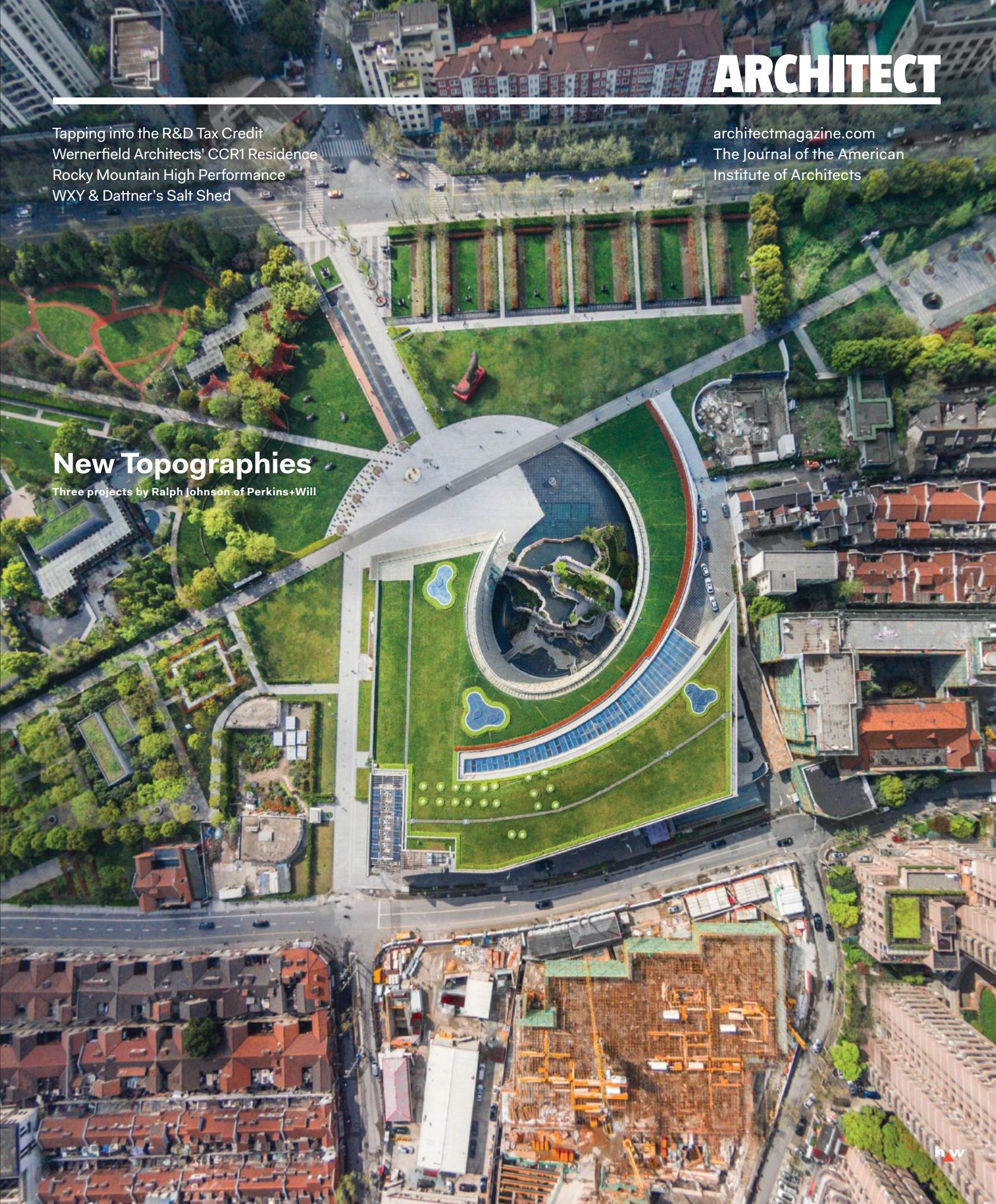


Tapping into the R&D Tax Credit  
Wernerfield Architects' CCR1 Residence  
Rocky Mountain High Performance  
WXY & Dattner's Salt Shed

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## New Topographies

Three projects by Ralph Johnson of Perkins+Will



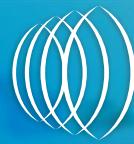


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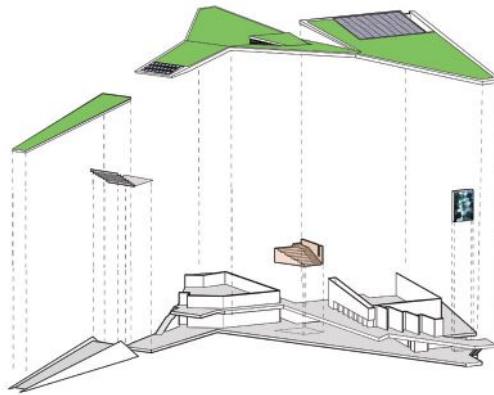
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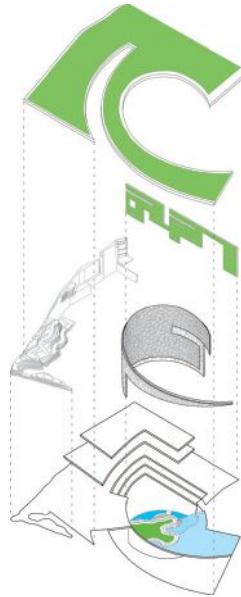
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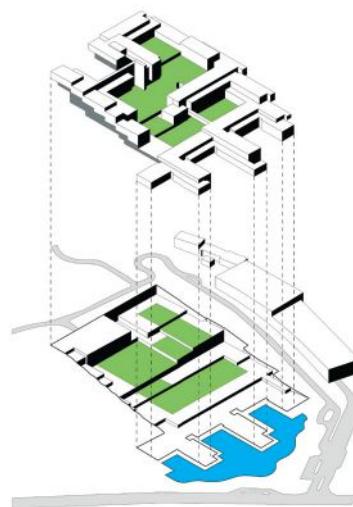
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Volume 105, number 3. March 2016. On the cover: Shanghai Natural History Museum; photo by James and Connor Steinkamp.

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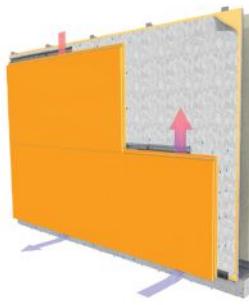
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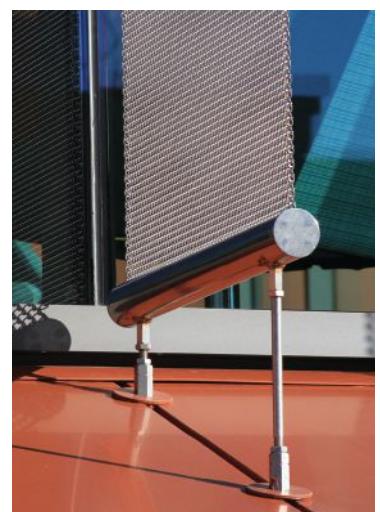


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**Editor-in-Chief**

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ncramer@hanleywood.com  
@NedCramer

**Managing Editor**

Greig O'Brien  
gobrien@hanleywood.com

**Art Director**

Robb Ogle  
rogle@hanleywood.com

**Design**

Editor  
Katie Gerfen  
kgerfen@hanleywood.com

**Features**

Senior Editor  
Eric Wills  
ewills@hanleywood.com

**Art**

Senior Graphic Designer  
Megan Mullsteff  
mmullsteff@hanleywood.com

**Associate Editor**

Deane Madsen, ASSOC. AIA  
dmadsen@hanleywood.com  
@deane\_madsen

**News and Social Media**

Content Producer  
Chelsea Blahut  
cblahut@hanleywood.com  
@chelseablahut

**Graphic Designer**

Ryan McKeever  
rmckeever@hanleywood.com

**Assistant Editor**

Sara Johnson  
sajohnson@hanleywood.com  
@SaraA\_Johnson

**Digital Content Intern**

Angie Cook

**Photo Editor Intern**

Alexander Cortez

**Technology and Practice**

Senior Editor  
Wanda Lau  
wlau@hanleywood.com  
@wandawlau

**Contributing Editors**

Aaron Betsky  
Blaine Brownell, AIA  
Thomas de Monchaux  
Elizabeth Evitts Dickinson  
John Morris Dixon, FAIA  
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Edward Keegan, AIA  
Ian Volner  
Mimi Zeiger

**Multimedia**  
Video Production Manager  
Lauren Honesty  
lhonesty@hanleywood.com

Videographer/Video Editor  
Jim Van Meer

**Design Group**

Group President  
Ron Spink  
rspink@hanleywood.com  
202.736.3431

Mid Atlantic, Southeast  
Susan Shepherd  
sshepherd@hanleywood.com  
404.386.1709

Digital Sales  
Christie Bardo  
cbardo@hanleywood.com  
202.736.3363

**Advertising**

Northeast, Great Lakes,

Georgia, Florida

Dan Colunio

dcolunio@hanleywood.com

202.736.3310

West

Suren Sagadevan

ssagadevan@hanleywood.com

310.863.9283

Lighting  
Cliff Smith

csmith@hanleywood.com

864.642.9598

**Midwest**

Michael Gilbert

mgilbert@hanleywood.com

773.824.2435

**Canada**

D. John Magner

jmagner@yorkmedia.net

416.598.0101, ext. 220

**Digital**

Product Director

Nickie Denick

China, Hong Kong, Taiwan

Judy Wang

judywang2000@vip.126.com

86.13810325171

Colleen T. Curran

ctcurran@yorkmedia.net

416.598.0101, ext. 230

**Production**

Production Manager

Paige Hirsch

New Account Setup

Jaeda Mohr

jmohr@hanleywood.com

202.736.3453

Canada

Ad Traffic Manager

Pam Fischer

New Account Setup

Erika Taylor

etaylor@hanleywood.com

202.380.3942

Vice President, Marketing

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Audience Marketing

Director

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**List Rentals**

Statistics

Jennifer Felling

j.felling@statistics.com

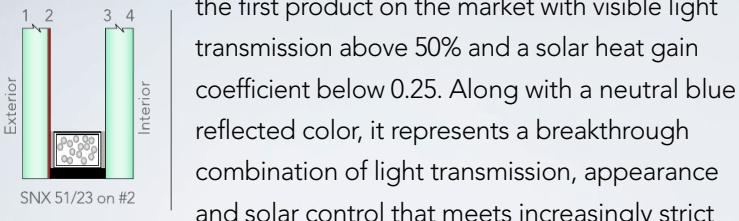
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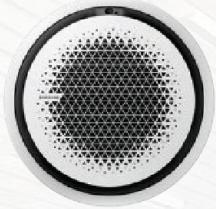
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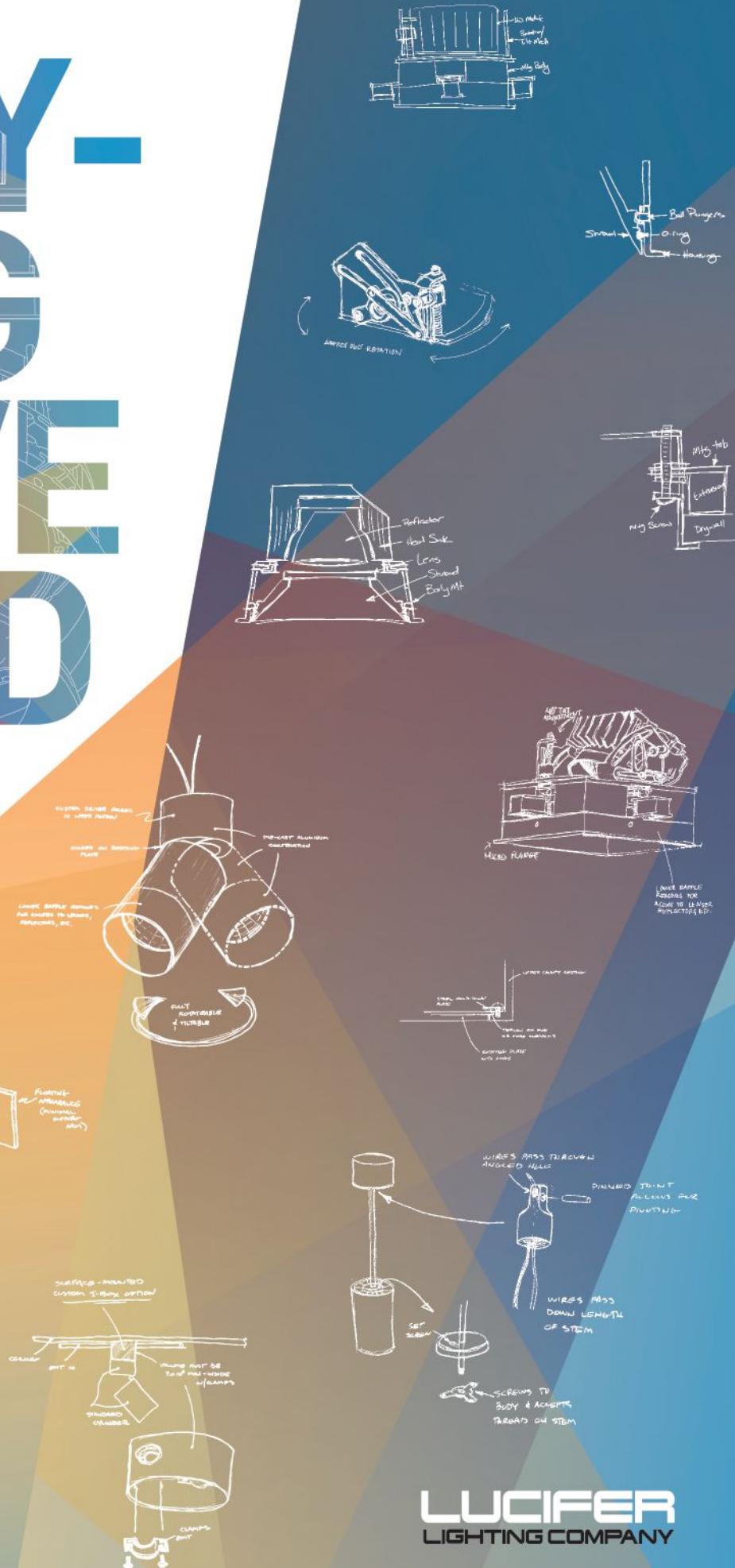
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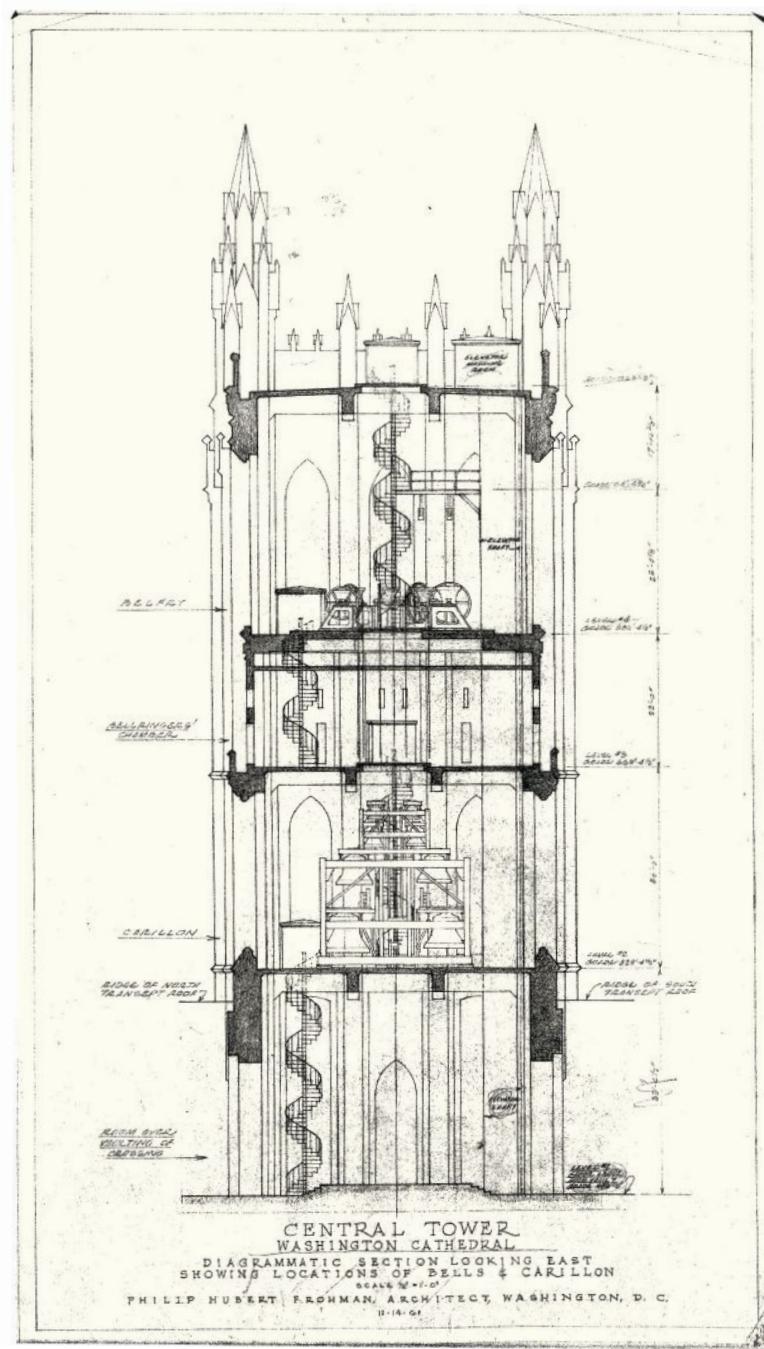
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Washington, D.C.'s National Cathedral is giving its design and construction archive of more than 32,000 architectural drawings, photographs, and microfiche to the National Building Museum, where it will be digitized, organized, and conserved. The move makes the cathedral's archive more accessible to the public, which is a big move since the material had been languishing in a secure, climate-controlled warehouse in Rockville, Md., since the Sept. 11 terrorist attacks, largely out of the reach of cathedral staff and researchers. —HALLIE BUSTA

> Read Hallie Busta's full story at [bit.ly/NationalCathedralArchives](http://bit.ly/NationalCathedralArchives).



