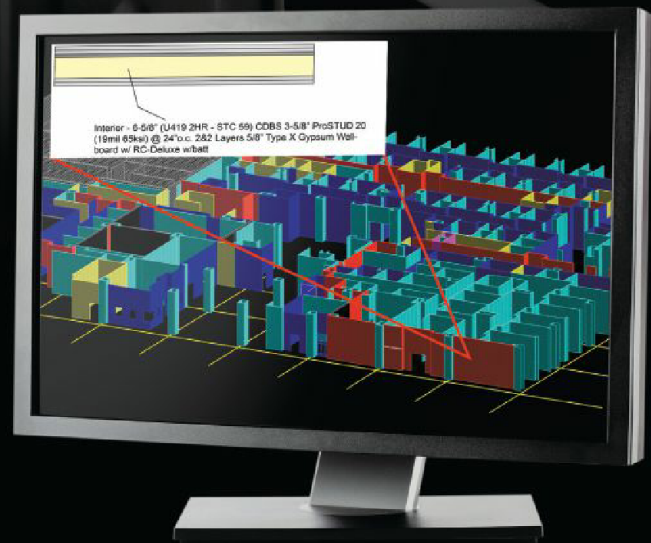
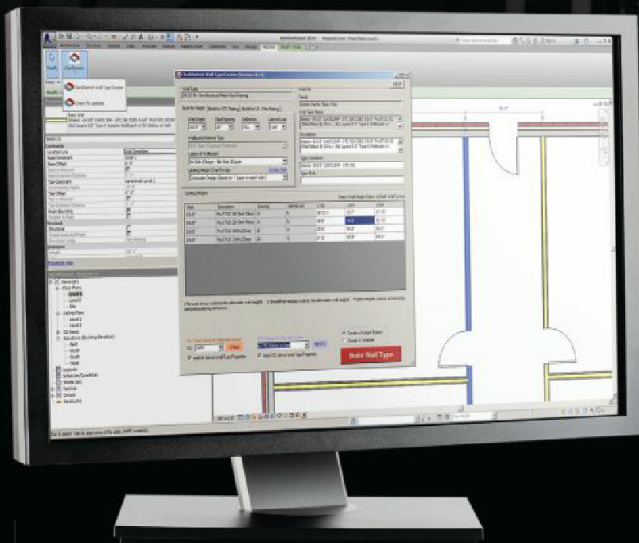
**Designed with the Patient in Mind**

Aalto was a self-styled functionalist who referred to Paimio as a “medical instrument,” and he designed the building as purposefully as a scalpel. But his architecture was grounded in a profound humanism. The sanatorium is the least formalist of buildings and it functioned well, but one never has the feeling that it was designed for the benefit of the doctors or administrators, or even the cleaning staff, like so many modern hospitals. The well-being of the individual patient was paramount. “The room design is determined by the depleted strength of the patient, reclining in his bed,” Aalto was quoted as saying in Göran Schildt’s *Alvar Aalto: The Complete Catalog of Architecture, Design and Art* (Wiley, 1994). “The color of the ceiling is chosen for quietness, the light sources are outside the patient’s field of vision, the heating is



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oriented towards the patient's feet, and the water runs soundlessly from the taps to make sure that no patient disturbs his neighbor."

The Paimio monograph includes a description of the changes that have been made to the building since

it opened in 1933. Like all hospitals, Paimio has undergone periodic upgrading and technical improvement, as well as regular maintenance and repairs. It is a credit to the administration that the Aalto office was kept involved until Aino's death in 1994. This does not mean that the

landmarked building was treated with kid gloves. When the sanatorium was converted into a general hospital in the 1960s, the open sunning decks were enclosed, and a new wing containing operating rooms was added. Today, Paimio serves as a rehab center for children and young people. What is most impressive is that in its 80-plus years, the building has never ceased to function as a healthcare facility. Tellingly, modifications were implemented so as to preserve the underlying spirit of Aalto's design.

"While the changes required by the hospital operations have been carried out so as to ensure maximum functionality where possible, each individual detail has been implemented in a way that helps move closer to the original solutions," points out architect Ola Laiho, whose firm has been responsible for repairs and modifications to Paimio since 1996. In other words, the hospital buildings have been treated as valuable architectural heritage, not as pieces of medical equipment to be discarded and replaced, like an outdated X-ray machine.

Aalto had no hospital experience when he designed Paimio. In fact, it was his first large commission; his major previous project had been a small newspaper plant in Turku. But perhaps that was an advantage. He was not an expert with a kit bag of preconceived, pre-packaged solutions. Instead, with the benefit of medical advice, he reasoned his way through each problem. In a 1998 essay for a Museum of Modern Art show about Aalto, the Finnish architect Juhani Pallasmaa, HON. FAIA, wrote that the Paimio building "exudes a rare atmosphere of optimism, healing and inspiration." That, surely, is what *all* hospitals should manifest.

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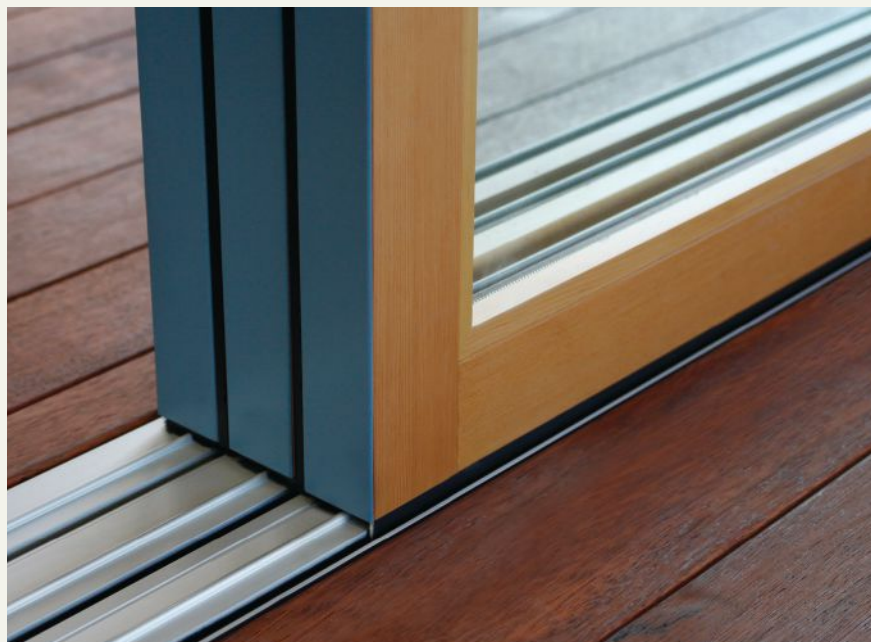
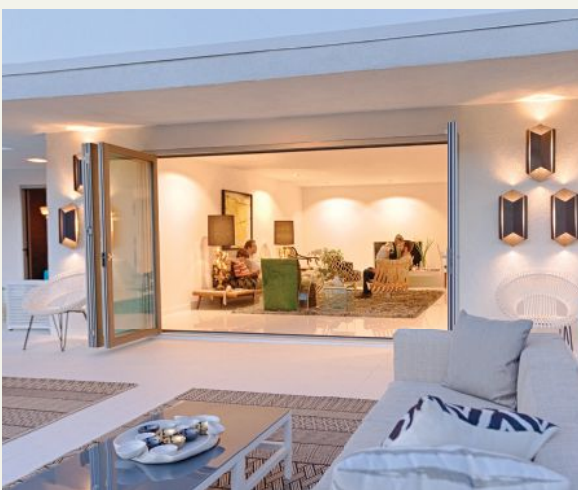


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I attended the  
symphony, felt sad  
and charmless, like a  
dying shopping mall.”

It was a good idea at the time. Downtown Denver in the early 1970s was down on its heels, suffering from the aftereffects of urban renewal and losing office workers to the growing suburbs—the same scenario then playing out in cities across the country. On most nights, downtown streets were all but deserted. The Denver Symphony Orchestra, which performed in a converted Beaux-Arts auditorium first used for the 1908 Democratic National Convention, still attracted crowds, as did the city’s American Basketball Association team, the Denver Rockets, who played next door at the Auditorium Arena. So why not take the existing buildings, add a concert hall, a theater complex, and a parking garage, and tie it all together with a barrel-vaulted glass roof? That was the proposal from a group of visionary political and cultural leaders, including then *Denver Post* publisher Donald Seawall and former Mayor William McNichols Jr. This group envisioned a world-class performing arts center that would entice more suburbanites to visit the city and bring life back to downtown.

When it opened in 1979, the 12-acre Denver Center for the Performing Arts (now the Denver Performing Arts Complex, or DPAC) was widely praised for its innovative design and location. It was a self-contained urban arts complex in the mold of Lincoln Center, the Kennedy Center, and the Los Angeles Music Center—but as conceived by Kevin Roche John Dinkeloo and Associates, Denver’s version was less monumental. Paul Goldberger, HON. AIA, writing in *The New York Times*, called the theater complex “stunning” and “remarkably ambitious.” But he picked up on a major design flaw: “The emphasis on the automobile makes it hard to tie the center to what little pedestrian activity does in fact exist in Denver. There will be shops on the ground floor of the garage, but since the Galleria-Plaza is one level above grade, there is not much relationship to the rest of the city.”

Still, the performing arts center lived up to its initial critical acclaim, both artistically and economically. In the 1980s, as downtown Denver continued to struggle, the complex proved to be a major draw for city dwellers and suburbanites alike. That’s still true. In 2013, according to an economic impact study, more than 781,000 patrons attended performances and events at DPAC. Of those, 77 percent came from outside the city. DPAC’s total impact on Denver’s economy, according to the study, was estimated at \$141 million a year.

More than 35 years after it first opened, however, DPAC is showing its age. As the city booms—since 2000, Denver’s downtown population has increased from 7,000 to 19,000, with more on the way—the complex, though still popular, has become something

of an urban design relic. With help from New York-based H3 Hardy Collaboration Architecture, city officials are in the process of reimagining the center. A master plan is due by the end of the year. It’s a complicated, politically charged assignment, but if done well, will bring a new center of vitality to downtown Denver.



#### Perfect for its Time

A Denver resident, I have gone to concerts and plays at DPAC for years, but I wanted to take a fresh look at the place. So, on a recent Friday evening, I took a seat at one of the few benches inside the galleria, the plaza beneath the 80-foot-high glass archway. It was a busy night at the “Plex,” as locals call it. The 2,839-seat Buell Theatre, converted from the old Auditorium Arena in 1991 and used mostly for traveling Broadway musicals, was showing “Motown the Musical.” The 550-seat Space Theatre was hosting a play called “One Night in Miami ...” The 778-seat Stage Theatre was putting on a rock musical called “The 12.” The Ellie Caulkins Opera House, known as the “Ellie,” which opened in 2005 after an extensive renovation of the 1908 auditorium, had the night off.

There was a pleasant buzz as patrons—young and old, some dressed up, others wearing jeans—made their way to the various theaters. In a city that still struggles with the concept of density, people actually brushed up against one another. DPAC may be in need of reimagining, but on performance nights, it’s as vibrant as ever.

I attended a performance of the Colorado Symphony at Boettcher Concert Hall. Visiting conductor Cristian Măcelaru led the orchestra in works by Haydn and Shostakovich, with concertmaster Yumi





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Hwang-Williams playing Beethoven's sublime Violin Concert in D major. By my estimate, about half of Boettcher's 2,679 seats were occupied.

Designed by Hardy Holzman Pfeiffer Associates (the predecessor firm to current master planners H3 Hardy), Boettcher was the first concert hall in the nation with "in the round" seating. The boxy, beige-brick venue opened to much fanfare in 1978, one year before the rest of the performing arts center was completed. Boettcher was a key element, along with a concrete-and-glass theater complex designed by Roche Dinkeloo. Both buildings remain striking examples of 1970s civic architecture.

The same can't be said of the center's massive, five-level parking garage, which occupies an unfortunately prominent site at the corner of Arapahoe and 14th streets. In the 1970s, it was one of DPAC's major selling points, allowing patrons to walk safely and conveniently from their cars to their seats without ever setting foot on a city sidewalk.

DPAC was "perfect" for its time, says Jeremy Németh, associate professor and chair of the Department of Planning and Design at the University of Colorado Denver. (The city's 16th Street pedestrian mall, designed by I.M. Pei & Partners and completed in 1982, was another attempt to revive the urban core.) "But DPAC feels out of place today," Németh says. "And it's basically used four hours a night, maybe five days a week."

Indeed, during the day, and on nights when all of the theaters are dark, DPAC is a dead zone. I returned a few days later on a weekday. It was lunchtime, but over a 30-minute period, I counted only a handful of people in the vast galleria space, which is roughly 600 feet long and open to the elements on both ends, and most of them seemed to be at DPAC solely to purchase tickets for future performances. The plaza, so alive on the evening I attended the symphony, felt sad and charmless, like a dying shopping mall. There were no plants, no water fountains, no food carts, no kiosks. In one particularly barren section, rusted rebar was showing through cracked concrete. Piped-in classical music—Holst's "The Planets," conducted by Leonard Bernstein—played softly, but it only called attention to the fact that the space was utterly lifeless.

I was reminded of something Jane Jacobs said about Lincoln Center in a 1958 speech at the New School: "[It] is planned on the idiotic assumption that the natural neighbor of a hall is another hall. Nonsense. The natural neighbors of halls are restaurants, bars, florist shops, studios, music shops, all sorts of interesting places."

DPAC wasn't supposed to be this way. When ground was broken in 1975, *Washington Post* architecture critic Wolf Von Eckardt gushed that it "promises to be an exciting environment, a building complex where the function takes over, where the architecture serves as background for the performing arts, for the flowers, trees, street clocks, fountains, benches and other things that are to furnish the mall, for the view from the mall and for the people who will enjoy it."

And when Boettcher opened in 1978, a commemorative booklet promised that the still-under-construction galleria "will soon offer sidewalk cafés, restaurants, and shops," and its "park-like atmosphere ... will form a relaxed and inviting setting for downtown shoppers and theater patrons."

Today, the only retail space in the galleria is a small shop called Dandoo's Fine Imports, which sells clothing and fabric from India and Nepal. Limelight Supper Club & Lounge is often packed before performances, but otherwise sits empty. Another restaurant, Kevin Taylor's at the Opera House, is open only on nights when there are events at the Ellie, the Buell, or Boettcher. Backstage Coffee, on the ground floor of the parking garage and facing 14th Street, is the exception: It is better connected to downtown and doesn't rely solely on DPAC patrons.

#### One of the Most Wrongheaded Ideas

How should DPAC be fixed? The debate began in earnest last year, when the Colorado Symphony—which, like many U.S. orchestras, has struggled



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financially in recent years—announced it might leave Boettcher and search for another home unless the city lowered the orchestra’s annual \$323,000 rent. The city council agreed to the cut. But then the *Denver Post* reported that the city’s Arts & Venues agency, which oversees DPAC, was considering tearing down Boettcher and replacing it with an outdoor amphitheater in nearby Sculpture Park, on the center’s western edge. The symphony, the agency suggested, could share the Ellie with Opera Colorado and the Colorado Ballet. (Not so easy, it turns out, given overlapping performance and rehearsal schedules.)