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#### Floating to the Top

Each year, the Architectural League of New York presents its coveted Emerging Voices award to promising North American designers. This year's recipients are Alex Anmahian, AIA, and Nick Winton, AIA, of Anmahian Winton Architects; Omar Gandhi of Omar Gandhi Architect (whose *Float* in Halifax, Nova Scotia, is shown above); César Guerrero, Ana Cecilia Garza, Carlos Flores, and María Sevilla of S-AR; Frank Jacobus and Marc Manack, AIA, of SILO AR+D; Jon Lott, AIA, of PARA Project and Collective-LOK; E.B. Min, AIA, and Jeffrey Day, AIA, of Min | Day; Rozana Montiel of Estudio de Arquitectura; and Heather Roberge, of Murmur.

> Learn more about this year's Emerging Voices and find the schedule for the program's accompanying lecture series at [archleague.org](http://archleague.org).

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The Los Angeles Rams' future 70,000-seat stadium, designed by HKS Architects, is part of a 298-acre mixed-use redevelopment of the former Hollywood Park racetrack in Inglewood. Its enormous ETFE roof will cover not only the field and seats, but also an adjacent pedestrian plaza and a proposed 6,000-seat theater capable of hosting events like the Academy Awards. As HKS principal Mark Williams, AIA, says, "If you're spending billions of dollars, you want to have events 365 days a year no matter what the conditions are outside." The project will cost an estimated \$2.6 billion, and will be financed entirely with private funds. —BRIAN LIBBY

> For Brian Libby's full story, with more renderings of the future Inglewood stadium, visit [bit.ly/LARamsStadium](http://bit.ly/LARamsStadium).

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#### Continuously Printed Panton

That extruded-plastic icon of the 1960s, the Panton Chair, has recently received a lattice-like update for the 3D-printed present. A team from London's Bartlett School of Architecture—Hyunchul Kwon, Amreen Kaleel, and Xiaolin Li, known as CurVoxels—is developing robotics and processes for large-scale 3D printing. Using a custom-made printer that extrudes strings of plastic that dry in the air, they continuously printed their version of the Panton Chair using a system of voxelization, the breaking down of a digital schematic into volumetric pixels, or voxels. This cubist abstraction of curved form gives the final product its textured result.

> Watch a video about the process at [vimeo.com/140782149](https://vimeo.com/140782149).

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# Best Practices: Using the R&D Tax Credit

TEXT BY NATE BERG

The phrase "research and development" (R&D) may bring to mind white lab coats and Silicon Valley brainstorms, but new provisions in the federal tax code could turn workaday architecture firms into R&D hubs. The Research and Experimentation Tax Credit, also known as the R&D Tax Credit, offers up to \$10 billion in credits to businesses each tax year. In December, Congress extended and made permanent the 35-year-old credit while changing its scope to allow more small and midsize businesses to participate. It also shifted the credit's focus from considering only revolutionary developments within an industry to rewarding evolutionary activities such as investing time and resources in the development of new ideas that, while valuable, are not necessarily groundbreaking.

"It's less about new to the world," says Dean Zerbe, a Washington, D.C.-based national managing director for tax-services provider Alliantgroup. "It's got to be new to you, new to your work."

## Determining What Qualifies

A claim must meet four criteria to be eligible for the credit: the research is technological in nature and integrates one of the hard sciences, such as using computational design tools; it creates a new or improved level of functionality, reliability, or durability, like designing for better energy efficiency; it eliminates some uncertainty that was present at the start of the process, such as devising alternative design approaches

**"It's less about new to the world. It's got to be new to you, new to your work."**

—Dean Zerbe, national managing director, Alliantgroup

for high wind loads; and it involves experimentation, which could be as simple as trying out different designs to lower material costs for a project.

Modest research or new takes on familiar questions—such as increasing natural light in a hospital to improve patient healing—also count. "You don't have to be swinging for the fences," Zerbe says. "A single is great, too."

The credit does not apply to research that was completed after a product or design was commercially produced, the adaptation or duplication of an existing business component, or surveys and studies conducted to improve a firm's internal operations.

## Calculating Its Value

The latest changes to the credit allow startups that are less than five years old and have annual gross receipts of less than \$5 million to take up to \$250,000 in credits against their payroll taxes for up to five years. Companies making less than \$50 million in gross receipts for the three years preceding the tax year can now also qualify for the credit, unlike

before. Think of it as a dollar-for-dollar credit that can be collected on up to 6.5 percent of employee wages for time spent by designers, supervisors, and support staff on qualified activities, Zerbe says. Additionally, 65 percent of the amount paid to contractors, such as energy consultants, can be claimed as a qualified expense and used toward the credit.

## Taking Action

Claiming the credit is relatively simple, Zerbe says: Firms just need to show that they did the qualifying work. Given a typical architecture firm's time-tracking and project-documentation practices, the expenses should be easy to back up.

This kind of flexibility in reporting requirements can be a boon to firms that bid on a number of projects or do work that may never be implemented. Wayne, N.J.-based Tricarico Architecture and Design often bids on brand-identity and visual-merchandising projects. Its president Nicholas Tricarico, AIA, says that the roughly 115-person firm was able to use the credit for as-yet-unpaid work bidding on a project for a men's clothing retailer. "We probably spent a good 300 hours creating a look, plus some outside consulting work, and yet we don't even know today who they have awarded the work to, if they even did," he says. The R&D credit, however, enables the firm to take such risks. The resulting savings have been substantial, Tricarico adds, and he expects that his firm will earn back even more from the credit this year and next.

# I GALVANIZE BECAUSE



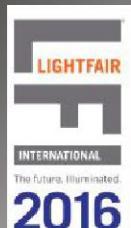
"Galvanizing helps the steel last much longer and helps protect the steel. If there is a nick or a cut in the paint or the galvanized steel, it repairs itself. We galvanized this structure so it will last at least 100 years. We use galvanizing on other projects where we have high humidity and we will absolutely galvanize any future greenhouse structures."

Paul Pryor,  
Director of Construction  
Administration,  
Moody Nolan Architects



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# Detail: Guastalla School Portal Frame Section

TEXT BY TIMOTHY A. SCHULER

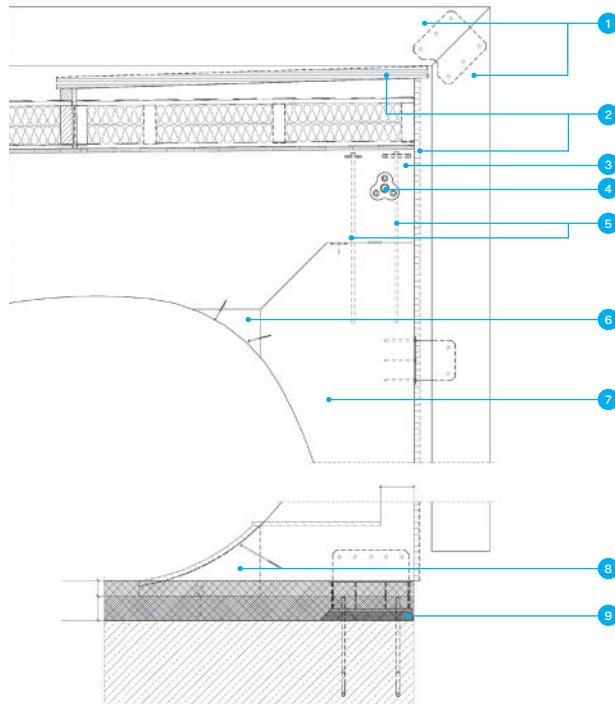
In Carlo Collodi's *Pinocchio*, the puppet reunites with his father in the belly of a giant whale, a metaphor for a mother's womb. The scene inspired Bologna, Italy-based Mario Cucinella Architects (MCA) to craft a continuous volume of play spaces defined by cutouts made in a series of 50 wall planes, or ribs, for a nursery school in Guastalla, a town in northern Italy.

The rectangular larch-glulam portal frames, capped with matching glulam roof and wall fins on the outside, define the 230-foot-long southern half of the 15,000-square-foot facility. Inside, the whimsical cutouts appear to continue into the oak flooring, creating climbing and play surfaces. MCA founder Mario Cucinella says the emphasis of wood offers students myriad tactile and sensory experiences, as well as a connection to a nearby forest.

In elevation, the frames appear to be carved from a single block of wood when they actually comprise three primary pieces—a 15-foot-tall exterior column, an 11-foot-tall interior column, and a 59-foot-long beam. The designers used Grasshopper and Rhino to create each unique cutout shape while maintaining the frames' structural integrity.

The school was originally housed in two facilities, both of which were damaged by earthquakes in May 2012. During the rebuilding effort, classes were held in the local city hall. "[The nursery] was built with some urgency," Cucinella says. Construction took just eight months and was completed in 2015.

Innovative Detail is a series on material-assembly solutions proudly supported by reThink Wood.



1. Exterior glulam roof and wall fins
2. Insulated glass panel and curtainwall
3. 16cm larch-glulam beam, 59' long
4. Ø16mm steel rod
5. Embedded threaded rod and knife plate
6. 16cm larch-glulam wedge
7. 16cm larch-glulam column, 15' tall
8. 16cm larch-glulam wedge
9. Metal shoe isolation pad

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The jury will consider new technologies as well as novel uses of existing technologies. Entries will be judged for their documented innovation in fabrication, installation, user engagement, and performance as well as their potential to advance the aesthetic, environmental, and social value of architecture.

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The winning entries will appear in the July 2016 issue of ARCHITECT, both in print and online.

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## WOOD: WARM, NATURAL RESPONSE TO COMMERCIAL OFFICE SPACE

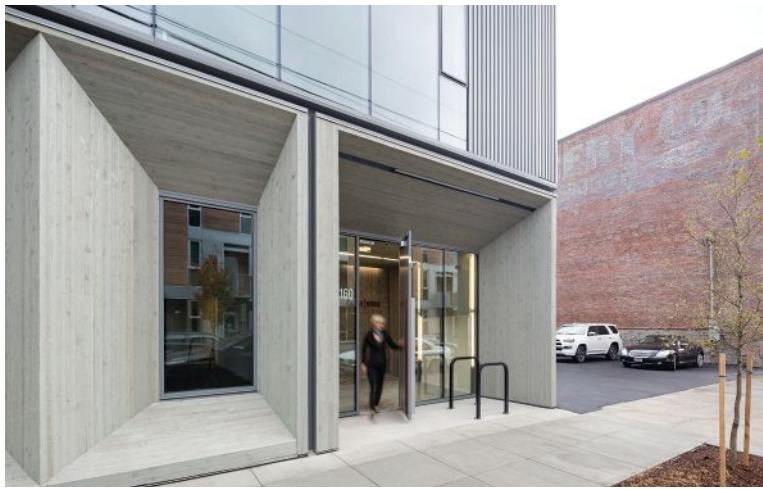
To fully appreciate 160 NE 6th Avenue in Portland, Oregon, stroll by it and look up into the interior. Revealed beyond the sleek glass-and-aluminum curtain wall is a 24,447 square foot mid-rise office building composed of wood.

The open floor plate allows commercial tenants and their interior design planners the option of taking full advantage of daylighting for energy conservation. Contrast this daylight-friendly transparency with the heavy masonry exterior walls and small apertures often associated in the glulam beam construction of adaptive reuse structures.

The \$3 million class A office center, called Framework and delivered in September 2015, takes full advantage of advances in modern mass timber products to gently disrupt its neighbors in Portland's revitalized Central Eastside, a century-old warehouse district rejuvenated by adaptive reuse.

### Links to Now and Then

"In collaboration with the client, we wanted to create a commercial workspace building that was a direct extension of the historic timber frame industrial structures that dot east Portland," explains project architects, Carrie Strickland, AIA, and William Neburka, AIA, principals and co-founders of Works Partnership Architecture, LLP, an award-winning Portland-based design studio.



**Framework delivered on budget and is compliant to all code, including fire.** Dense glulam beam (GLB) offers excellent fire resistive characteristics, and maintains significant and lengthy structural integrity in a fire.



To mitigate solar gain, the main glazing appears on the north and west facades. Note the operational windows, allowing occupants to take advantage of Portland's mild climate and reducing energy expense on conditioned air.

The concrete podium base houses parking, retail, and the lobby. The heavy base pays homage to the thick masonry walls of neighboring buildings. That podium is topped by four stories of glulam construction. The all-wood interior keeps faith with the district's heritage of timber framework, though a masonry cladding has given way to a sophisticated glass-and-aluminum curtain wall system. The designers liken the blended aesthetic to a ship in the bottle.

#### Celebration of Wood

"The upper four floors are a mass timber frame with glulam beams and columns with a 3-inch tongue and groove wood decking, laid diagonal," explain the designers. "Plywood shear walls constitute the lateral system and are the only fixed walls in the space." Transparent. Open. Inviting. Framework is a contemporary salute to Oregon's timberland tradition.

"The project celebrates wood," Strickland and Neburka observe. "The design exposes 80 percent of the wood used. There is a warmth to wood that can't be replicated in

other materials. Wood has the ability to create a more complex and intimate environment even in an expansive, open space." Wood also represents "an inherently sustainable strategy of renewable and regional materials."

#### A Tale Well Told

In addition to the timber framing and infill materials, the staircases are fabricated with next-generation lumber, including laminated strand lumber and structural plywood. The framework's glulam beams were presealed to mitigate the effects of the City of Roses' notoriously moist climate (operational windows encourage occupants to open and enjoy fresh air, another bow to nature).

"There is an intuitive quality about the use of wood and how it's assembled that people can follow from the exterior to the interior."

If buildings tell a story, the Framework story is a happy one: work is well underway in the city demonstrating how... "new and more complex laminated timber panels can meet the more stringent building requirements of taller, larger structures."

**Owner:** Urban Development Partners

**Architect:** Works Partnership Architecture

**Civil Engineer:** Don Cushing Assoc. Inc.

**General Contractor:** Yorke & Curtis

**Structural Engineer:** TM Rippey Consulting Engineers

**Geotech:** Geo Pacific Engineering, Inc.

**Photographer:** Joshua Jay Elliott

**Location:** 160 NE 6th Avenue, Portland, Ore.

#### Awards

2016 Commercial Design Award  
US WoodWorks Wood Design Awards

Top 5 Building of the Year 2016 / ArchDaily,  
Category: Office

# Next Progressives: Besler & Sons

TEXT BY DANIELLE RAGO

PORTRAIT BY ANDY J. SCOTT

The conventional line between architecture and construction gets blurry in the work of Los Angeles-based Besler & Sons. Although Erin and Ian Besler officially co-founded the firm in 2014, the couple has been working together for years. "It's less of a collaboration and more that we work on each other's projects equally," Erin says. Ian agrees: "At times it's discrete,



Erin and Ian Besler

and at times it's really passing [a project] back and forth."

The practice—whose name stems from Ian's graduate program director's frequent greeting: "How's 'Besler & Sons?'"—has accumulated several accolades in its short history. In 2015 alone, it won the Architectural League Prize and was a finalist for the MoMA PS1 Young Architects Program. The firm was also invited to participate in both the inaugural Chicago Architecture Biennial (CAB) and the Shenzhen

and Hong Kong Bi-City Biennial of Architecture/Urbanism (UABB), where it nabbed the UABB Bronze Dragon.

Besler & Sons approaches each project with the goal of sparking discourse among different types of people, perhaps because their own backgrounds vary so—Erin is a trained architect with a B.Arch. from Yale University and an M.Arch. from SCI-Arc; Ian is a graphic designer and arts writer with a B.S. in journalism from the University of Illinois at Chicago and an M.F.A. from the ArtCenter College of Design, in Pasadena, Calif. Not surprisingly, then, their design processes don't always align. "We spend a lot of time talking about process and trying to critique it," Ian says. "We think about the procurement of materials as well as the installation, exhibition, and de-installation periods," Erin adds.

The result is projects that are driven by investigations into fabrication and made from off-the-shelf building materials: drywall, molding, steel studs, 2x4s, and even gutters. "We rely on the standardization of big-box retail store inventories," Ian says. For example, as part of their Architectural League Prize exhibition, *Authenticity*, the designers refitted rain-gutter components to form a network that bent around existing lighting within the gallery space.

*The Entire Situation*, an installation at Los Angeles' MAK Center for Art and Architecture, featured full-scale mock-ups of interior walls with unexpected treatments like baseboards that appear

to fold over themselves. The Beslers continued this research in their CAB project by developing the software Studfindr in collaboration with Satoru Sugihara, founder of Los Angeles-based firm ATLV. The program generates and catalogs 3D digital models, complete with time-and-material estimates, based on input from visitors to the installation.