Michael Paglia, art and architecture critic for the Denver alternative weekly *Westword*, called it “one of the city’s most wrongheaded ideas in recent memory.” Boettcher, he wrote, is “an architectural gem” that helped put “a sleepy, midsized city” on the map. Fix it, but don’t demolish it.

In September, Jerome Kern, the symphony’s CEO, went on the offensive. He announced a “Build a Better Boettcher” plan that would preserve the concert hall but correct some of the flaws by decreasing audience capacity and incorporating a flexible seating system to allow for a variety of performance configurations. The \$40 million redesign was hatched by local architecture firm Semple Brown Design, working pro bono.

Denver Mayor Michael Hancock then went even further. He announced he was putting together a team of 29 “arts leaders, planning experts, and Denver residents” to “reimagine” not only Boettcher but the entire performing arts complex. “Think boldly,” he told them. Kern was among those given a seat at the table. Since December, the committee members have been gathering once a month.

At a meeting I attended in March, just after the city had signed the contract with H3 Hardy, firm principal John Fontillas, AIA, gave a brief presentation and then listened as committee members critiqued DPAC: The complex is too inward looking. It’s cut off from the surrounding neighborhood, including the Colorado Convention Center, a block away, and the nearby Auraria Campus, home to three colleges and universities. It doesn’t appeal to Millennials. It’s empty during the day. It’s ugly. How to fix it? Schedule more activities and events. Build a hotel or an apartment complex. Add more restaurants. Improve the signage. Enclose the galleria. Add space heaters. Change the name. Demolish the garage.

A few days later, I met Kent Rice, executive director of the city’s Arts & Venues agency, at DPAC. It was mid-day, and sure enough, the place was dead. Rice, who is also on the mayor’s committee, said he remembered coming downtown in the ’70s with

his father to see wrestling events at the Auditorium Arena. He echoed some of the comments I heard at the meeting. His vision for the center includes both programming and design changes. He’d like to draw a younger, more diverse crowd to the complex by offering performances and activities throughout the day. He’d like to see a private developer build a hotel or high-end condos on the property. (This would also help finance any redevelopment plan, which doesn’t yet have a price tag.) He wants to see more events at Sculpture Park, which sits between DPAC and busy Speer Boulevard.

Rice looks at the existing retail space in the galleria and imagines an Apple store. He longs for a smaller theater for music and dance concerts that might not



fill the Ellie, the Buell, or Boettcher. His agency is no longer talking about demolishing Boettcher, but he also makes it clear that the city’s original plan to spend \$17 million on infrastructure repairs doesn’t make sense as long as the concert hall is used only by the symphony and the seating capacity remains 2,679. Perhaps looking for cover, he adds, “If H3 comes



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back and says Boettcher should become a child care center—which is unlikely—we would certainly consider it.”

“The goal,” he continues, “is to concoct ways to get more people into this complex, either inside for performances or in the galleria or in the park, so that they start making this a more vibrant place.”

### H3’s “Tremendous Opportunity”

As a young architect with Hardy Holzman Pfeiffer, H3’s Fontillas was part of the design team that helped transform New York’s crime-ridden Bryant Park into one of the city’s most popular urban gathering spaces. He was also involved in the firm’s renovation of the Brooklyn Academy of Music’s Majestic (now Harvey) Theater, and he thinks its success in drawing a young, diverse audience to its innovative programs has relevance for Denver, a popular destination city for Millennials.

Fontillas also points to Diller Scofidio + Renfro’s \$1.2 billion makeover of Lincoln Center, which attempted to make the 16-acre cultural complex less fortresslike with the addition of green spaces, pedestrian-friendly street connections, a new fountain, improved signage, cafés, a destination restaurant, and free public Wi-Fi and concerts. (H3 designed a small theater, LCT3, that sits on the roof of Lincoln Center’s Vivian Beaumont Theater.)

Walking around Denver, Fontillas sees a lively, booming downtown full of bars and restaurants, bike lanes, light rail, and new hotels and apartment buildings, yet DPAC has somehow missed out on the action. The complex was designed as a kind of one-stop shop for arts and entertainment, but that’s

“God knows how long the symphony will be there, but to rip down a perfectly good building like Boettcher is bullshit.”

—Susan Barnes-Gelt, former Denver city council member

not how consumers of culture behave today. They want to have a different kind of experience, Fontillas says, maybe starting with drinks before the show, or dinner in a different part of downtown. And when the performance ends, they don’t necessarily want to rush to their cars and drive home. DPAC’s success in the future will depend on how well H3 re-integrates it with Denver’s urban fabric.

Reimagining DPAC, Fontillas says, isn’t just a matter of redesigning a dead space, adding a couple of new restaurants, and hoping people will





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come. “We like to say, ‘Start with the art. Start with the performance, the activity.’ And then you begin to shape the spaces to accommodate the programming.”

DPAC’s location, adds Fontillas’ colleague Steven Stainbrook, is a major asset. “There’s tremendous

opportunity here,” he says. “It’s a question of making better connections to existing street life. DPAC is an impressive facility despite all the complaints. There are a lot of cities that would die to have Denver’s problems.”

Still, *Westword*’s Paglia, an ardent preservationist, worries that DPAC could be transformed beyond recognition, particularly if a redevelopment plan ends up being funded through a public-private partnership (which seems likely). “There are some powerful private interests who want to make hundreds of millions of dollars off this deal,” he says, “and you can’t do that by just cleaning the place and maintaining it. You have to do things like build hotels.”

Former Denver city council member Susan Barnes-Gelt, who writes a monthly op-ed column for the *Denver Post*, agrees with Paglia that Boettcher should be preserved and reconfigured. “God knows how long the symphony will be there,” she told me, “but to rip down a perfectly good building like Boettcher is bullshit.” On the other hand, she isn’t opposed to the idea of putting a hotel on top of the concert hall.

The parking garage, meanwhile, is the one building that many observers would be happy to see get blown up. But since it supports one side of the glass canopy, the structure is likely to remain in some form. Barnes-Gelt’s idea for making it more functional: hang micro-housing units on it. (Denver’s residential real estate boom has led to soaring rents and a dearth of affordable housing.)

In the end, nearly everyone I talked to thinks DPAC’s flaws can be fixed. The general feeling is: Make the complex more appealing for those who currently use it, and turn it into a magnetic destination for those who don’t. “DPAC,” Rice says, “is a blank slate in a way. We have great assets. It’s in a terrific location. There’s no reason it can’t become something better.”



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Pictured: LEED Silver Marriott Marquis, Washington, DC



**Sean Collier Memorial  
Cambridge, Mass.  
J. Meejin Yoon, AIA**





TEXT BY COURTNEY HUMPHRIES  
PHOTOS BY IWAN BAAN



At the corner of Vassar and Main streets on the campus of the Massachusetts Institute of Technology (MIT), in Cambridge, Mass., stands a relatively humble memorial amidst architectural landmarks such as the Ray and Maria Stata Center by Frank Gehry, FAIA, and the Brain and Cognitive Sciences Complex by Charles Correa, HON. FAIA.

The curvilinear vault made from 190 tons of granite celebrates the life of Sean Collier, the MIT police officer killed on April 18, 2013, three days after the Boston Marathon bombing. After his death, mourners from the campus, the city, and beyond had created a makeshift memorial at this corner, where he was shot in his squad car.

MIT wanted to create a permanent memorial for the officer who, at 27, was not much older than many students. Provost Martin Schmidt and director of facilities operations and security John DiFava assembled a committee of students, faculty members, and police officers. A call for ideas in June 2013 had garnered more than 100 responses from the public, but holding a formal design competition seemed inappropriate. “We didn’t want this to be someone’s amazing personal win,” says Sara Ferry, a graduate student in nuclear science and engineering who was on the committee. Instead, the committee approached J. Meejin Yoon, AIA, head of MIT’s architecture department. “A lot of people felt that ... the designer [needed to] be someone who understands MIT,” Schmidt says.

Beyond architecture, Yoon, also a principal at Boston-based Höweler + Yoon Architecture, is known for mesmerizing light and sound installations, such as “White Noise/White Light,” an interactive field of fiber optic lights and sound that was displayed at MIT and the 2004 Olympics in Athens. Her work has what Ferry calls “that cool factor”—perfect to preserve the memory of a young, active man.

Initially, the project had no budget, site, or program—only the public’s ideas and some important themes: Collier’s love of hiking, his patriotism and service, and his appreciation for MIT culture. “I was anxious that the memorial could become a collection of many things,” Yoon says.

So she sought to capture several concepts into one form. She presented five sketches to the committee, the final of which drew from MIT’s motto, “Mens et Manus,” Latin for “mind and hand.” Five radial stone walls would form the fingers of an abstracted hand and meet at a central vault, the palm. The outstretched hand represented Collier’s spirit of helpfulness, while the space under the vault represented his absence. Curved apertures carved into each radial wall would

create passageways through the heart of the structure as well specific sightlines, including a window to where Collier’s police cruiser was parked. The solidness of the granite evoked the motto “Collier Strong,” a variation on “Boston Strong,” used by family members who ran the 2014 Boston Marathon in his memory.

The memorial’s form—a single structure assembled from many pieces—resonated with the committee. “We’re all pieces of a puzzle,” says MIT police officer Cheryl Vossmer. “We all fit into this community.”

### True Masonry

Each spoke of the memorial functions as a half-arch that buttresses the vault at the center. “I didn’t want it to be concrete clad in stone,” Yoon says. “I wanted this to work like a [masonry] vault, which means every stone is helping to support every other stone.”

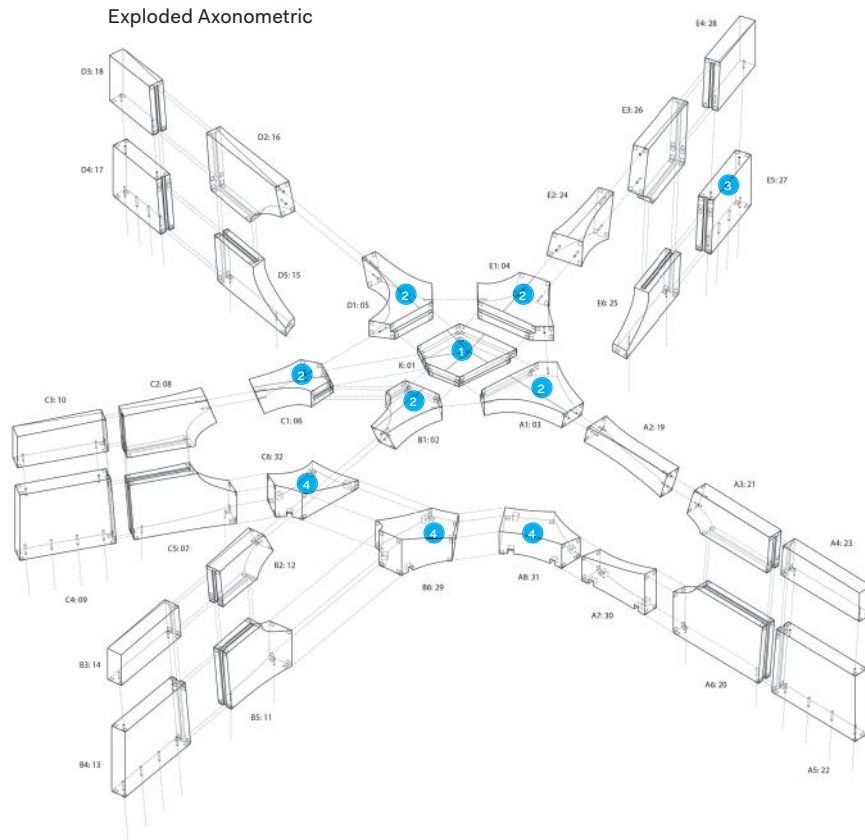
Though the design follows basic principles of masonry construction, its complexity and use of a historical building method required a specialized team of engineers, consultants, installers, and contractors. Yoon enlisted structural engineering firm Knippers Helbig, in New York, and masonry-vault expert John Ochsendorf, a building technology and civil engineering professor at MIT and a partner at the structural engineering firm Ochsendorf DeJong & Block (ODB), based in Cambridge.

The beauty of an arch lies in its ability to support loads in pure compression, in which masonry is incredibly strong. Yoon wanted the memorial’s vault ceiling to be as flat as possible, which would generate intense lateral forces, or thrust, through the half-arches and, ultimately, the support walls. Ochsendorf and his team developed software that allowed Yoon to map the forces in the stones and see the effect of changing the walls’ shapes and configurations on the structure’s overall stability. The program also helped determine how to parse the walls into individual masonry blocks.

Yoon and her team 3D-printed 1:50 models of 30 different iterations of the structure to explore design ideas from the software analysis; ODB also used a few models to test how the structure behaved. Together, the teams found a configuration in which the entire memorial would stand in compression, theoretically eliminating tensile forces in the structure and thus the need for masonry reinforcement.

However, when Knippers Helbig tested how the structure would perform under seismic loads, temperature shifts, and foundation settlement, they recommended placing steel pins between several granite blocks. “The shallow arch geometry is very sensitive to any changes at its supports,” says associate Tom Reiner. The pins would keep the stones in the





Previous spread: View from west,  
from Vassar Street

- 
1. Keystone
  2. Center stone
  3. Wall stone (typ.)
  4. Bottom stone

center of the vault aligned in case of movement and provide a ductile counterpoint to the brittle stone. “If the pins happen to become overloaded, they are designed to yield in a controlled manner before the stone fractures, allowing the structure to find a new equilibrium shape,” he says.

The addition of pins didn’t sit well with Ochsendorf. “My own desire for the project was that it would have the purity and simplicity of the stones only,” he says. In the end, however, his team agreed to use 58 stainless-steel pins, each 1.5 to 2 inches in diameter and up to a foot long, throughout the structure. Grout also fills the ¼-inch joint between blocks.

Yoon chose domestic granite to signify Collier’s patriotism. The designers along with some committee members hand-picked 32 raw blocks from a quarry in Virginia to correspond to each stone in the computer model. The blocks were shipped to the Quarra Stone Co., in Madison, Wis., and fabricated with a combination of manual labor and robotic saws to their specific profile within a 0.5-millimeter tolerance. Some blocks required seven days of nonstop sawing to carve. The blocks were then trucked in groups to Cambridge.

#### “Live Long”

The keystone is typically the final piece of an arch or vault construction. But for the Collier Memorial, the

12,000-pound, 7-foot-by-6.5-foot block of granite was positioned first, back in January. “We developed this concept of coming from the inside and working our way out,” Reiner says.