For their MoMA PS1 proposal, *Roof Deck*, the pair focuses on the roof, both for its architectural properties and for its history as a social space, to provide the requisite shade, seating, and water in the museum courtyard. Inspired by conversations with theorist Sylvia Lavin—who directs the Ph.D. program at the University of California, Los Angeles' Department of Architecture and Urban Design, where Erin also teaches—the Beslers proposed replicating MoMA PS1's roofing framework at full-scale above the courtyard, attaching gutters to divert runoff into a water retention system. Any roof portions that couldn't fit would be inverted and used as stages. The concept cleverly integrates a form of reuse and recycling by alluding to MoMA PS1's 1976 inaugural exhibition, *Rooms*, where artists used the museum building itself as a medium.

By using standard construction materials in nonstandard applications, Erin says that Besler & Sons continually pushes the line between design and making while "thinking about the life span of a project" and exploring how to assemble meaningful designs within practical constraints.



When the doors swing open at the Winspear Opera House in Dallas, ticketholders expect a dramatic performance — and superb quality. Architects designing the 2,300-seat facility demanded nothing less. That's why they commissioned VT Industries to create the theatre's Architectural Wood Doors. Custom-stained VT doors perfectly complement the vivid red tones of the Winspear's luxurious interior. Acoustical doors from VT keep noise out — and sound in — so every note resonates with clarity. And 90-minute fire-rated VT doors offer superior protection night after night. That's a well-rounded production only VT can deliver.

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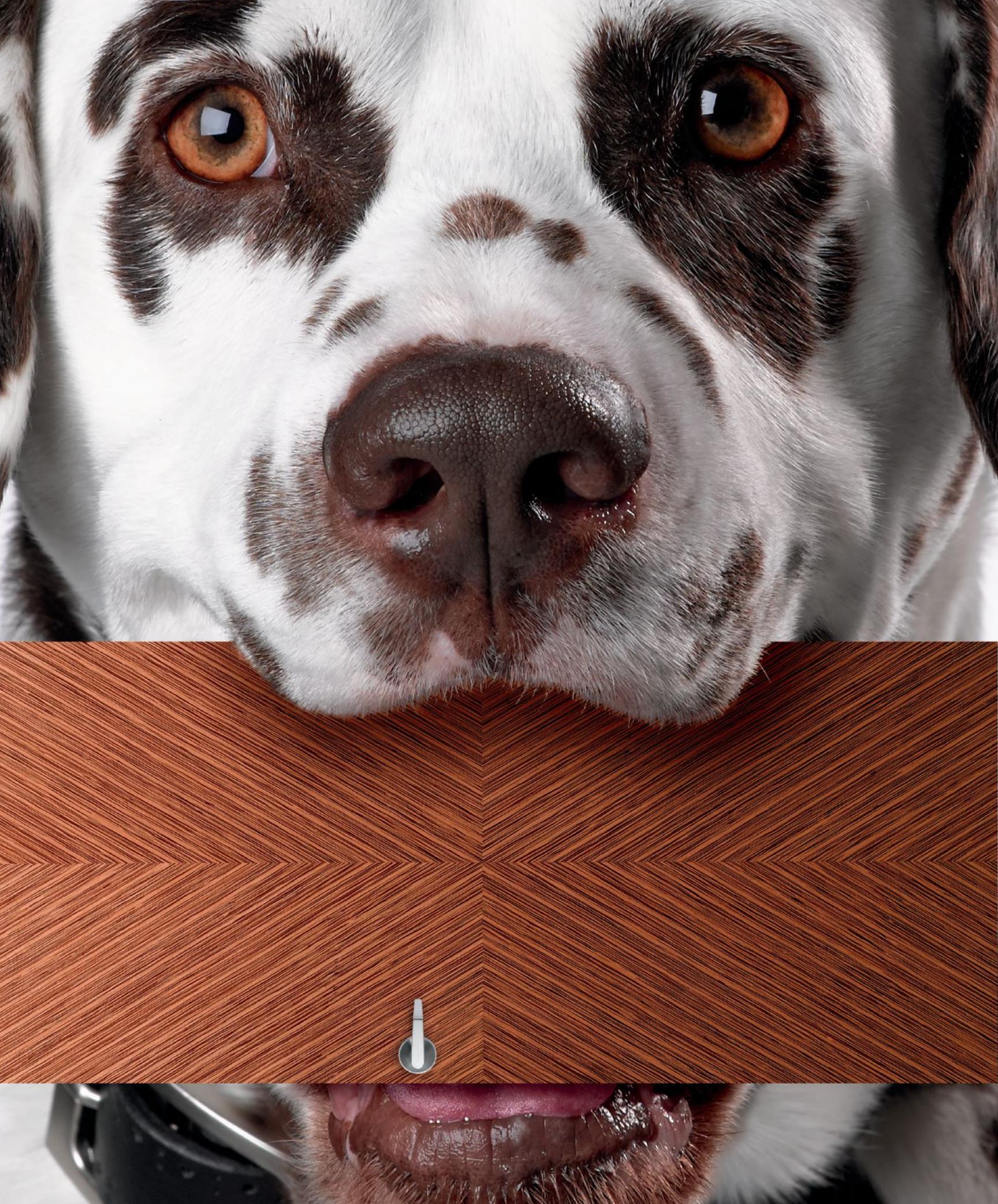
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**Next Progressives:  
Besler & Sons**



COURTESY BESLER & SONS



**1–2.** Besler & Sons' proposal for the 2015 MoMA PS1 Young Architects Program replicated the museum's existing roof framing to create a sunshading system for the PS1 courtyard. **3–6.** *The Entire Situation*, an installation at the MAK Center for Art and Architecture in Los Angeles, investigated material applications in wall assemblies. **7.** For its 2015 Architectural League Prize installation, the Beslers developed a network of gutters that bent around existing gallery track lighting to showcase the potential of commonly available building materials. **8.** To continue the research from the MAK Center exhibition, Besler & Sons developed Studfindr in collaboration with Satoru Sugihara for the Chicago Architecture Biennial. Digital output from the program includes rendered studwall constructions as well as material and cost breakdowns.

# Products:

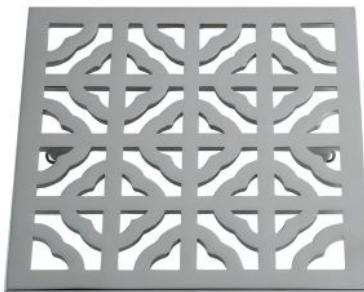
## Bath

TEXT BY SELIN ASHABOGLU



### Dressage Free-Standing Vanity, Graff

A sawhorse base in solid walnut adds artisanal appeal to this compact vanity, which can be specified with an array of functional modules, including a washbasin, shelf, tray, towel hook, rotatable mirror, and soft-close drawers. Offered with DuPont Corian surfacing. [graff-faucets.com](http://graff-faucets.com)



### Petal Decorative Drain, Rohl

Geometric patterning on these flush-mounted, solid brass decorative drain covers adds a touch of detail to shower floors. Petal (shown) is one of four new, 5-inch-square designs. Finishes include polished chrome and nickel, brass, and bronze. [rohlhome.com](http://rohlhome.com)



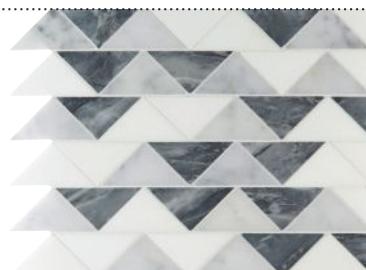
### Litze, Brizo

Bauhaus-inspired forms and accents like teak wood and textural knurling elevate this collection of bath fixtures and fittings whose name, Litze ("braid" in German), speaks to its subtle details. Available in chrome, nickel, and gold finishes. [brizo.com](http://brizo.com)



### Cerclo, Inbani

The edges of Cerclo, one of three new Corian sinks from the Spanish bath manufacturer, measure just 12mm thick. The oval, rectangular, and circular (shown) units can be top- or undermounted and specified with a matching valve. Finished in matte white. [inbani.com](http://inbani.com)



### Liaison, Ann Sacks

Enliven bath and shower walls with these striking geometric marble mosaics. By Los Angeles-based designer Kelly Wearstler for Ann Sacks, Liaison is offered in eight semi-custom shapes, sizes, and patterns (Canon Small in charcoal blend, shown). [annsacks.com](http://annsacks.com)



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# AIA Architect

## AIA Voices



PHOTOGRAPHY: PORTER GIFFORD

### Commitment Coach

#### The road to 2030 is shorter than you think.

Andrea Love, AIA, is the director of building science at Boston-based Payette and chair of the AIA 2030 Working Group. Her work is grounded in the philosophy that architecture is both an art and a science, and she combines her design vision with a mission to push the performance of buildings and minimize their impact on the environment. Often she integrates performance-modeling tools into Payette's design process to inform and push the limit of designs.

As told to Caitlin Reagan

The 2030 Commitment is about changing the whole practice. The way I like to think about it is how it differs from certification programs, which are about rewarding and highlighting projects. The 2030 Commitment is about changing our entire portfolio. It's about looking at everything we have designed and touched as architects, as well as the environmental impact we've had. In essence, it's about nothing short of improving the performance of our practices and firms.

Last year, we stepped up the target to a 70 percent reduction. This year will be the first year that people are reporting on that 70 percent reduction target goal—if they met that goal and, if not, how close they got. It's pretty rare for a firm to reach 70 percent reduction, but we have to start somewhere. Maybe we get there by 2035, or 2040, but we're never going to get there if we don't start tracking and understanding our buildings' performance.

At Payette, the 2030 Commitment has made a huge impact on the energy literacy of our staff, becoming part of our company lexicon. I can go to any one of the partners

now and ask them what the EUI [energy use intensity] of the project is. They may not know the answer off the top of their heads, but they know where to get it—and they know whether it's a good number or bad number. What we're going to do over the next five to 10 years is continue to build that literacy—or what I like to call "energy intuition."

The last two years, [the 2030 Working Group] really focused on getting the Design Data Exchange [DDx] reporting tool up online and working so that it could become part of the design process, instead of a reporting exercise that you do at the end of the year. This year, we're focusing on creating resources and processes that will make it easier for firms to participate. We have a number of firms that have signed the 2030 Commitment, but haven't reported. Only a third of those that have signed have reported each year. We're also looking to create a mentorship program that functions as a peer-to-peer network for case studies on how firms are meeting the 2030 Commitment, success stories, and opportunities to improve. **AIA**



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# AIA Now

By Steve Cimino  
Art Direction by Jelena Schulz

## The Elements of Energy

Every year, the AIA's Committee on the Environment (COTE) awards 10 projects that exemplify both sustainable and beautiful design. Each of the following recipients from 2015's COTE Top Ten have either transformed or taken advantage of elemental aspects of the natural world to complement and achieve their energy efficiency goals.

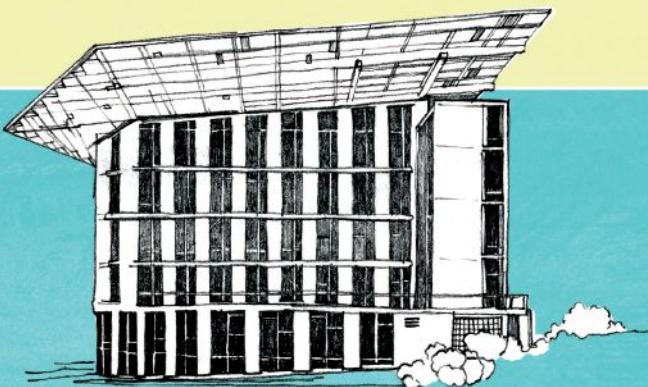


**AIR** New Orleans BioInnovation Center by Eskew+Dumez+Ripple and NBBJ: The differing standards of various tenants in this lab require the air to be flushed up to 10 changes per hour. Operable windows are also largely not allowed, due to specific conditions for certain experiments. But by using the returning air from offices as a diluent for the air supply of the labs, conditioned comfort can be shared with the office areas at a very reasonable energy cost. Each lab is also able to independently control its own Independent airflow and temperature controls also allow researchers to tailor their ventilation levels.

**LAND** Federal Center South Building 1202 by ZGF Architects: Located on the banks of the Duwamish Waterway in Seattle, this workspace for the U.S. Army Corps of Engineers converted its 4.6-acre site from 100 percent impervious to 50 percent pervious landscape. The ghosts of industry are still present in the nearby Albert Kahn-designed former Ford Motor Co. Assembly Plant and a cement plant, but the Environmental Protection Agency is cleaning up the surrounding area in an effort to increase use of the new site and bike trails.

**LIGHT** Hughes Warehouse Adaptive Reuse by Overland Partners: Located in San Antonio, the original building was largely shielded behind a double-wythe brick wall. Opening it up to the outside world was a necessity. The architects added windows along the east and west façades and a glass curtainwall to a newly inserted courtyard. The once-ensconced building is now awash with natural light: Views to the outside are available in almost 99 percent of the floor area and 60 percent of the office floor area is within 15 feet of an operable window.

**WATER** The Bullitt Center by the Miller Hull Partnership: Designed to replicate the water recycling capabilities of a Douglas fir forest, this Seattle project aims to use rainwater as the supply for 100 percent of its water needs. All of the water collected from the roof is treated and stored in a 56,000-gallon cistern as nonpotable water for the building's operations. (Permits are out now to transform it into potable water). Even the waste is valued: Foam flush toilets and urinals deliver what is known as "blackwater" to composing units in the basement, where it is used to fertilize the nearby soil.



## AIAFeature

# After COP21: Where We Go from Here

**Will the Paris climate agreement change how architects approach their work?**

By Kim O'Connell



ILLUSTRATIONS: MICHAEL KIRKHAM

By many accounts, the 2015 United Nations Climate Change Conference in Paris last fall, better known as COP21, had something of a carnival atmosphere—with 196 countries represented, multiple venues, activists dressed like polar bears and penguins, and celebrities like Leonardo DiCaprio and Sean Penn on hand (as well as nearly 300 security checkpoints in the wake of the then-recent terror attacks). Yet the conference produced a serious and ambitious outcome: an agreement to limit global warming to “well below” 2 C (and below 1.5 C, if possible) compared to preindustrial levels, which would require net-zero greenhouse gas emissions by the second half of this century.

Following such a declaration, the collective question for policymakers, environmental activists, and the building industry is: Now what? The agreement is not binding until 55 member nations who produce more than 55 percent of the world’s greenhouse gases have ratified it—including the United States, where climate change remains a divisive political issue (and potentially a nonstarter, depending in part on the outcome of this year’s presidential election). In light of the agreement and its attendant uncertainties, what can architects do to help achieve these goals?

For many, the answer is to keep doing what they’re already doing. The industry has known for years that residential and commercial buildings account for nearly 40 percent of total U.S. energy consumption and carbon dioxide emissions. (And, in recognition, the COP21 meeting included the

first-ever Buildings Day, with international building experts and a sustainable design expo.) Through programs such as LEED and the AIA 2030 Commitment—the Institute’s member response to the Architecture 2030 Challenge, which aims for carbon neutrality within 15 years—architects have helped to change the way buildings are conceived and built. According to 2016 AIA President Russell Davidson, FAIA, higher-performance buildings have resulted in about \$560 billion in energy savings in the U.S. since 2005.

Architects are ahead of the game in many ways, says Bertrand Coldefy, INTL ASSOC. AIA, 2015 President of AIA Europe. “COP21 was a meeting of 196 countries’ representatives with the same issue: Get a better quality of life for the world, and energy saving,” he says. “For this purpose, the meeting had the very positive outcome to galvanize a large public. Unfortunately, the

agreement signed at COP21 was quite poor and hard to finalize. Architects and engineers in different parts of the world have been working strongly for many years on this, and their works are more practical and advanced.”

#### Is Architecture as a Whole Ready?

Despite this, some are saying there is a leadership gap among architects when it comes to climate change and energy. The issue—lowering emissions and achieving carbon neutrality—is well-understood, but not enough people are acting on it, according to Lance Hosey, FAIA, chief sustainability officer for Perkins Eastman Architects and a member of the AIA Committee on the Environment Advisory Group and the AIA Energy Leadership Group.

“The 2030 Commitment is an urgent and reasonable goal for the next 15 years—urgent

# AIA Feature

CONTINUED

because buildings account for nearly half of all energy and emissions, and reasonable because experience and evidence show that net zero is achievable without additional costs,” Hosey says. “Eventually, we can shoot for more—by making buildings produce more energy than they need and turning them into carbon sinks. The obstacles have less to do with the industry’s goals, as represented by the 2030 Commitment, than they do with architects not showing enough leadership, frankly.”

Hosey points to the numbers: Of the 87,000 AIA members and tens of thousands of firms, he says, only 366 firms have signed up for the 2030 Commitment. “No matter how you do the math, a tiny fraction of the profession has made a commitment,” he says. “Of the firms who have, fewer than half actually report their numbers. And of those who do report, the average energy reduction has been stuck at about 35 percent for the past five years.”

The profession’s “starchitects” have a role to play as well. Hosey has been unafraid to call out those celebrated designers, including AIA Fellows Frank Gehry, FAIA, and Peter Eisenman, FAIA, who have shown little interest in sustainability or dismissed it outright. (Eisenman once said sustainability had “nothing to do with architecture.”)