By mid-February, the notched, five-sided keystone was ringed by five center stones on the scaffold. In this project, the center stones were the hardest to place, with up to eight faces to match, rather than two or three for the wall stones.

The true test of the structure came on March 31, when the scaffold supporting the center stones was lowered, millimeter by millimeter, allowing it to stand on its own. Afterward, the stones at the memorial’s base were set in place, giving the space under the vault its ovoid form. At a lecture preceding the April 29 dedication ceremony, Rob Rogers, Collier’s stepbrother and the project manager for the general contractor, Suffolk Construction, said that among all his experiences in the past year, “setting that last stone and seeing everyone’s faces tops them all.”

At night, in-ground lights mapped to the positions of stars on that tragic night in April 2013 illuminate the structure. It harks back to Yoon’s love of lighting and adds a temporal quality to the design. While the project is both expressive and emotional, it is the attention to these details that makes the Collier Memorial a part of MIT.





The memorial's openings and passageways, created by suspending granite stones in compression





**Project Credits**

*Project:* Sean Collier Memorial,  
Cambridge, Mass.  
*Client:* Massachusetts Institute of Technology  
*Design Architect:* J. Meejin Yoon, AIA  
*Architect of Record:* Höweler + Yoon  
Architecture · Eric Höweler, AIA, Yoonhee Cho,  
Paul Cattaneo, Sungwoo Jang  
*Specialty Masonry Consultant:* Ochsendorf  
DeJong & Block  
*Structural Engineer:* Knippers Helbig  
Advanced Engineering

*Structural Engineer of Record:* RSE  
Associates  
*Landscape Architect:* Richard Burck  
Associates  
*Civil Engineer:* Nitsch Engineering  
*Geotechnical Engineer:* McPhail Associates  
*Electrical Engineer:* AHA Consulting Engineers  
*Typographic Consultant:* Francesca Bolognini  
*Construction Manager:* Suffolk Construction  
*Stone Fabricator:* Quarra Stone Co.  
*Granite Erector:* Phoenix Bay State  
Construction Co.

*Landscape Contractor:* ValleyCrest  
Landscape Development  
*Granite and Field Surveyor:* Feldman Land  
Surveyors  
*Geotechnical Construction:* Hayward Baker  
*Concrete Placement:* G&C Concrete  
Construction  
*Electrical Contractor:* Gaston Electrical  
*Construction Labor:* Liberty Construction  
*Site Development Contractor:* James W. Flett  
*Size:* 6,500 square feet  
*Cost:* Withheld



**Second Home  
London  
SelgasCano**

INTERVIEW BY KATIE GERFEN  
PHOTOS BY IWAN BAAN









**How did you get involved with Second Home?**

*José Selgas:* Second Home partners Rohan Silva and Sam Aldenton called because they wanted to work with us on a new idea for an incubator space in London. They believe in the power of architecture to give a new feeling to people working in the space, and wanted to give the sense that you could work or live there. The name is pretty clear about that. A lot of people spend more time at work than at their own homes, so the idea was to improve the space where you pass a lot of time in your life.

**It is a warm and inviting space, but also eclectic—it looks like it could be somebody's living room.**

The idea is that every piece in that space should be something you would also love to have in your home, something you can relate to. And it's not the same chair everywhere—you can change. You can say, 'I love that other chair, or I prefer *that* other chair,' so you can try different things and engage with different things around you, not only the people. That was part of the philosophy from the very beginning, and the idea was to bring that feeling to the whole building.

**Clearly color plays a big role.**

We have always worked with color. Our palette is very wide, and it was clear from the beginning that the clients wanted something very bright. It's important to have a big identity for the café, and to integrate the events, the floor, and the counter in one piece, and doing it with the orange was even stronger. The studio floors are painted yellow, with an epoxy paint, and we got all of the quantities of yellow paint in the whole of London. It's very rare for people to use that color. The painter arrived and he said, "I'm sorry, this is the last tin of yellow paint in London, so please don't waste it."

**Another predominant color is green—there seem to be more plants than people.**

There are 1,000 plants inside, and they are completely integrated into the shelving. With those planters, we wanted two things: one is that we wanted people living with plants, because it's clear that people love and need that feeling, and two, we wanted those plants to be like members of Second Home. They are alive, so you need to take care of them—there is this interaction with something alive in the architecture.

**How does that energy manifest in the common spaces?**

Members of Second Home can take advantage of events that are happening during the day and during the night. Some days they are doing yoga, some nights there are lectures or cinema, so it is a very alive

building, and a very alive concept. In the event space, there is a big table that sits almost 40 people, but you can lift it up with motors in the ceiling, and have events underneath. It is a mixed space where you can organize whatever you want. The problem is that it is too alive. These guys are a bit crazy. They are doing so many events that they are going to destroy the building in a year. But when you are there, it's fantastic the movement that you feel in every space.

**Another thing that is a bit crazy is the number of types of chairs in this space. How did you source them?**

We love design, we love furniture, we love vintage. We went around finding things here and there, in London, in fairs, and on the Internet—all around the world, really. Everything is vintage. Some were very expensive and some were very cheap. In the end, the average for the chairs was only £250, which is very good.

We are working on two more floors in the same building, but now we have connections with a lot of people around the world collecting vintage, so it will be very easy to find the new space. If the furniture for the first project took us 100 hours (well, more like 500 hours) to find, on the next it will take one-tenth of that. We also want to think about how to build new chairs, but still have vintage. We like to work on those ideas from project to project, taking the things we learn and try to improve things.

**You've clearly gotten a big bang out of a limited budget. Now that you're getting more international recognition—because of Second Home, and the Serpentine Pavilion in London this summer—are you changing your approach?**

Our vision has been clear since the beginning—we are not that young! We understand architecture, not just as drawings but as the relationship between construction, manufacturing, materials, and even with the people that are on site during the process. We learn a lot from those things. And clients are very happy that we are involved in the whole process. We try to do something very different and personal in every project.

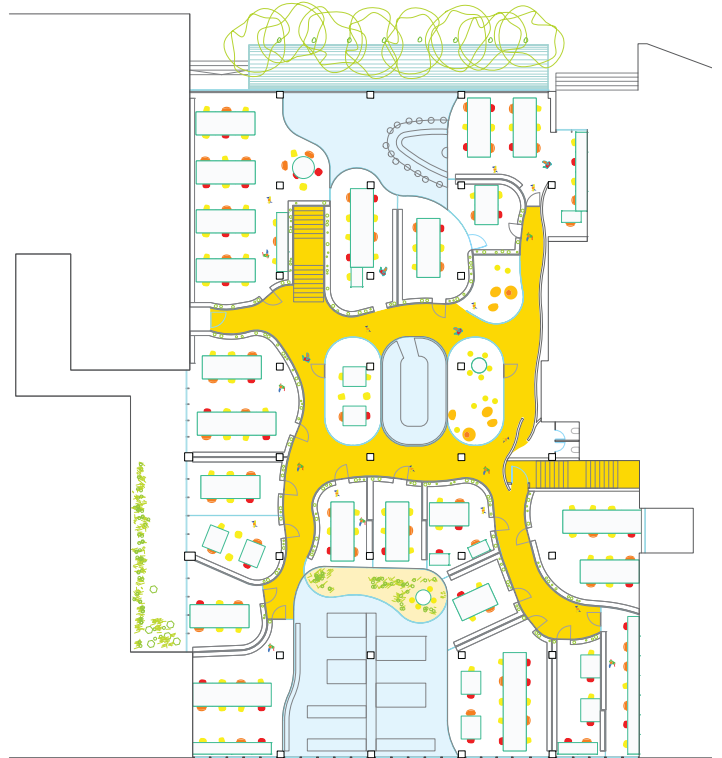
But the only way to do that is to be very much in the studio. We avoid teaching and doing lectures—we try to be absolutely focused on the projects. We have offices in Madrid, Los Angeles, and Stockholm, but the studios in L.A. and Stockholm only have one person each. In Madrid, we have about 15 people. Our studio space is very small, and we can't fit more people. It's fantastic because the space is telling us our limits, and when we built it, we wanted something small where we could listen and consult. We have fantastic people and that's the secret: Having good people and having fun in the things that we're doing.



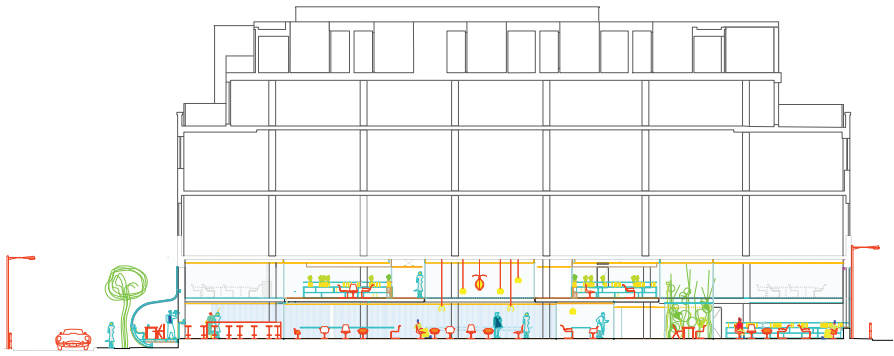
First-Floor Plan



Second-Floor Plan



Section A-A<sub>1</sub>



*Previous Spread:* Second Home has a membership-based business model. The small companies that use the facility can occupy acrylic-lined pods seating anywhere between five and 20 people. The interior accommodates 400 in total.



The bright orange color of the storefront café helps identify Second Home to passersby. Mirrored acrylic delineates the floor plate and reflects distorted views of the outdoors.











*This Page:* The double-height event space features a custom table that seats 40 for meetings (bottom) and can be hoisted out of the way for events (top). Yellow epoxy-painted floors provide a durable and multifunctional surface for yoga and other activities.

*Opposite Page:* SelgasCano was tasked with creating high visual impact on a low budget. Mineral-wool ceiling panels and vintage furniture contributed to the overall savings. A 2014 report from Arcadis places the indicative cost for major office renovations in London at between \$185 and \$210 per square foot. At roughly £1,300 per square meter (or \$184.50 per square foot), SelgasCano's renovation of the Second Home space falls at the bottom of that range.



**Project Credits**

*Project:* Second Home London Office, London

*Client:* Second Home

*Architect:* SelgasCano, Madrid · Jose Selgas, Lucia Cano (principals); Paolo Tringali, Víctor Jiménez, Bárbara Bardín, María Levene, Inés Olavarrieta (project team)

*Construction Management:* OD Group

*Structural Engineer:* Tibbalds Planning and Urban Design

*Cost Architect:* Jackson Coles

*Furniture Design:* SelgasCano/secondhand design furniture

*Size:* 2,400 square meters (25,833 square feet)

*Cost:* Withheld



**Nouveau Stade de Bordeaux  
Bordeaux, France  
Herzog & de Meuron**

TEXT BY SARA JOHNSON  
PHOTOS BY IWAN BAAN







*Previous Spread:* The Nouveau Stade de Bordeaux has 1,000 metal columns that support its inverted stepped roof. Herzog & de Meuron, inspired by the nearby treescape, arranged the columns so that they do not conform to a standard grid. At-grade entrances to offices and event spaces in the stadium's base flank the north and south (shown) façades.

*This Image:* In late May, the Football Club des Girondins de Bordeaux played its first home game at its new stadium. In the design for the 829,790-square-foot structure, the Basel, Switzerland-based architecture firm chose to forgo a conventional façade and construct an open-air form that suggests the function within.









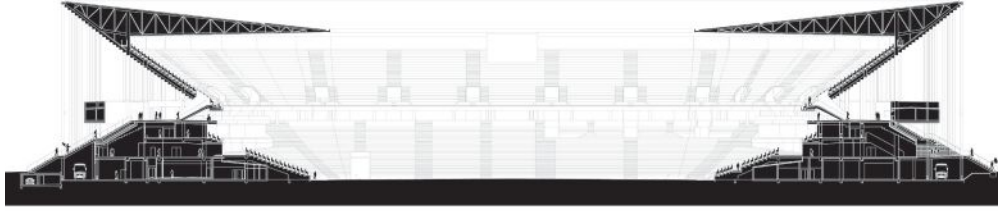


*Top:* The stadium has nearly 4 miles of stairs. On the east and west sides of the structure, monumental exterior stairs lead to VIP areas and administration in the stadium's base, as well as to the main concourse.

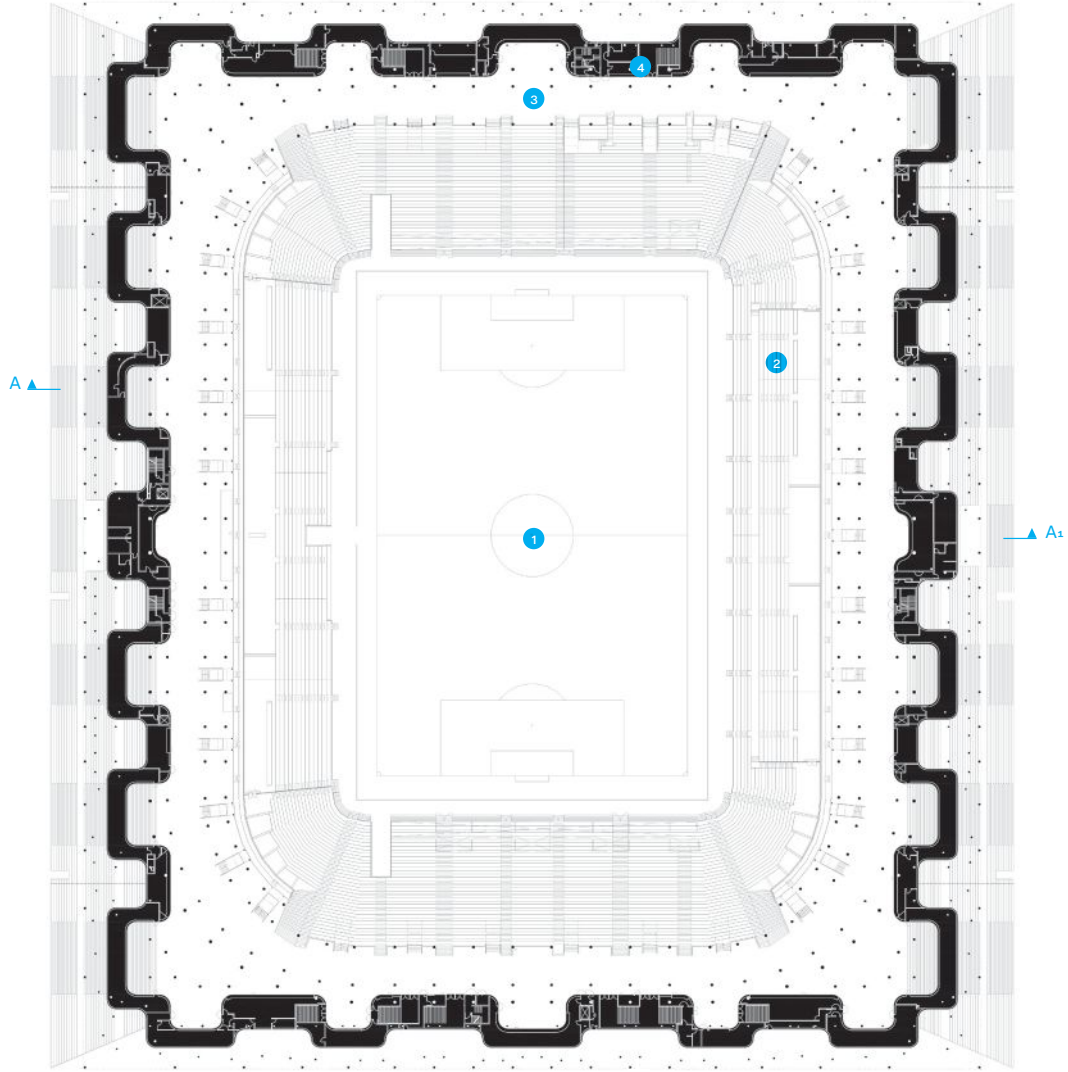
*Above:* The main concourse is on the fourth floor and offers visitors their first glimpse under the steel-clad upper deck and down to the field. Food venues, retail, and restrooms line its perimeter.