“The industry needs a wake-up call,” Hosey says. “My approach has been to try to educate and inspire more architects about how better performance can lead to better design, and vice versa.” Hosey has written a book, *The Shape of Green* (Island Press, 2012), to this effect.

## Making Sense of Making Cents

Getting the money to support these goals is also necessary. AIA Europe’s Coldefy is calling on the profession to apply COP21’s spirit of international coalition-building to more targeted international discussions with engineers, contractors, and investors. “There is a lot of difference between various countries. In Europe, the Nordic countries and Germany have been, for a long time, more ahead on environmental issues and energy savings,” he says. The “AIA and its international organization could be a leader to organize such seminars with the International Union of Architects.”

Rives Taylor, FAIA, the regional sustainability leader for Gensler who attended COP21 events in Paris, agrees. “We have an awful lot of tools now, through energy modeling and other means,” he says. “Now

let’s do ‘business as usual’ on steroids. Let’s up our game through discussions and partnerships with manufacturers, developers, financiers... The built environment should be and must be a huge focus, and we know that already; but our leaders and NGOs are coming around. The role of the architect as an educator will be very important.”

The main challenge is to lower construction costs associated with energy-efficient design. “Our private or public clients are willing to follow the sustainable issues,” Coldefy says, “but their main concern is about their construction budget, which follows the local and world economy.”

Barbara Campagna, FAIA, applauds COP21 for focusing the world’s attention on energy and climate, and she says it should spur investment in renewable energy. “As someone who works in both big cities and medium-to-small cities, the disparity between sustainability efforts is huge,” says Campagna, an assistant professor and acting chair in Sustainable Interior Environments at the SUNY Fashion Institute of Technology graduate program. “Few architects and owners apply real, meaningful sustainability efforts to projects unless they are required by the client or the jurisdiction.”

It stands to reason that the more demanding the clients are, the more architects will respond to their demands. And the way to create more demand for energy efficiency is to reach more average people, which was certainly one of the outcomes of COP21. “I do not believe a ‘commitment’ that is primarily focused on architects can promote greater public awareness,” Campagna says. “It needs to be retooled in a way that the average person, who may not even know an architect but cares about recycling and saving energy costs, can readily understand it and feel like it impacts their life. Tax credits for solar energy—that impacts public awareness.”

If there is a leadership gap when it comes to addressing climate change, it may fall to the next generation of architects to close it. “There is criticism of the Paris agreement that it has generated false hope,” says Danielle Mitchell, ASSOC. AIA, president of the American Institute of Architecture Students based in Washington, D.C., “but sparking global hope is a good place to start. I believe it is our turn to up the ante and increase our voice through our actions. The building industry community now has an opportunity to take both the achievements and the criticisms from Paris to push ourselves and our goals further.” **AIA**

**“Few architects and owners apply real, meaningful sustainability efforts to projects unless they are required by the client or the jurisdiction.”**  
—Barbara Campagna, FAIA

# AIAAdvocacy

## Who to Watch in Architecture Policy: Rep. Frank Pallone

**With infrastructure top-of-mind in the national debate about resilience, architects are essential to American growth and security. A top Democrat details the role that architects play in energy, environment, and commerce.**

Congressman Frank Pallone, Democrat from the Sixth Congressional District of New Jersey, thinks architects do a great job getting out their message in Congress. He'd just like to see more of them up on Capitol Hill doing just that.

"I've known for years that architects have always been at the forefront of environmental concerns," says Pallone, a Long Branch, New Jersey native. "It's important that, as a group, you continue your efforts to communicate the importance of advancing low-carbon building technologies and building efficiency to both Congress and the public."

Pallone is the ranking Democrat on the influential House Energy and Commerce Committee, which has jurisdiction over issues pertaining to energy, environment, healthcare, commerce, and telecommunications. As such, Pallone has taken a leading role in opposing efforts by special interests to repeal Section 433 of the Energy Independence and Security Act (EISA), which sets targets for reductions in fossil fuel use in federal buildings by the year 2030. Architects and the AIA campaigned long and hard to get EISA passed; it was signed into law by President George W. Bush in 2007.

"What I have found, when it comes to environmental concerns, is that architects have always been out front in trying to be the good actor—and it's no surprise to me that you have this 2030 Challenge, and that you're trying to address global climate change issues or reduce greenhouse gas emissions," Pallone says. "The reality is, you've played a role in advancing more sustainable policies—and this is a good example."

Pallone, at least, recognizes that architects have a lot to say in the halls of Congress.

"In terms of buildings, residential and commercial buildings account for roughly 41 percent of the energy consumed in the United States," he says. "There's no question we



PHOTOGRAPHY: CARL BOWER

need to heat our homes and cool our homes and light our workplaces more efficiently with cleaner energy sources. And, of course, the U.S. federal government is the largest building owner, so federal buildings are crucial to reducing carbon emissions.

"That's where policies like the fossil fuel reduction requirement, Section 433, come in. It ensures that the federal government at least leads by example in transitioning to less polluted buildings."

Despite Pallone's opposition, the House voted to repeal the 2030 targets in December when it passed the North American Energy Security and Infrastructure Act of 2015. However, Pallone is confident the repeal won't soon become law, as the Senate, at press time, continues to be bogged down on its energy bill. And President Barack Obama has promised to veto the House bill that contains the repeal.

Throughout his tenure in Congress, Pallone's legislative accomplishments have been geared to the protection and restoration of environmental resources. A year ago, Pallone was sworn in for his 14th

Congressional term representing a New Jersey district that covers most of Middlesex County as well as the oceanfront areas of Monmouth County. These areas were hit particularly hard by Hurricane Sandy in 2012.

"In the aftermath of Sandy, in my district we've been looking at the telecommunications infrastructure, the transmission lines of electricity; we've been looking at plans for flood control projects with the Army Corps [of Engineers]," Pallone says. "All these things are necessary to make our infrastructure more resilient in the event of another storm."

Looking forward—and past the November elections—Pallone plans to revive the energy bill in the House and pass a truly bipartisan piece of legislation: "My hope is that we revisit this bill so it includes some energy infrastructure initiatives in it. One of my major priorities is that we try to revisit this whole energy package and include some major initiatives with regard to energy infrastructure: repair, replace, and resiliency." **AIA**

John Schneidawind

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# AIA Design



## 30 Years of High Performance

**An energy leader who preached efficiency before there were buzzwords.**

The last few years have been a boon for energy efficiency and sustainable design. Ideas that were niche and segmented have spread throughout the profession, gaining more and more traction as the world finally stirs to unite against the threat of climate change.

But before there were Web-based project-data reporting tools and the 2030 Challenge, before the Predicted Energy Use Intensity metric was on the tips of tongues, there was Norman Strong, FAIA, who has spent the bulk of his 30-year career focused on energy.

"Back in the late 1970s," Strong says, "we were working on energy efficiency before it became 'sustainability.' The whole idea of 'sustainable design' occurred after we were involved. I think the earth-sheltered movement in the late '70s and some of the passive solar work we did at that time made us aware of the importance of not only sustainability, but also high-performance and energy-related projects."

"When I was in school," he adds, "the idea of sustainable practices was 'reduce, reuse, recycle.' Now it's, 'What's your carbon footprint?' It's a new way of looking at it."

Strong has traveled across the country preaching the need for high-performance and carbon-neutral buildings, bringing energy-centric ideas to audiences before they seep into the profession, let alone enter broader culture in general. He's a trendsetter, albeit a reserved one.

"He has a huge depth of knowledge and history in this field," says Maurya McClintock, ASSOC. AIA, director of McClintock Façade Consulting and Strong's associate on the AIA's Energy Leadership Group. "And yet, like most of the people involved, he plays it down. He's very modest about his capabilities."

His track record speaks for itself. Since 1979, he's been with the Miller Hull Partnership (2003's AIA Architecture Firm Award recipient with offices in Seattle and San Diego), whose work on the Bullitt Center in Seattle placed on the AIA COTE Top Ten in 2015. He was named a Fellow of the AIA in 2004, which was followed by a stint as AIA national vice president from 2005 to 2007. He also chaired the Sustainability Discussion Group, a gathering of similarly minded energy aficionados who tackled endeavors such as

providing 50 strategies that would produce 50 percent fossil-fuel reduction in buildings.

"Back in 2005," he says, "I was a part of the AIA's Board of Directors and we voted on what were then these outrageous and incredible, but important, goals of sustainable reduction. Reduction in carbon emissions and the use of best practices: That, in itself, was the starting point of what came next."

"I completely credit Norm for my career path," says Maureen Guttman, AIA, president of the Building Codes Assistance Project and a fellow member of the Energy Leadership Group. "We served on the [AIA National] board of directors at the same time, and the importance of the sustainability position statement he advocated for in 2005 was so vital and necessary to our continued viability as leaders. He and his firm are among a very small number who talk the talk and then walk the walk."

Yet Strong's goals, while moral and ethical in nature, aren't part of a single-minded focus on saving the planet. As a key partner at an influential firm, he can be a realist when it's needed; he cherishes the impact of his work while recognizing that environmentally beneficial projects won't get the needed buy-in unless they're also good business.

"What's wrong with saving a client money?" he asks. "That's critical. It cuts

# AIA Design

CONTINUED

beyond it being a political issue and becomes a smart business decision where—oh, by the way—it also helps the world if you do this.”

He’s also not a buzzword fan. He knows there are catchalls that speak to a larger audience, but he’d rather use a term that sums up what he really means.

“The word ‘sustainability’ is used and misused in a lot of ways,” Strong says, “but ‘high performance’ is something you can get your arms around. It also helps expand what we’re aiming for: high performance in energy, water, wind—any resource that goes in or comes out of the process.”

And that is Strong’s main focus for 2016: what comes next. Having been around the energy game for decades, he’s looking at what will matter to those who will take up his life’s work among today’s emerging professionals.

“Certain parts of the country are now more aware of what we’re doing to both the climate and the planet,” he says, “but we’re getting to the point where full buy-in is needed today, not in the future. Because the future is now, we need to take on the next big hurdles, like building renovations.”

A large part of that is moving past the traditional scope of architecture: For example, the AIA 2030 Commitment has launched a new Design Data Exchange tool that its firms use to report their projects’ energy data, but Strong believes we need something that evolves over time to include water and capture a building’s broader performance.

“We’re hiring people with chemistry or science backgrounds that go beyond the applied sciences of design,” he says. “Design is important, but you also need to know what’s in that design, what’s in that building. “It’s not typical,” he adds, “but it’s something that’s needed.” **AIA**

Steve Cimino



ABOVE AND PREVIOUS PAGE: The Bullitt Center in Seattle, designed by the Miller Hull Partnership, was completed in 2013 and has been called the “prototype high-performance urban office building.”

# AIA Perspective



PHOTOGRAPH: CARL BOWER

## Is Green the Old Black?

### Moving beyond fashionable labels.

As an architect, I understand the fashion value of wearing black. I also understand the profession’s commitment to being green. But the recent history of green has had a more uneven trajectory than the consistent (if unofficial) uniform that architects don.

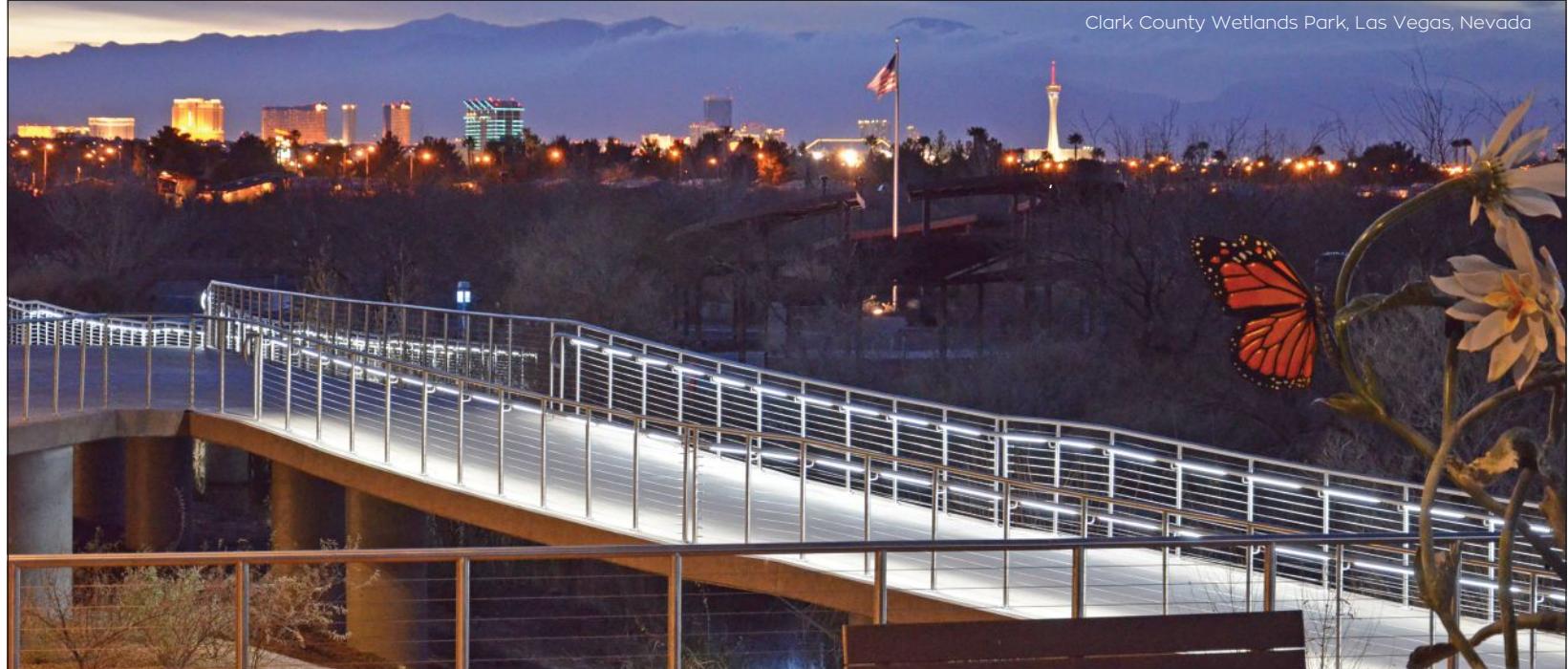
I became interested in sustainable design in the late 1970s and absorbed everything I could on passive solar design. I clearly remember reading about the architectural frontier that included a new wave of architectural awareness that was sweeping the country in the preface to *Passive Solar Architecture: Logic & Beauty* (Van Nostrand Reinhold, 1983), written by Dennis A. Andrejko, FAIA, and David Wright, FAIA. Another text that drew me in was *The Passive Solar Energy Book* (Rodale Press, 1979), by Edward Mazria, FAIA, which remains the bible on the topic. I studied the formulas and solar gain calculations (and later jumped to a TI SR-50 calculator for the task). My first architectural designs were passive solar houses constructed in the early 1980s. While many of us were so enthusiastic about the possibilities of passive solar back then, it seemed to fade

once the energy tax credits evaporated after President Jimmy Carter left office.

Cycles of enthusiasm have affected the inclusion of sustainable elements in architecture before today, and it seems that it may be happening again. Yet passive solar design has evolved since that time, as has the AIA’s commitment to sustainability. The AIA Energy Modeling Practice Guide (which does not require a TI SR-50) is a powerful new tool for architects to understand the future impact of design decisions. Indeed, the AIA continues to take a big-picture approach to Sustainability (with a capital “S”), which includes a nascent materials transparency program and an Institute-wide focus on resilient design solutions. It’s an approach that goes beyond mere energy consumption and rating systems.

While interest from the client side may fade with lower energy costs, the AIA is here to help all practitioners broaden the definition of sustainability so that we can better demonstrate its relevance to all clients and building types. In that sense, architects follow in the tradition of pioneers like Andrejko, Wright, and Mazria, who were leaders early on, by differentiating themselves and pushing the envelope of what sustainability really can and should mean. **AIA**

Russell A. Davidson, FAIA  
2016 AIA President



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# UNDERSTANDING TAX BENEFITS OF 179D FOR DESIGN FIRMS

Presented by:

**Concord**



By Andrew Hunt

## SECTION 1—UNDERSTANDING SECTION 179D

This section will provide a brief of the history of Section 179D and explain the overall relevance of this tax deduction for both commercial and public projects. Specifically, this section will look at why Section 179D was created and how it has been used and underutilized in the design process. This section will narrow the target audience to designers working on public projects.

### Introduction to Section 179D

In 2005, Congress enacted the Energy Policy Act of 2005, also known as EPAct, and in so

doing created the Energy Efficient Commercial Building Tax Deduction, which recognizes the impact commercial buildings have in the overall U.S. energy consumption. The tax incentive was created as a means to provide building designers a way to incorporate more energy efficient design choices in their projects as a way to offset the larger project cost. Section 179D of the code enables the building owner to deduct the cost of the energy-saving systems from \$0.30 up to \$1.80 per square foot, depending on whether the building is eligible for a partial or full deduction.

Congress also added a provision that encourages energy-efficient design in

## LEARNING OBJECTIVES

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

1. Describe what Section 179D is and how this tax deduction can benefit design industry.
2. Explain the three main areas of improvement targeted with the Section 179D incentives.
3. Understand the process required to take advantage of the Section 179D deduction for designers.
4. Discuss the update on the extension of Section 179D along with the ASHRAE changes for 2016 projects.