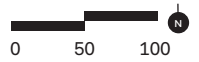
Section A-A1



Fourth-Floor Plan



- 1. Field
- 2. Seats
- 3. General admittance concourse
- 4. Kiosks



The approximately 42,000-seat stadium will host games in the Euro 2016 tournament. In addition to sports matches, it can be configured in three different arrangements for concerts. There are a 200-seat restaurant and 250-seat conference room on the ground level.

#### **Project Credits**

*Project:* Nouveau Stade de Bordeaux, Bordeaux, France  
*Client:* ADIM Sud-Ouest (Vinci Construction), Mérignac, France; CPI SOMIFA (Fayat Group), Floirac, France  
*Architect:* Herzog & de Meuron · Jacques Herzog, HON. FAIA, Pierre de Meuron, HON. FAIA (partners); Stefan Marbach (partner in charge); Tobias Winkelmann (associate, project director); Paul Vantieghem (associate, project manager); Thomas de Vries (associate, project manager)  
*Design Consultant:* Herzog & de Meuron France SARL  
*Executive Architect:* Groupe-6  
*Landscape Design:* Michel Desvigne Paysagiste

*Structural Engineer:* Cabinet Jaillet-Rouby; Structures Île-de-France  
*Civil Engineer:* Ingérop  
*M/E/P/HVAC Engineer:* Egis Bâtiments Sud-Ouest  
*Lighting Consultant:* Agence On  
*Acoustics:* IdB Acoustique  
*Signage:* Agence Franck Tallon  
*Maintenance:* Vinci Facilities  
*Quantity Surveyor:* Mazet & Associés  
*General Contractor:* Sogea Sud-Ouest Hydraulique; Castel & Fromaget; GTM Bâtiment Aquitaine (Contractor Group Representative); GTM Sud-Ouest TP GC; Razel-Bec; SEG Fayat  
*Size:* 829,790 square feet  
*Cost:* €183 million (\$204 million), total cost







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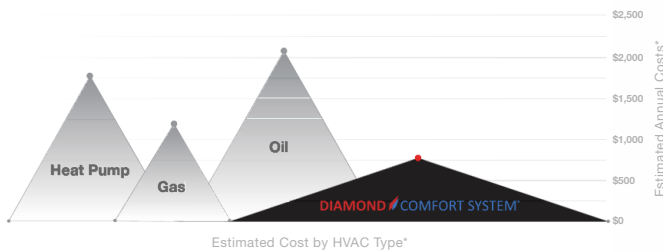
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\*Example based on a typical 2,000 square foot single-family detached home in NYC area. MXZ-4C36NAHZ system compared to 14 SEER/95AFUE unitary equipment. © 2015 Mitsubishi Electric, Inc.



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**Residential:  
Songpa Micro-Housing  
Seoul, South Korea  
SSD**

TEXT BY EDWARD KEEGAN, AIA  
PHOTOS BY SSD



In an increasingly urbanized world, the density achievable through micro-housing is a trending idea. New York- and Seoul, South Korea-based SSD principals Jinhee Park, AIA, and John Hong, AIA, explore the concept in a 14-unit structure that is an ethereal presence in a densely populated section of Seoul. “We think that it’s an arbitrary relationship that size and quality should be related,” Hong says. “We’re trying to play with that perception.”

The structure of SSD’s Songpa Micro-Housing is defined by a screen made of vertical, quarter-inch-thick stainless steel bars. “We wanted to maximize the floor area ratio and provide as many units as possible,” Park says. The mansard-like inflection in the overall form follows the required setbacks and the diagonal sun exposure line.

The ground level, primarily devoted to plaza space, includes four parking spaces as required by zoning. “None of the residents have cars,” Hong says. “That’s the funny thing about city regulations. They’re based on a metric that’s so general.”

A grade-level entry to an underground café is configured as a “micro-auditorium” where people can sit for performances. The subterranean shop also contains a public gallery with free coffee for residents—a bid to encourage a sense of community.

The residential units each comprise a mere 120 square feet—the smallest dimensions allowed by code—and are located on levels two through six. There are two configurations—rectangular and square—and all share common space in the center of the structure. “The perception of the space is expanded beyond your own living area,” Hong says. The shifted arrangement of the units within the overall frame creates varied interstitial spaces, some private, some shared. There are currently nine tenants, as several elected to combine units. The second floor has become a gallery that residents use as a shared living room.

Working with a limited budget, the firm kept the palette to a minimum: cement board exterior walls are wrapped in the stainless steel screens; interiors feature gypsum board walls, polished concrete floors in the common areas, and hardwood floors in the units. “We wanted to express how the building is used,” Hong says.

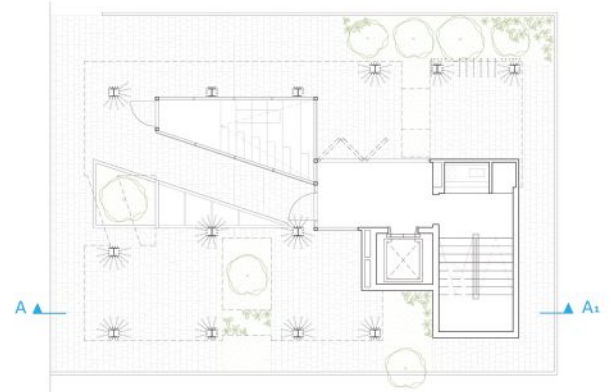
In exploring complex spatial relationships between extremely small living units, SSD has created a model that begs for further development. “The nuclear family is disappearing and becoming something else,” Hong says. “This housing responds to that and allows change to happen.” Songpa Micro-Housing’s blend of urban form and unit composition suggests other paths forward to develop flexible housing for new times: “We can create a more sustainable community,” Park says.



Third-Floor Plan



Ground-Floor Plan



Previous Page: Unit interior, with a closed Murphy bed at left







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*Architect of Record:* Dyne Architects

*Structural Engineer:* Mirae Structural Design Group

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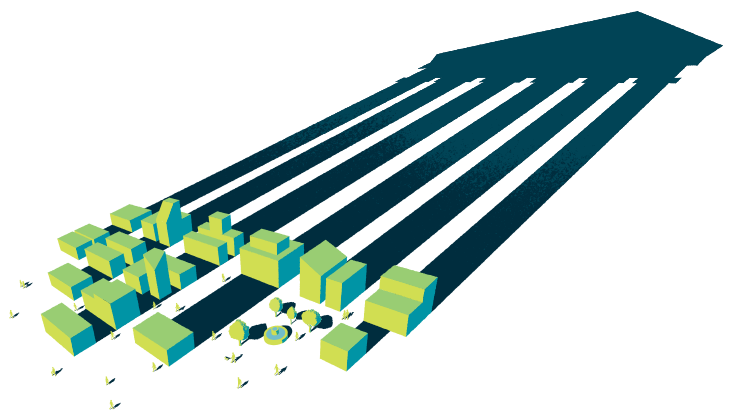
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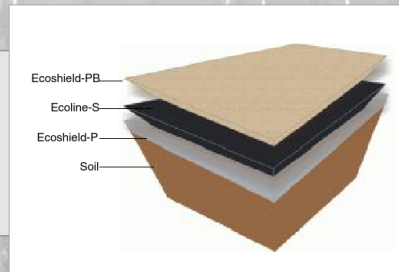
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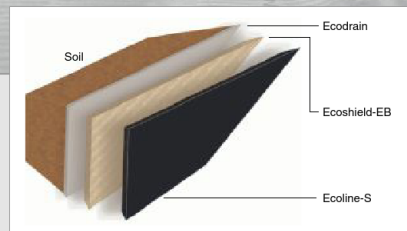
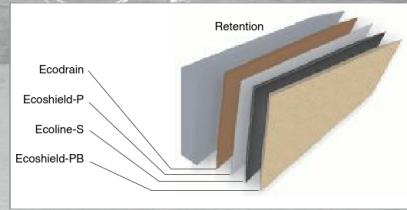
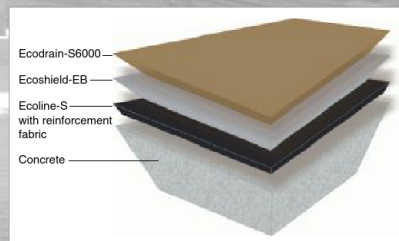
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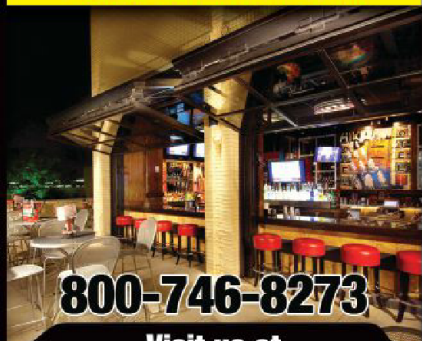
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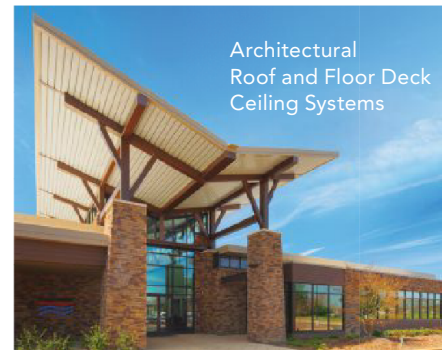


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# Editorial: Extending the Franchise

At the AIA Convention in Atlanta last month, the National Council of Architectural Registration Boards (NCARB) made a big announcement: It will no longer use the title “intern” to describe graduates of accredited architecture schools who are working toward a license. NCARB is also recommending that its independent member boards—those of the 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands—follow suit. Kudos to NCARB. The move is cause for celebration, in no small part because to anyone outside the field, the word “intern” suggests a summer job. Better still, eliminating the i-word is just one in a succession of essential reforms helping to humanize the path to licensure.

Interestingly, given the way the council framed its decision, the question of what term will replace “intern” remains unsettled. According to 2015 NCARB President Dale McKinney, FAIA, the organization is restricting its regulatory role “to the title ‘architect,’ which should only apply to licensed individuals. ... Any title held by those pursuing licensure does not need to be regulated.”

NCARB is not changing the parameters that determine who can—and can’t—describe themselves as an architect. You still need a license, which still requires the successful completion of a professional degree in architecture, thousands of hours of supervised work experience, and passing the Architect Registration Examination (ARE).

But there is a widespread fear that architecture has become too exclusive, that the barriers to entry are too high. I’ve heard distinguished practitioners passionately argue, as an antidote, that the title of “architect” should be divorced from licensure altogether and instead be granted to everyone who graduates from architecture school. Meanwhile, NCARB is testing a tantalizing scenario in which aspiring architects would take the ARE shortly after graduation, similar to the timing for aspiring lawyers taking the bar.

The ARE debuted in 1965 and the Intern Development Program in 1976; both have been revised over time. NCARB, AIA, and the other “collateral organizations” are wise in collaborating to update them once more. The stakeholders are numerous and, one would imagine, deeply invested. But I have faith that the process can yield meaningful outcomes without undue compromise. School curricula need not devolve into training programs because the ARE can occur sooner. Licensure—with its implications for health, safety, and liability—shouldn’t lose significance for being more readily obtainable.

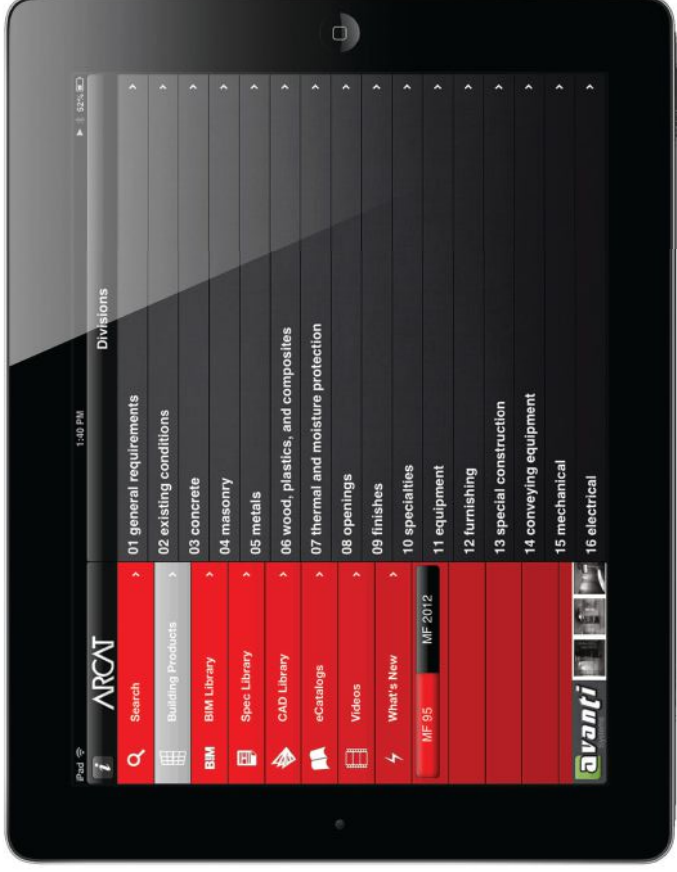
The reforms could result in an increased rate of licensure and more meaningful inclusion for groups that often and unnecessarily fall victim to attrition, such as women and emerging and alternative practitioners. And “I am an architect” suggests something more significant than “I studied architecture,” even when the person speaking doesn’t design buildings for a living. Indeed, every architecture school graduate who leaves the profession without first getting licensed represents a lost opportunity. Imagine all those erstwhile interns transformed into fully enfranchised ambassadors who represent the values of architecture in the broader world.







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