## CONTINUING EDUCATION

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public, or government-owned, buildings. In this case the building owner can allocate the deduction to the building designer or design firm, since government buildings are not taxed. While the commercial application of this code has been used to some extent, the application to public buildings has been even less so. The benefits for designers of larger government buildings can be considerable, yet they are often overlooked because of the complexity associated with taxes in this context, and because they are unclear how to navigate the issues. For example, some government owners may request an incentive for signing the allocation letter. This request may be in the form of extra work, discounted fees, or possible

financial rewards. Designers will not be asked to share the benefits when working on any federal projects. The specific tax issues are beyond the scope of this article, however designers interested in pursuing the deduction should consult with their tax advisor to assure that their individual situation and project warrants the use of this Section 179D deduction.

Since it was initiated, the 179D deductions has leveraged billions of dollars in private capital, resulted in energy-efficient construction of thousands of buildings, and created and preserved thousands of jobs. It has lowered demands on the power grid, moved the U.S. closer to energy independence, and reduced carbon emissions.

#### **IRS definition of "designer" for a government-owned building**

The federal tax codes identify a building designer as "anyone who creates the technical specifications for installing the qualifying property and its subsystems; it can include architects, engineers, contractors, environmental consultants, energy service companies (ESCOs) or others". Building professions responsible for just installing, repairing, or maintaining the property are not considered "designers", and thus are not eligible for the deduction.

#### **Eligible energy-saving systems**

The three energy-saving systems eligible for the deduction include the interior lighting systems, HVAC and hot water systems, and the overall building envelope. The deduction associated with Section 179D can be as much \$1.80 per square foot of the property, taken in the year that the project goes into service. Section 179D allows the designer to take a federal deduction up to \$1.80 per square foot or the project costs attributable to the subsystem receiving the deduction. The deduction cannot exceed the full project cost. The deduction is available for costs directly associated with the three systems for the deduction for buildings put into service or retrofitted after December 31, 2005 and before December 31, 2016.

The incentives provided by this feature of the tax code can help building designers increase their profits substantially, however many designers are unfamiliar with Section 179D, or are not certain how to make the most of this deduction. The provision is particularly beneficial to the designers of government

buildings. Impacts of the code will be discussed in more detail later in this section.

#### **The intended and actual impacts of Section 179D**

The General Services Administration (GSA) is responsible for constructing, managing, and preserving government buildings, and for leasing and managing commercial real estate. The GSA owns and leases over 376.9 million square feet of space in 9,600 government buildings across the United States. These properties include land ports of entry, warehouses, courthouse, post offices, laboratories, and data processing centers, to name a few. As noted above, Section 179D was set in place to help the government meet its goals of energy independence by helping ensure that new and retrofitted buildings were making the most out of energy-efficient innovations. The deduction has not been widely used by either the private or public sector, and the uptake on government structures has been nowhere near the expected increase. This is in part because designers have simply been unaware of the potential deductions and how to acquire proper certification – and thus profit on such projects. With such a vast number of buildings that may be retrofitted, as well as the newer projects that are commissioned, designers will benefit from understanding the conditions under which projects may be eligible for the deduction.

#### **Relevance to commercial buildings**

In the case of commercial buildings, the owners are eligible for the deduction if the building is properly certified. For commercial properties, as well as government properties, that are unable to meet the minimum 50% energy and cost savings, the Energy Efficient Commercial Building Deduction allows deductions for partially qualifying projects in the individual building subsystems. These reduced deductions range from \$0.30/square foot to \$0.60/square foot for lighting and \$0.60/ square foot for HVAC or the building envelope, depending on the extent of the energy-saving measures.

#### **Relevance to public buildings**

As noted earlier, government-owned buildings are subject to a special rule when it comes to the Section 179D deduction. Unlike commercial buildings, where the owners are eligible for the deduction, the owner of a government property (federal, state, or local) may allocate the deduction to the property's designer. The



Internal Revenue Code defines the designer to be the building's "architect, engineer, contractor, environmental consultant, or energy services (ESCO) provider who creates the technical specifications for a new building or retrofit to an existing building that incorporates energy efficient building systems."

A government building is any building that is owned and operated or leased by a government authority or agency. This includes all levels of government, from Federal, state, and local governments, and can include post offices, schools, hospitals, jails, administration buildings, or research facilities, among other property types.

#### **Relevance to design firms**

Given that the owners of government buildings and public projects can – and often do – allocate the energy efficient building tax deduction to the building's designers, building design firms have much to gain by applying for Section 179D certification. At a potential \$1.80/square foot deduction, savings can be huge, especially if they are able to secure larger government building projects. Projects with larger footprints – ideally 50,000 square feet or above – are the best candidates.

Firms that are contracted to implement energy-saving systems in government-owned buildings may find that the tax deduction allows them to rethink their design choices to include more innovative technologies. Section 179D is technology neutral, and thus the architects and designers have flexibility in the design systems for their projects. Moreover, firms that implement such innovative design features, and who can prove via a third-party certifier firm that their work can achieve the Section 179D deduction, may find that they are considered to do more work in the area of green building design and retrofit.

## SECTION 2—SATISFYING SECTION 179D REQUIREMENTS

This section will explain the specific requirements for satisfying Section 179D. Keeping with the general focus on public buildings, this content will address the three areas of improvement: lighting, HVAC systems, and building envelope. Included in this content will be ways that help achieve the energy and power savings necessary for a partially qualifying deduction, or in the most expansive energy efficient projects where the \$1.80/square foot deduction for the whole building is achieved. This can be best done through informed consultation with third party certifiers to review specifics from projects for prequalification. Included in this section will be some of the more common types of buildings and projects that can qualify for Section 179D, and that can benefit most from the deduction.

### Section 179D Requirements

Buildings and properties can qualify for the full Section 179D deduction of \$1.80/square foot if they meet the requirement of reduced energy use of for the whole building that is certified to exceed ASHRAE Standard 90.1-2001 by at least 50 percent. For projects completed in 2016, the ASHRAE 90.1-2007 standard replaces ASHRAE 90.1-2001.

Buildings that are unable to meet the 50% or greater energy and power savings requirements are eligible for partial deductions of a maximum of \$0.60/square foot for each individual energy-saving system that they can implement. For example, a retrofit project may only be able to include energy efficient updates to the lighting

system, in which case they would be eligible for a partial deduction. Alternatively, they may be able to improve both lighting and the building envelope, but not HVAC, in which case they would get two-thirds of the deduction.

Properties that make energy efficient changes to the lighting may qualify for a maximum deduction of \$0.60 per square foot via Section 179D under the Interim Lighting Rule. In cases where the lighting density is reduced less than 40% of the maximum, the deduction is reduced by \$0.02 per square foot for every lighting power density reduction point below 40%.

To be eligible for the Interim Lighting Rule, properties must meet the following criteria:

1. Reduces lighting power density by at least 25% of the minimum requirements outlined in the ASHRAE Standard 90.1-2001 (or 50% if the property is a warehouse). See Table below.
2. Includes circuiting and controls that meet in full the strict requirements by Standard 90.1-2001
3. Provides bi-level switching options for all occupancies other than motel and hotel guest rooms, store rooms, restrooms, and public lobbies. Partial deductions are applicable.
4. Meets minimum required lighting levels calculated and presented in the IESNA Lighting Handbook, Performance and application, Ninth Edition, 2000.

Buildings must be inspected by a third-party certifier, which will verify that the energy-saving installations have been made and that they

meet the requirements. Designers should consult with their third-party certifier to review project specifications early in the design process to determine potential feasibility for the Section 179D deduction.

In order to be considered for the Section 179D tax deduction, properties must meet the following requirements:

1. Must be located in the U.S.
2. Must have installed energy-efficient improvements as part of the interior lighting system, the HVAC and hot water systems, or the building envelope
3. Must be certified having designed and installed all or some of the above systems with the intention of reducing the total annual energy and power costs by 50% or more in comparison to a reference building that meets the minimum requirements of ASHRAE Standard 90.1-2001. Projects in 2016 must meet the ASHRAE 90.1-2007 standards.

Eligible energy-efficient systems include:

- Interior lighting systems
- Heating systems
- Cooling systems
- Ventilation systems
- Hot water systems
- Building envelope

Systems not eligible include:

- Power reductions
- Refrigeration reductions
- Other energy-use reductions

### Types of projects that can benefit from Section 179D

As a general guide, buildings that exceed 50,000 square feet are the best candidates to complete the process of being certified for the deduction. Buildings with a smaller footprint can certainly benefit from energy-efficient designs and retrofits, however, the deduction may not be enough to warrant the certification process. This section highlights the types of projects that most benefit from the Section 179D deduction.

Designers of all publicly owned facilities such as schools, libraries, courthouses, or post offices can all benefit from the 179D deduction. For example, some of the largest buildings that qualify are schools, which may range from 50,000 to 1,000,000 square feet. Whether

### SUMMARY OF ENERGY SAVINGS PERCENTAGES PROVIDED BY IRS GUIDANCE

	Under Notice 2006-52	Under Notice 2008-40	Under Notice 2012-26	Benefit (Per Ft <sup>2</sup> )
<b>Lighting (Interim Rule)</b>	25–40% LPD reduction	25–40% LPD reduction	25–40% LPD reduction	\$0.30–\$0.60
<b>Lighting (Permanent Rule)</b>	16 2/3%	20%	25%	\$0.60
<b>HVAC and HW Systems</b>	16 2/3%	20%	15%	\$0.60
<b>Building Envelope</b>	16 2/3%	10%	10%	\$0.60
<b>HVAC, HW, Lighting and Envelope</b>	50%	50%	50%	\$1.80
<b>Effective Dates</b>	1/1/2006–12/31/2008	1/1/2006–12/31/2013	3/12/2012–12/31/2016	

designers are involved with new projects, rehabilitating, or retrofitting older public buildings, it may be worth their effort to have a consultation done on the property to see whether it would be a good candidate for the deduction. Building designers may be in a position to significantly increase their project profits while providing energy-efficient designs on public buildings. The design options are vast. For example, designers may be able to:

- Design in or update interior lighting from fluorescent or incandescent lighting to more efficient LED options.
- Include or update the HVAC and water heating system to use variable speed and more efficient fans.
- Design or modify the building envelope to include more energy efficient materials that may add to passive heating or cooling.

Different projects will offer different energy-saving options. For example, occupied buildings such as offices, schools, hospitals, or detention centers may benefit from one or all of the energy-efficient systems. Unoccupied buildings, such as parking garages, may benefit from only one or two—for example, improved lighting options.

Owners of commercial properties can benefit from including energy-efficient features, whether the building is an office, a warehouse, a supermarket, or a multi-family midrise apartment. Designers interested in doing preliminary calculations to see what potential benefits might be for their project can check here: [concordenergystrategies.com/179d-tax-deduction/benefits-calculator/](http://concordenergystrategies.com/179d-tax-deduction/benefits-calculator/)

Regardless of the project, it is important for building designers to consider implementing these energy-efficient options, and to explore Section 179D eligibility with a third-party certifier during the preliminary design phase.

### SECTION 3—PROCESS OF ACHIEVING SECTION 179D

This section will provide a step-by-step process map for architects to follow in order to successfully qualify a project for the Section 179D tax deduction. Content will address, from start to finish, the important milestones and critical needs for successful documentation and completion of the process. Included in this section will be suggestions and guidance on selecting the appropriate third-party independent energy certifier, their role in the process, and an overview of possible fee structures, and deliverables.

### QUIZ

1. What year was the EPAct enacted?
  - a. 1990
  - b. 2000
  - c. 2005
  - d. 2010
2. What section of the EPAct code enables building owners to deduct the cost of the energy saving installations?
  - a. 1A
  - b. 179D
  - c. 1246Z
  - d. 2B
3. Under the federal tax code definition, which of the following can be identified as a “designer?”
  - a. Repair person
  - b. Maintenance person
  - c. Contractor
  - d. Installer
4. Which is not listed as a deductible energy saving system?
  - a. Interior lighting systems
  - b. Building envelope
  - c. HVAC/Hot water systems
  - d. Refrigeration reductions
5. Which of the following can be considered a government building?
  - a. Post office
  - b. School
  - c. Hospital
  - d. All of the Above
6. True or False? Buildings in Canada and Mexico are eligible for the Section 179D tax deduction.
7. Who conducts the Section 179D deduction certification?
  - a. Contractor
  - b. A third party certifier
  - c. Federal government
  - d. All of the above
8. Ideal candidates for consideration of the Section 179D deduction are buildings that exceed how many square feet?
  - a. 5,000
  - b. 10,000
  - c. 20,000
  - d. 50,000
9. Which of the following would not be an eligible energy efficient system?
  - a. Adding a power reduction system
  - b. Replacing incandescent lighting with LED lighting
  - c. Geothermal HVAC system
  - d. Using high performance insulation
10. A building that qualifies for the lighting deduction but not the building envelope or HVAC/hot water systems deductions can earn how much of a maximum deduction?
  - a. \$0.10/sq ft
  - b. \$0.40/sq ft
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“How did this piece  
of publicly funded  
infrastructure,  
one built for so  
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wind up being  
so gorgeous?”

**How the Salt Shed Happened** by Karrie Jacobs

At the corner of Spring and West Streets in lower Manhattan, sandwiched between a ventilation tower for the Holland Tunnel and the Hudson River waterfront, there is a large, jaggy object that could be a monument. It looks like the sort of commemorative hunk of marble you might find along the National Mall in Washington, D.C. Except that it's not marble: the lovely mottled surface of the crystalline polygon is cast-in-place concrete. And the building, completed late last year, doesn't commemorate anything. As Claire Weisz, FAIA, a partner at WXY, which collaborated on the project with another New York-based firm, Dattner Architects, puts it, it is a building "about salt."

More accurately, it is a building containing salt: 5,000 tons of it, waiting to be scattered on roadways by the truckload when it snows. If you visit the Spring Street Salt Shed and walk around the creased perimeter, you'll encounter a giant garage door, about four or five stories tall. It opens onto a huge, concrete-lined room containing a mountain of salt in cappuccino colors: light brown and white. It could be a work of minimalist sculpture, something by environmental artist like Andy Goldsworthy. The building, inside and out, is so off-kilter and so wonderful that it's hard to believe it exists. How did this roughly \$18 million piece of publicly funded infrastructure, one built for so quotidian a purpose, wind up being so gorgeous?

The short answer is this: New York's Department of Sanitation (DSNY) has an in-house architect named Mike Friedlander. In more than 30 years of working for the department, he's developed a strategy for circumventing the objections that neighbors (who, in this case, included celebrities like John Slattery and the late James Gandolfini) generally have to the construction of one of his facilities. His secret, he says, is "build the best building in the neighborhood."

But the Salt Shed exceeds even Friedlander's standard. It is *sui generis*. And in New York City, there never truly is a short answer. The long version starts in the 1990s with the Hudson River Park, a 4-mile-long waterfront recreation facility that forced the DSNY to abandon a couple of piers that the agency had long used for parking and storage. To replace the piers, the city purchased a large parking lot on West Street from UPS and began planning a new garage for garbage trucks. The road salt was, originally, supposed to be stored on the first level of the garage. But the city instead sold the first floor back to UPS as an industrial condominium, and the salt storage was relocated to a small, triangular site across the street occupied by an obsolete 1920s sanitation garage, one too small to house today's garbage trucks.

The Spring Street Salt Shed



There were a number of key players. There were, of course, the architects: Dattner has a reputation for designing solid, high-quality public buildings in New York City, commissions that don't afford the firm much opportunity to dazzle. WXY is a much smaller firm, with a staff of about two dozen, a deft touch, and many eye-catching projects to its credit, such as the swirlly new Rockaways boardwalk in Queens that replaced the one washed away by Hurricane Sandy. Dattner invited WXY to partner up in a response to a 2005 RFP for the sanitation garage. For Weisz, it was an opportunity to land a project that was bigger and more complex than anything her firm had ever tackled on its own: "We thought this was our chance to actually do a large-scale civic, industrial building," she says. For Dattner, according to principal Paul Bauer, AIA, it was "a good teaming opportunity."

#### A Soft-Spoken Advocate

The most crucial player, however, doesn't appear on the project credits. In 2004, David Burney, FAIA, was appointed by Mayor Michael Bloomberg to be commissioner of the Department of Design and Construction (DDC). The DDC, charged with erecting all of the city's public buildings (with the exception of schools) and also much of its infrastructure, was a workhorse agency not well known outside government. But Burney, a soft-spoken English transplant who had previously been the director of design for the New York City Housing Authority, made it his mission to upgrade the quality of libraries, firehouses, EMS centers, and streetscapes. Burney was inspired by a General Services Administration initiative to improve the design of federal buildings, as well as by a manifesto called "Guiding Principles for Federal Architecture," which was written by Daniel Patrick Moynihan in 1962 (before he was a senator). "Major emphasis should be placed on the choice of designs



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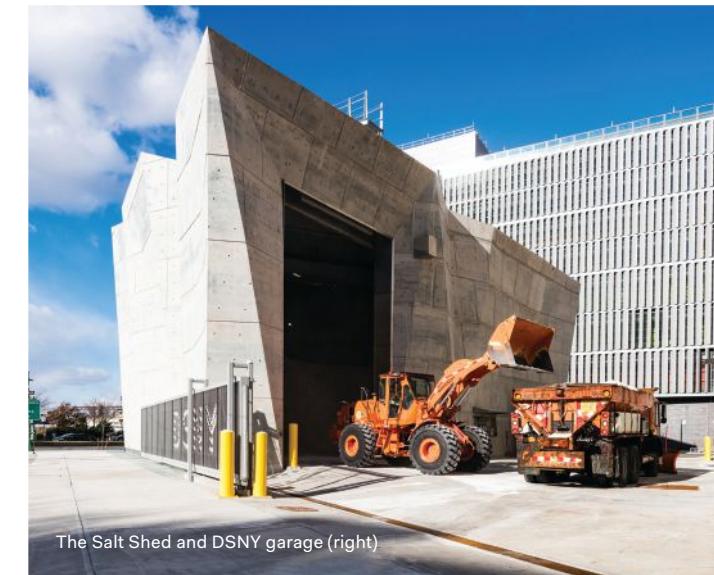


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The Salt Shed and DSNY garage (right)

that embody the finest contemporary American architectural thought," Moynihan wrote.

Burney arrived at an agency as hidebound as any other, where architectural selection was determined by the rules of government procurement. "Whoever was cheapest got the job," Burney recalls. One former agency creative director, Victoria Milne, who began working there in the 1990s, called the DDC regulars "change-order artists": architects who know "how to deliver on time and on budget—and how to increase fees through change orders."

Determined to do better, Burney found an ally in Marla Simpson, the director of the Mayor's Office of Contract Services, who helped him devise a way to do "innovative procurement." The DDC decided to issue RFPs at a set dollar amount. Because the architectural fee was a given, there could be no low or high bids, and architects were judged on their portfolios and their technical skills. Smaller firms could apply for \$4 million contracts and larger firms for contracts worth \$10 million. By 2005, the agency began hiring architects under Burney's initiative, which he called Design and Construction Excellence. A few years later, beautifully designed and crafted public buildings began rising: a swooping Staten Island police precinct by Rafael Viñoly Architects; a handsome, terra-cotta-clad center for homeless families in the Bronx by Ennead Architects; a daylight-filled library in Queens by Marble Fairbanks. As Milne recalls, the change "felt glorious and rewarding, as though we were doing something great for the city."

### The Salt Shed as Fluke

The firms that designed the Salt Shed and the garage were hired in 2005 by the DSNY, but the process was informed by the DDC's design excellence agenda, and the project was built by the DDC. It is exactly what



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you'd expect from a collaboration between Dattner and WXY: The garage (which cost \$194 million) is muscular but nuanced. It has a green roof that harvests rainwater, which is stored in a cistern and used for washing garbage trucks. It has color-coded floors (a different hue for each of the three sanitation districts housed within) visible through a glass curtainwall and movable louvers that help regulate sunlight, keeping the building warmer in winter and cooler in summer. The facility is heated by steam piped in from a Con Edison plant, which also drives a turbine that supplies about half the electricity needed to light the building. The project was shaped by the usual stew of conflicting forces, including the concerns of those celebrity neighbors. The architects, says Bauer, did everything they could to make a building for giant trucks "more people scale," including shaving 12 feet off the garage's height.

But the Salt Shed is even more of a fluke. According to Friedlander, the crusading community members didn't want a shed that was in any way open. "They were afraid of the salt. We were ordered to build a sealed building." He says that his office and both architecture firms were staying up nights trying to figure the thing out. Several times, the architects had to show their work to the Public Design Commission (PDC). A little known body (originally the Municipal Art Commission), it was established by the city charter in 1898 and must sign off on all public buildings, structures, and spaces. (During the Bloomberg years, the commission was unusually potent, but several of its high-profile members have since resigned and it reportedly no longer receives the same level of support from City Hall.)

One of those former commissioners, James Polshek, FAIA, saw an early version of the Salt Shed—one with concrete walls that had a strip of polycarbonate material at the top—and didn't care for it. "It seemed to me that this is a very important site because it's the entrance to the Holland Tunnel," he recalls. The garage was "a very neutral building," he thought, shaped by neighborhood complaints. But the Salt Shed could be something entirely different. During a PDC meeting, Polshek Googled "salt" and, after looking at highly magnified photos, suggested that the building be more sculptural, that it should resemble a salt crystal. According to Friedlander, at one meeting, "Polshek crumpled up a piece of paper and said, 'Do this.' We said: 'Can we have this piece of paper?'" When I asked him about the crumpled paper, Polshek told me, "I definitely did that."

So the crazy concrete object is either a stylized salt crystal or a crumpled piece of paper. Either way, it's lovely. It is, in fact, a monument. It represents the apotheosis of Design and Construction Excellence

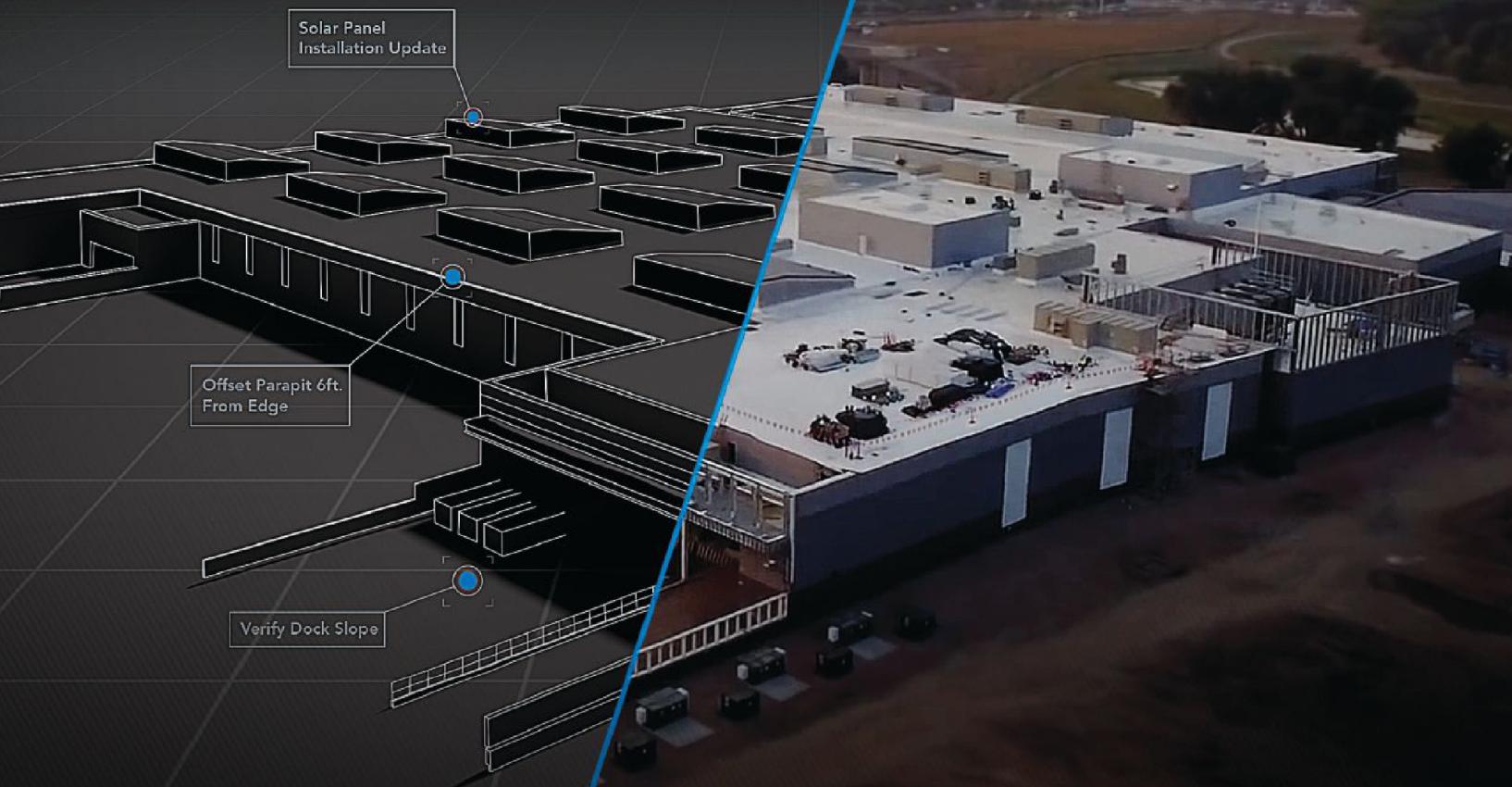
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#### A Mayor's Lenses

The current mayor, Bill de Blasio, and his administration are not known for their enthusiasm for

urban design. They don't do aesthetics. The DDC is still using Burney's design guidelines to hire architects, but they have updated the program, which is now called Design and Construction Excellence 2.0. An engineer named Feniosky Peña-Mora, who became the DDC's commissioner in 2014, explains that the department revised the approach based on "lenses" delineated by the mayor in a document called OneNYC. Peña-Mora lists them: "a growing city, an equitable city, a sustainable city, a resilient city, and also a healthy city." He continues: "In Design Excellence 2.0, one of the things we are asking, as our designers are coming up with ideas, is how do you incorporate those values, those lenses, those goals, into your designs?"

Concepts like sustainability, resilience, and health are easy. In New York City, LEED Silver has been a minimum requirement for all publicly funded buildings since 2005. And in 2010, the city published a landmark handbook of strategies (authored by the DDC and other agencies) for healthier buildings and urban environments. The drive for equity, however, is de Blasio's political signature, and it doesn't suggest an obvious architectural response. When I ask Peña-Mora how equity plays out in built form, he points to renderings of a Bronx police precinct designed by the Bjarke Ingels Group (BIG). The firm was awarded a contract in 2013, under the previous administration, but the design is one of the first to be issued by the new DDC leadership.

At the time the project was getting started, the city was embroiled in the controversy over Eric Garner, who died when an arresting officer held him in a choke hold. "It was almost an aha moment," says Peña-Mora, "in which everybody came together and said: This is a great opportunity to incorporate this notion [of equity]. We created a wonderful integration of public space." The precinct has a street-level room for community use at the front of the building, and the exterior wall of that room is

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View of a laptop screen displaying the AIAU website ([aiau.aia.org](http://aiau.aia.org)). The page shows a search bar with "Choose courses" and various filters for Core Competencies (Design, Practice, Building Science), Credits (ADA, HSW, GBCI, RIBA), Knowledge Level (Introductory, Intermediate, Advanced), and Sort by (Date, Title, Rating). Below the filters, there are six course cards:

Category	Course Title	Rating	Credits
P	Navigating Legal Issues Related to Sustainable Projects	4.5 (21 votes)	150 LU   HSW GBCI RIBA
D B	The 2030 Palette: Applications, Methods, Guidelines and Resources for the New Built Environment	4.5 (31 votes)	150 LU   HSW GBCI RIBA
P	Avoiding or Reducing Architect-Contractor Conflicts in Small Projects	4.5 (169 votes)	150 LU   RIBA
P	Change Management: How a Company Transforms to Gain New Business	4.5 (38 votes)	1.00 LU   RIBA
P	The New IDP and ARE: If You Only Knew	4.5 (30 votes)	1.00 LU   RIBA
D B	Deep Energy Retrofits and the Architect's Role in This Emerging Opportunity	4.5 (188 votes)	150 LU   HSW GBCI RIBA



conspicuously perforated, a very literal connection between inside and outside.

Another example of equity in architecture is a remodel of a 1970s public library in East Flatbush by LevenBetts. In this case, “equity” is represented by a transparent street wall that replaced an opaque one. “The one before is telling you stay away,” says Peña-Mora. “The message now is, ‘We really welcome you.’”

Neither of these architectural moves is exactly

unprecedented. Moreover, any time you deliver a thoughtfully made public building, park, plaza, or streetscape to an underserved neighborhood, you’re advancing the cause of equity. But in the realm of Design Excellence 2.0, it’s not enough to work conscientiously or make a good building; you need call out features that correspond to the “lenses.”

“It’s equity, equity, equity,” gripes Polshek who, after nine years on the PDC, quit in February. Speaking of

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the de Blasio administration's approach toward design, Polshek says, "It's all a matter of equality or inequality. There's no sense that the quality of the architecture itself could bring pride to the people who live in the city."

Faith Rose, AIA, who worked at the DDC as a design liaison under Burney, and who was

subsequently appointed as executive director of the PDC by de Blasio (a post from which she recently resigned in order to work in private practice with her husband, also an architect), is more generous. "I love the equity thing. I think it's right on," she says. "I actually understand why DDC is doing these lenses, because they're trying to figure out how to make design relevant" for people who don't understand or care about architecture. "I think that's really important and really valuable, because de Blasio is not the only one who doesn't get [the importance of design]," Rose says. "I would say that most of America doesn't get it."

I asked Margaret Castillo, FAIA, the DDC's chief architect (a new position under Peña-Mora) about whether equity and the other lenses are a kind of prosthetic device to help people like the mayor to see the value of design. "I think by reframing good design in those terms it won't seem like a luxury," she told me.

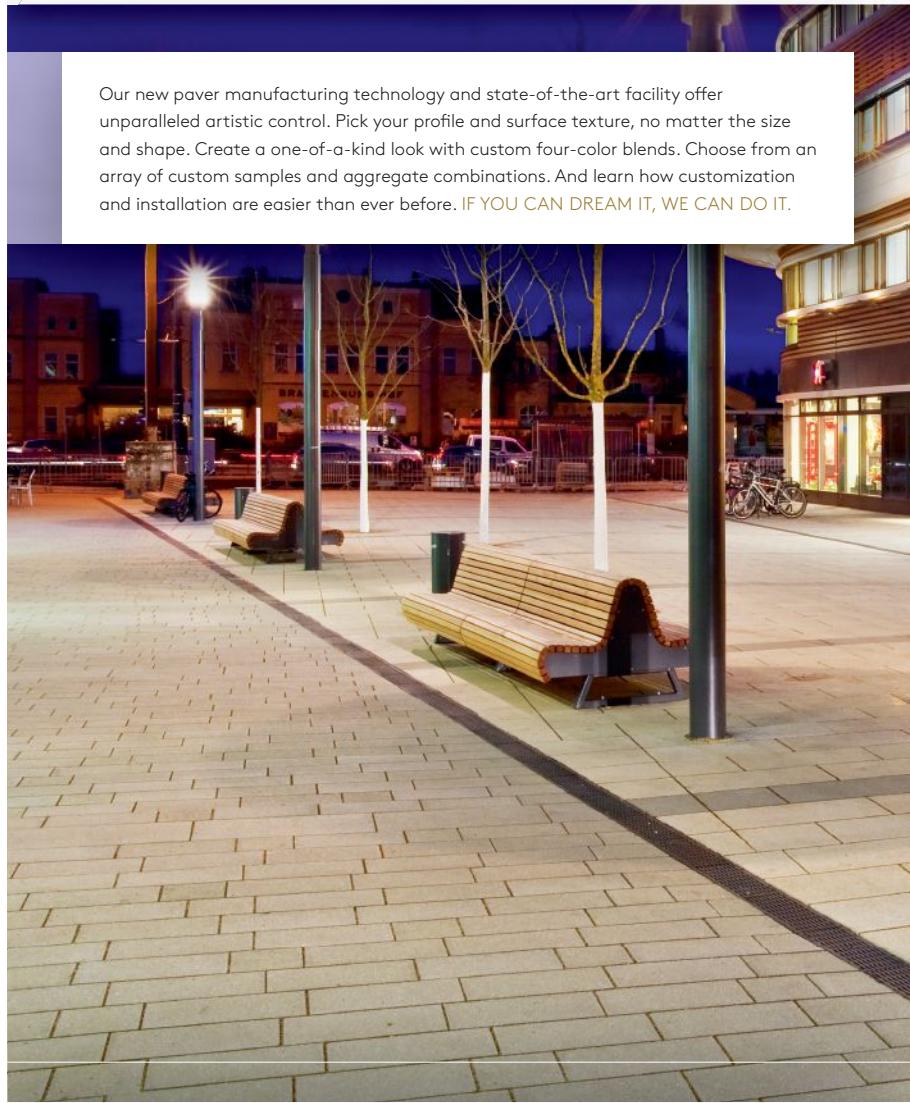
From the outside, it's hard to see how designs that cut EMS response times, or divert stormwater from the city's overtaxed sewer system, or give children safe, brightly lit places to play could possibly be viewed as a luxury. On the inside, it seems, the de Blasio administration needs to keep reassuring itself that its design excellence program responds to the larger agenda, the mayor's quest for "a strong and just city." It's not that there's anything wrong with his goals, but rather that the method of achieving them threatens to suck some of the life out of public architecture. Where is the lens of inspiring civic pride? Where is the lens of inspiring curiosity about the world? Yes, talented architects are still being hired to design public buildings, and while their portfolios are not evaluated solely on commitment to the lenses, every proposal is expected to incorporate them. Architects, of course, know how to talk a good game, but it would take an exceptional rhetorician under the current regime to defend something as unexpectedly spectacular as the Salt Shed.

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“Here was a client saying things like, ‘Have you ever designed a building without any mechanical system?’ The answer was, ‘No.’”

Inside the Rocky Mountain Institute’s New HQ by David Hill

If there's an organization that should be headquartered in one of the most sustainable buildings in the United States, it's the Rocky Mountain Institute (RMI), the Colorado-based nonprofit founded in 1982 and led by the energy efficiency guru Amory Lovins. Often called a "think-and-do tank," RMI works with corporate and government clients on resource-saving strategies. Long before LEED, RMI was preaching the virtues of passive solar energy and thick insulating walls. More recently, in 2009, the institute helped spearhead a \$550 million "deep retrofit" of the Empire State Building, which included converting every one of the skyscraper's 6,514 double-hung windows to superinsulated glass units.

In 1984, Lovins, now 68, famously designed and built a superefficient house in Snowmass, Colo., that became a model for low- and high-tech energy solutions. At the time, *Mother Earth News* gushed about the house's argon gas-filled double-glazed windows and low-flow Ifö Cascade toilet. Lovins and his then-wife, Hunter, RMI's co-founder, lived there, and for many years the building also served as the headquarters for the institute, which had about a dozen employees.

But after the nonprofit expanded, it moved into a 1950s ranch house on a nearby property owned by the Windstar Foundation, an environmental philanthropy founded by the late singer John Denver. RMI intended to build a new headquarters on the Windstar property, but when those plans fell through, the institute worked out a deal with the nearby town of Basalt, Colo., which was looking to develop a prime site overlooking the Roaring Fork River. Cara Carmichael, who manages RMI's Boulder, Colo., office, which opened in 2004, says the Windstar house had undergone some remodeling, "but it just

wasn't meeting our needs. It was leaky. Not very well insulated at all. Definitely not sustainable."

Finally, RMI has a headquarters worthy of its mission. In January, the organization—which today has more than 100 employees in offices around the country—moved into the new LEED Platinum and net-positive-anticipated RMI Innovation Center in downtown Basalt. (The posh resort town of Aspen is 18 miles to the east on Highway 82.) Designed by Portland, Ore.-based ZGF Architects, the building is meant to be both a comfortable office space for up to 50 RMI employees (about 25 work there now) and a showcase for sustainable design practices.

According to RMI, it's the most energy-efficient building located in North America's coldest climate zone, and uses 74 percent less energy than similar office buildings in the zone. Remarkably, there's only a small heating system—in the form of targeted electric floor mats, meant to be used only on the coldest days of the year, and whose collective output is equivalent to roughly 16 hairdryers—and no cooling system at all. Not bad for a project that sits at nearly 7,000 feet above sea level, where the average low temperature in January is about 4 F. "It's extremely rare for an office building not to have a central heating system," Carmichael says, "especially in this climate."

#### A Boundary-Pushing Client

ZGF partner Kathy Berg, AIA, says Lovins and his RMI colleagues tested the architects' limits. "That was exciting," she says, "because a lot of times we end up trying to encourage our clients to move in the direction of sustainability. Here was a client saying things like, 'Have you ever designed a building without any mechanical system?' The answer was, 'No.'"

Berg's colleague Justin Brooks, lead designer on the project, recalls ZGF's first meeting with Lovins, who began by asking several questions about building refrigeration and the R-value of glass. "We knew that this was somebody who was going to be pushing us on the technical side," Brooks says.

The two-story, 15,600-square-foot building takes full advantage of Colorado's intense sun with an 83-kilowatt photovoltaic generator on the roof, which provides enough energy for the structure plus five electric vehicles. (There's also a 40-kilowatt battery storage system that reduces the building's peak-energy demand.) Large south-facing windows allow passive solar gain in cooler months, while an automated sunshade system helps regulate light in the summer.

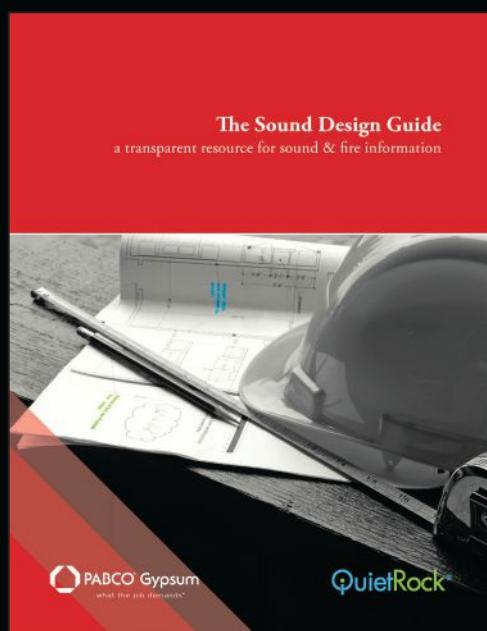
None of this would matter, of course, if the building weren't superinsulated. RMI opted for aggressive levels: R-50 for the walls and R-70 for



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Axonometric of the building, which features an 83-kilowatt photovoltaic generator on the roof, double-glazed windows filled with krypton gas, large south-facing windows that allow passive solar gain in the winter (an automated sunshade system helps regulates summer temperatures), 12-inch-thick structural insulated panels on the roof, and a phase-changing gel in the walls that absorbs cold on summer nights and releases it during the day.

the roof (which is made of 12-inch-thick structural insulated panels). Windows are double-glazed and filled with krypton gas. "It has an incredibly tight building envelope," says Carmichael, who served as the project manager.

Indeed, according to the Passive House Institute U.S., the building has one of the lowest air-leakage values ever recorded in the country. That helps the structure retain heat in the winter months, but in the summer, when daytime temperatures reach into the 90s, some windows open automatically at night to bring in cool air. (Basalt is blessed with low humidity and cool summer nights.) In addition, a resin-based phase-changing gel in the walls keeps the building comfortable in the summer by absorbing the cold at night and releasing it during the day.

Office buildings typically have an air-temperature range of 68 F to 76 F and HVAC systems that are designed to condition the entire volume of air in a room, including the space above people's heads, an obvious waste of energy. RMI took a completely different approach, opting for an expanded temperature range—64 F to 82 F.

The design team considered a host of factors that affect personal comfort: interior air speed, humidity, employee clothing and activity levels, and radiant surface temperatures. The architects virtually eliminated the cold air that radiates from poorly



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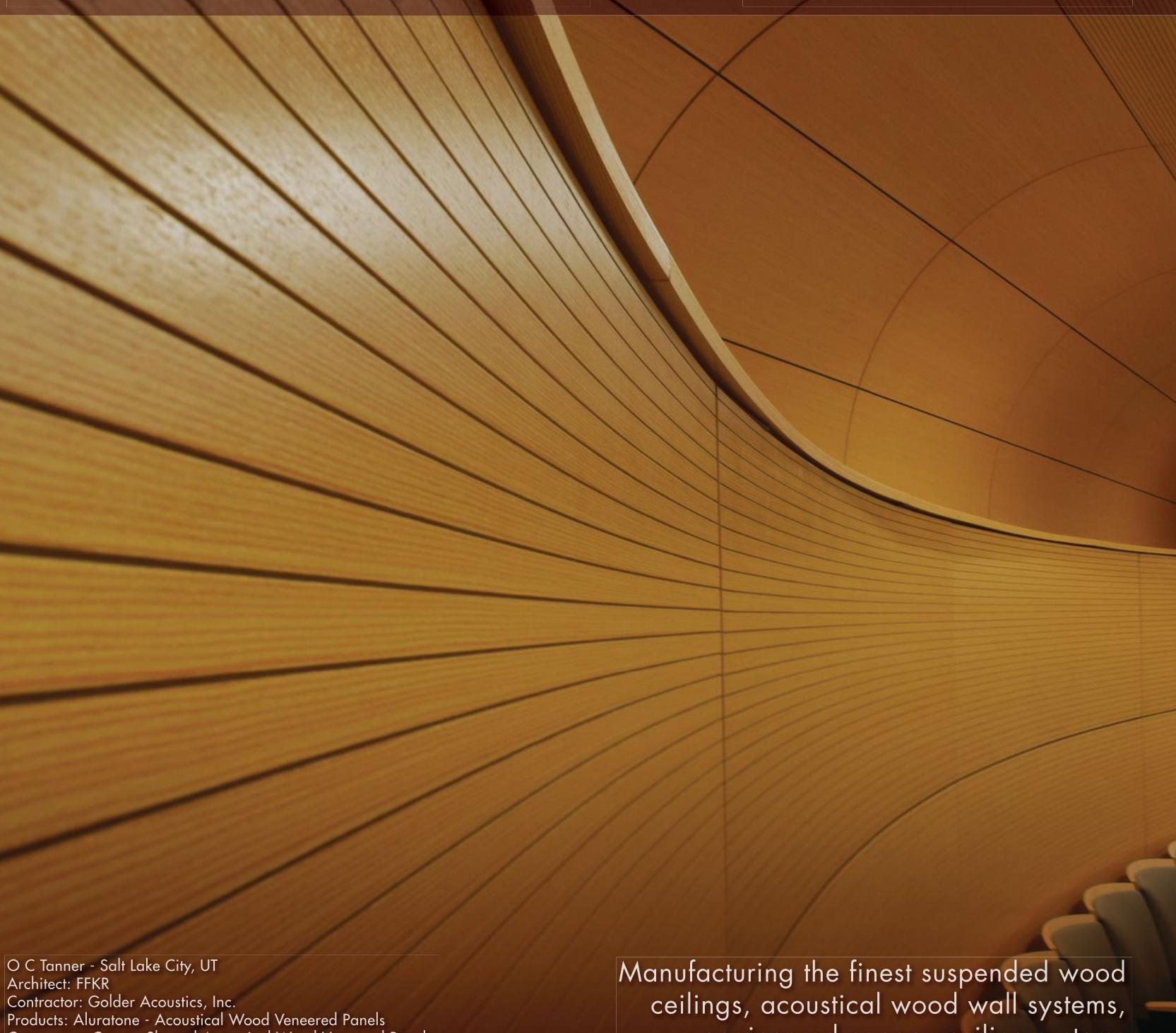
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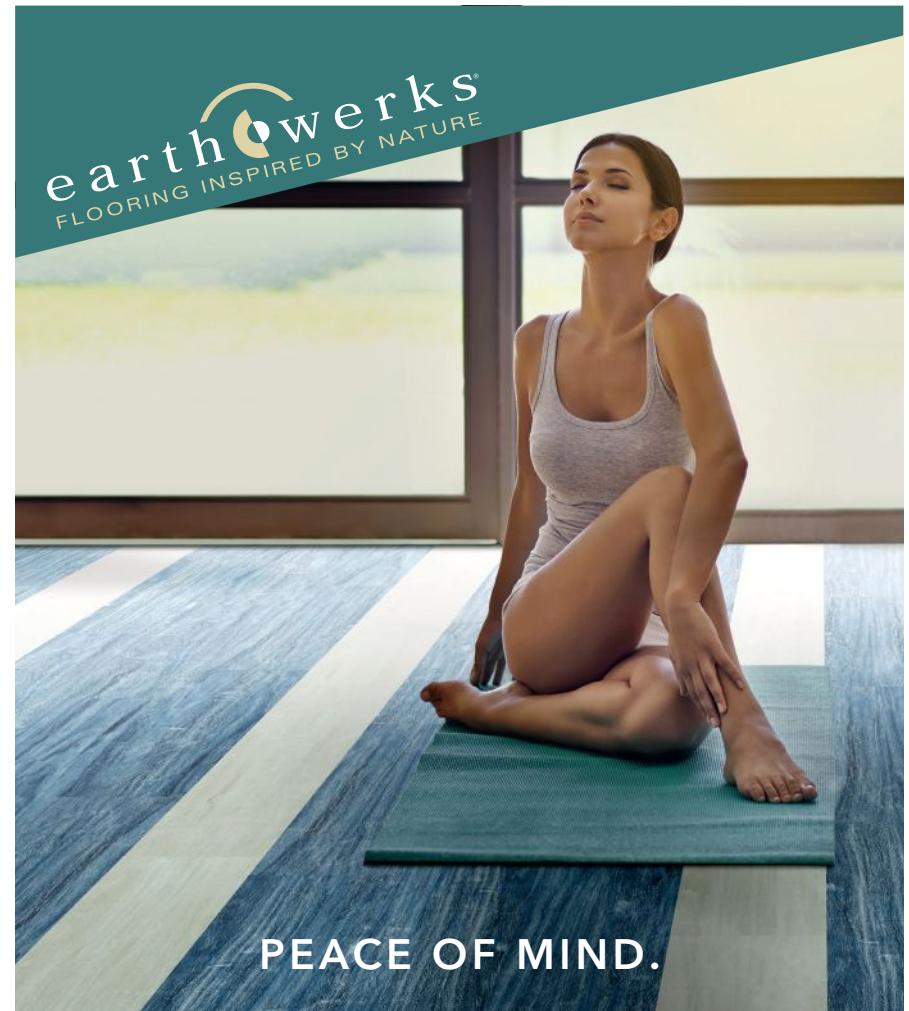
insulated walls and windows, for instance. And RMI gave employees much greater control over their own comfort (all the various factors are calculated and monitored by an online “thermal comfort tool”). On winter days, they are likely to be wearing sweaters or fleece. In the summer, some will opt for shorts and short-sleeve shirts. (It helps that RMI has a casual office culture.) Because workers are not tethered to specific desks or cubicles, they can move to different parts of the building depending on where they’re most comfortable. An employee who tends to get cold might opt for a spot close to the south-facing windows.

Then there’s the Hyperchair. Invented at the University of California, Berkeley’s Center for the Built Environment and now being marketed by engineer (and RMI fellow) Peter Rumsey, it looks like an ordinary black office chair, but it has a built-in heating element (like a seat in a luxury car) and fans, which can be controlled by the user. The chairs are battery powered and use a fraction of the energy of, say, a space heater. RMI ordered 70 Hyperchairs for the building (at \$1,900 a pop, they aren’t exactly cheap, but the institute enjoyed a discount). “Instead of heating and cooling the entire building,” Berg says, “we’re heating and cooling the people inside the building.”

#### Beyond Green

Lovins made it clear that he was looking for more than just a science experiment, however. He wanted a beautiful building. Berg recalls a meeting where Lovins pronounced, sage-like, “This building will create delight when entered, health and productivity when occupied, and regret when departed.” The architects took Lovins’ entreaty to heart. Brooks says he wanted the structure to “feel almost as if it grew from the ground.” For the exterior, he chose a combination of Colorado sandstone, zinc panels, and untreated juniper

wood. Enchanted by the local geology, in particular the way falling snow tends to get captured by rock outcroppings and cliffs, he designed battered and textured sandstone walls to create the same effect. On the north side, the walls are broken up by narrow, vertical windows, evoking a jagged mountain range.



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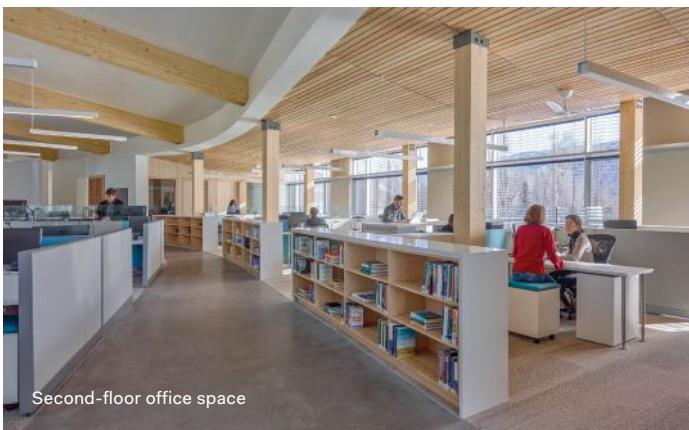
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Second-floor office space

Inside, Brooks worked with a similarly earthy palette of materials: concrete floors, locally sourced beetle-kill lumber, and cross-laminated timber panels. The ground floor has some office space, but it's largely designed to accommodate meetings and seminars for visiting clients and researchers. Most of the second floor is an open-plan office area, but there's also a reading room, a conference room, and a corner office (complete with walls and a door) for Lovins.

#### A Compelling Case Study

From the outset, RMI has said the story of the new building is as important as the building itself—meaning that the organization wants to inspire other business owners, developers, and architects to build similar, energy-efficient small office buildings. It's a common building type, says RMI's Carmichael: 90 percent of U.S. commercial office buildings are less than 25,000 square feet. The institute spent \$13.67 million on its new headquarters, she says, only about 10 percent more than the cost to build a more conventional structure on the same site without any net-zero features or premium-grade finishes. But because of the money RMI will save on energy costs, the payback will take just four years. "That's a pretty compelling story," Carmichael says. "Net zero isn't that much more expensive to do."

The institute also hopes others will embrace the Integrated Project Delivery approach it used. The nonprofit, ZGF, and the general contractor signed an agreement that included common goals and financial incentives for achieving them on time and on budget. "We're still going through the numbers," Carmichael says, "but it's looking very positive."

"We think this building can really inform the industry," Carmichael says. "Not that we want to see 100,000 buildings just like this everywhere. That would miss the point of what we're trying to do. We designed it for this particular location and climate. If you picked it up and moved it to Florida, it wouldn't work. But we hope to inspire people to put the same thought and care into designing their own sustainable office buildings."

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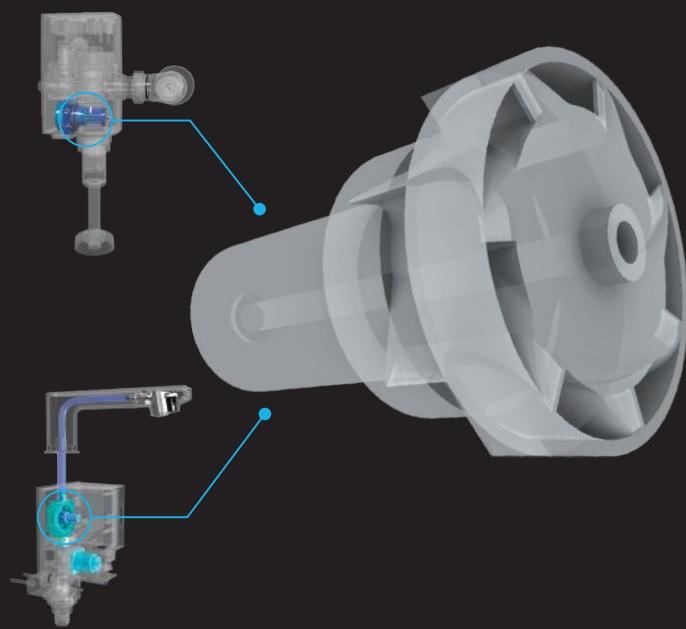


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# Ralph Johnson: New Topographies

INTERVIEW AND PROJECT DESCRIPTIONS BY THOMAS FISHER, ASSOC. AIA  
PHOTOS BY JAMES AND CONNOR STEINKAMP

**It's been fascinating for me seeing how your work has changed over the years. It strikes me that these three projects [shown on the following pages] are much more landscape-driven than your earlier work. What is the evolution in thinking that has led you in this direction?**

*Ralph Johnson, FAIA:* When I remember back to my work in the '80s, I think of Midwestern-oriented work. And since then Perkins+Will has grown tremendously. We have 25 offices now, and I'm working around the world and in different contexts. All of these buildings are contextual somehow, but it's an evolving view and I'm open to other interpretations of context than simply the literal ones. With the Coast Guard project [page 98], it was about making the building and the land into one—melting the structure into the hillside like a hill town. In the case of the Shanghai Natural History Museum [page 88], it was about scaling a very large, almost half-million-square-foot building to an existing sculpture park. And at Case Western [page 80], the building stretches out horizontally to grab three axes connecting back to different areas of campus. It was the opposite of the Shanghai project—more about increasing the scale and impact of the building.

**I have always thought that a characteristic of great architects is to not only have clear ideas but to be able to follow them through. In the Shanghai project, your idea starts with a nautilus. It's fascinating, but I can see how it could get watered down in the design process.**

Hopefully the idea gets better, too. But I think holding onto it is the key. You have a lot of people involved in the process when you're doing big or public buildings. But in Shanghai, the idea of the nautilus was reinforced as we developed the circulation patterns inside the building. It became an organizing device, similar to the Guggenheim, where you go to the top and then spiral down. It continued into the evolution of the interior.

**Has the composition of your teams or your process changed while doing buildings like this?**

In Shanghai and at the Coast Guard, especially, we were working with really excellent landscape architects, so it was very much an integrated process—not just an appliquéd at the end. And we're developing a really good landscape practice at Perkins+Will. Working in an interdisciplinary way allows the form-making to evolve out of the landscape or sustainable ideas.

**This integration of landscape and built forms goes back to early Modernism. There's a passage in one of Le Corbusier's early books where he fantasizes about flying over the modern city and not seeing the built structures—that it would just be green. In a way, you realize that in these works. How are your current projects continuing these ideas?**

We're doing a master plan for 4,000 units of housing around River City in Chicago, and we worked with Hoerr Schaudt Landscape Architects on integrating public open space along the river. It's like Corb says—there is a garden level connected with bridges so that you can have a connective park in the sky. And it's not just a private gated community; it's trying to create connections. I'm interested in that, and in looking for other opportunities to continue exploring that idea.





**Tinkham Veale University Center,  
Case Western Reserve University  
Cleveland**





View from west

Linking three districts of the Case Western Reserve University campus, this low-slung student center captures the energy of its community with long arms that reach out to passersby and green roofs that visually merge it with the landscape. The building's angular plan responds to, and wends between, two outdoor spaces: a soccer field covering below-grade parking that could not bear added weight, and an existing sculpture garden containing several pieces by Cleveland-born architect Philip Johnson.

The building follows the flow of pedestrian circulation: A grass ramp stretches toward the nearby art museum and culminates in an outdoor amphitheater, and two-story triangular wings extend toward the engineering and science buildings and

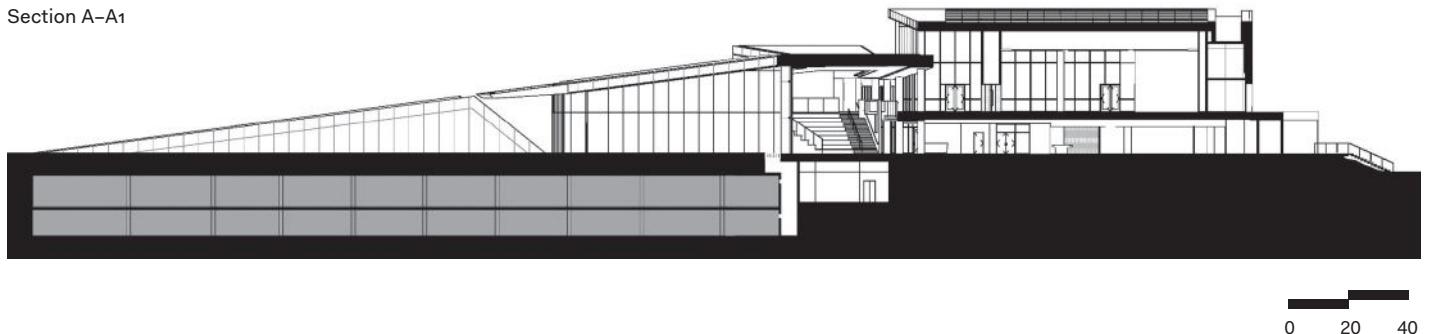
toward the liberal arts and professional schools, respectively. A second-story terrace and outdoor stair overlook the quieter sculpture garden.

Ample daylight fills the building's glass-walled interiors. Wood-clad terraced seating overlooks the double-height lobby, connecting it to second-floor offices and meeting rooms, while another two-story space faces the amphitheater and a third wraps around a media wall.

The building is also energy efficient: a west-facing, ventilated, double-glazed wall allows views while lowering heat gain, and the green roofs insulate and reduce heat-island effects. This student center is not just on the campus, it is of the campus—it is impossible to tell where the building ends and the campus begins.



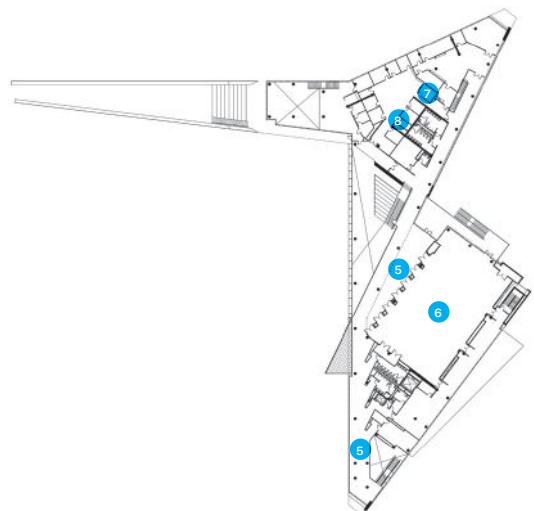
Section A-A1



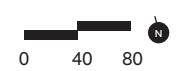
Ground-Floor Plan



Second-Floor Plan



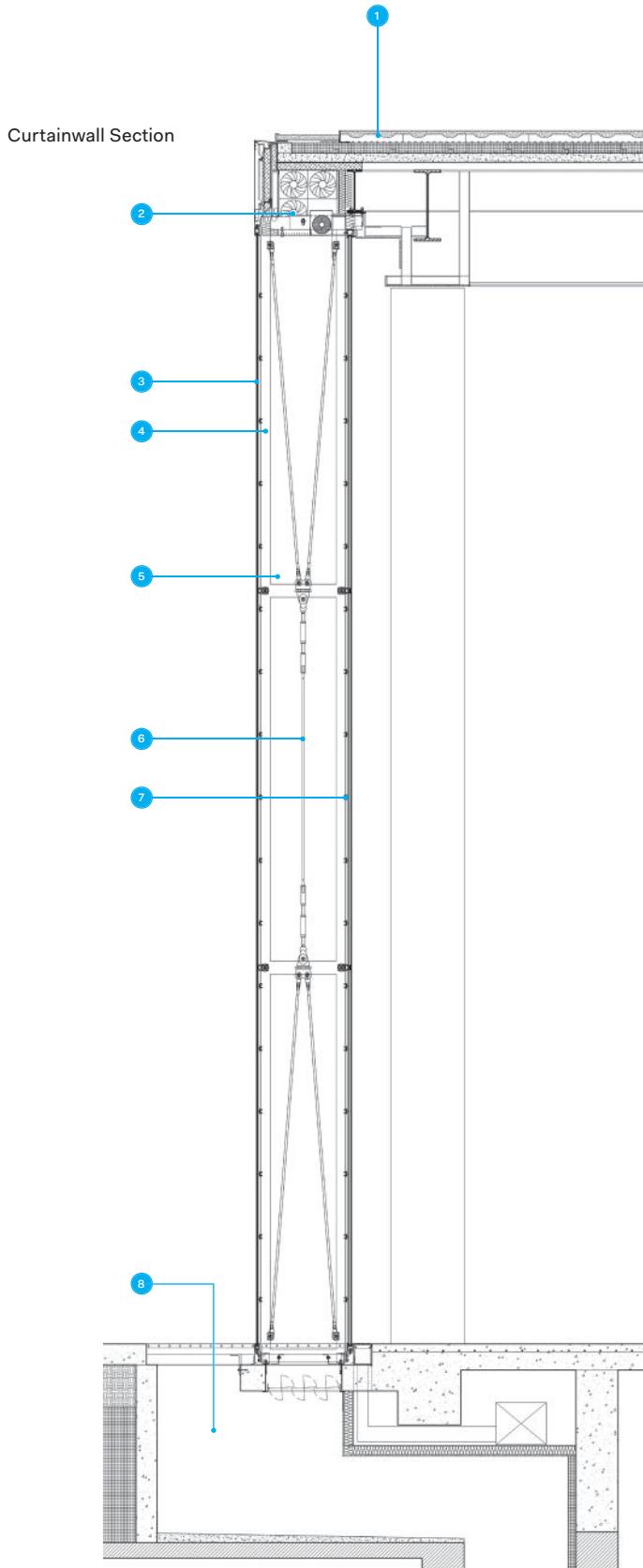
- 1. Lobby/Commons
- 2. Café
- 3. Multipurpose room
- 4. Administration
- 5. Lounge
- 6. Event space
- 7. Inamori Center for Ethics
- 8. Mather Women's Center





Lobby with café seating





Curtainwall Section

**Project Credits**

**Project:** Tinkham Veale University Center,  
Case Western Reserve University, Cleveland  
**Client:** Case Western Reserve University

**Design Architect/Interior Designer:**

Perkins+Will, Chicago · Ralph Johnson, FAIA (principal/design principal); Mark Jolicoeur, AIA (principal/project manager); Jeff Stebar, AIA (planning principal); Carl Knutson, AIA (senior project designer); Bryan Schabel, AIA (senior designer); Marc Nunes, AIA, Mark Walsh, AIA (senior project architects); Alex Wu, AIA, Max Adams, AIA (project architects); Dan Ferrario (arch III); David Sheehan (senior interior designer); Lauren Prickett (interior project manager); Krisan Osterby, Ben Sporer (landscape architects); Laura Kamin-Lyndgaard (landscape arch II); Brian Weatherford (branded environments principal); Dennis Blaul (director of specifications)

**Associate Architect:** CBLH Design

**Mechanical/Electrical Engineer:** Affiliated Engineers

**Structural Engineer:** Thornton Tomasetti

**Civil Engineer:** KS Associates

**Geotechnical Engineer:** Professional Service Industries

**Construction Manager:** Donley's

**Landscape Architect:** Perkins+Will

**Lighting Designer:** Schuler Shook

**Acoustics/Audiovisual:** Shen Milsom Wilke

**Curtainwall Consultant:** Stutzki Engineers

**Commissioning Authority:** Eaton Corp.

**Size:** 89,513 gross square feet

**Cost:** \$40 million

1. Green roof assembly

2. Exhaust plenum with axial fans

3. Monolithic low-iron glass

4. Steel barstock framing

5. Mechanically ventilated cavity

6. Stainless steel tensile bracing

7. Insulated low-iron glass

8. Intake plenum

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Ventilated double-glazed wall



## **Shanghai Natural History Museum Shanghai**





View of main entrance from southwest

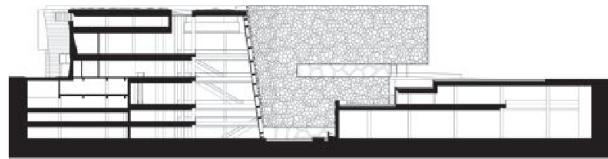
Located in the heart of Shanghai, this building asks us to contemplate our relationship to nature—as a natural history museum should. Its nautilus-shaped core, representing one of the most efficient forms in nature, enables people to spiral up from the surrounding park onto the building's extensive green roof, into the museum under its corner entry canopy, and down into a courtyard and light well, whose meandering stairs and irregular pools recall Chinese water gardens. The courtyard's curving glass wall follows the spiral up, down, and around, shaded by a screen whose fractured pattern echoes the cracked-ice pattern of traditional latticework as well as biological cells.

From the park to the east, visitors see a vertical, planted wall with cutouts for windows and signage;

the museum faces the street to the north with an undulating, geological masonry wall that recalls sedimentation and erosion. From the nearby residential towers, the rectilinear and curving form of the museum's green roof repeats the patterns of the pathways in the neighboring Jing'an Sculpture Park.

Although much of the museum stands below grade, the spiraling light well illuminates an indoor atrium and the circulation that surrounds it. Skylights over the curving central spine through the building bring daylight deep inside, ensuring that the exhibits about nature never seem far from the natural world. And as in nature, this building handles functional complexity with simplicity and clarity, showing an evolved design mind at work.



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

1. Lobby

2. Exhibit hall

3. Lecture hall

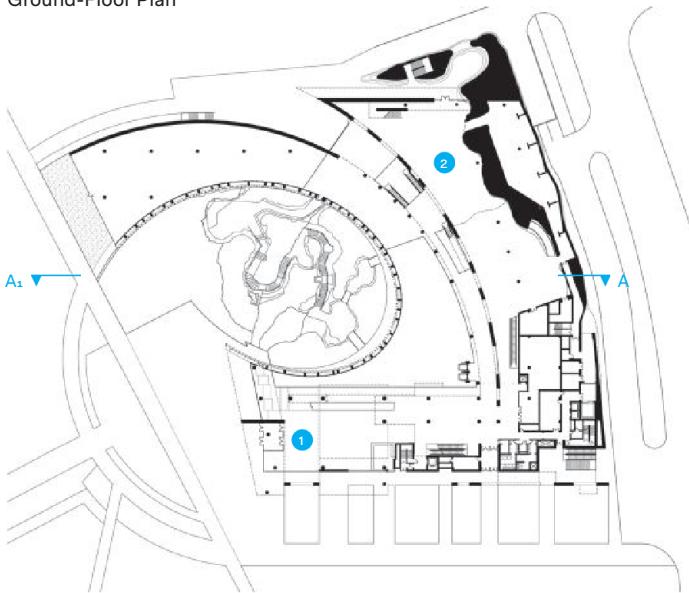
4. Theater

5. Café

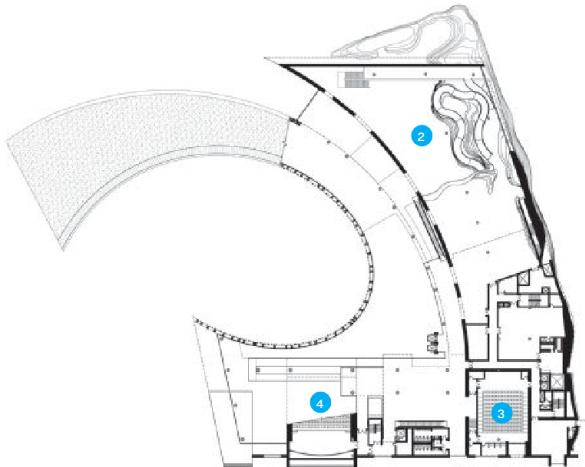
6. Courtyard

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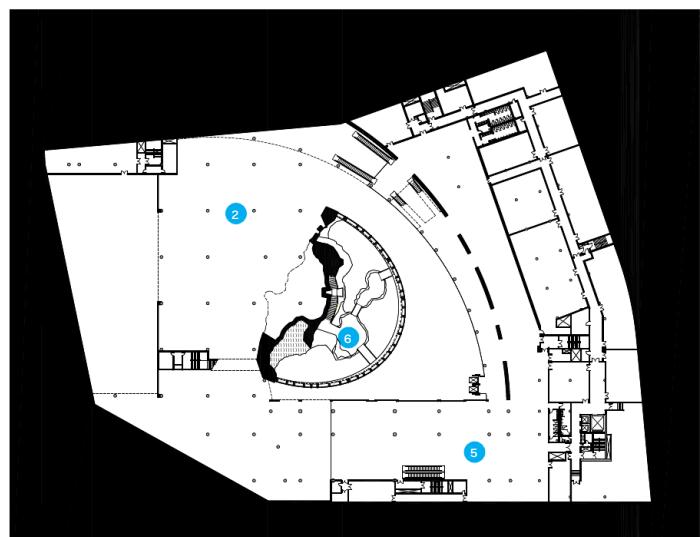
Ground-Floor Plan



Second-Floor Plan



Basement-Level-Two Plan



Basement-Level-One Plan

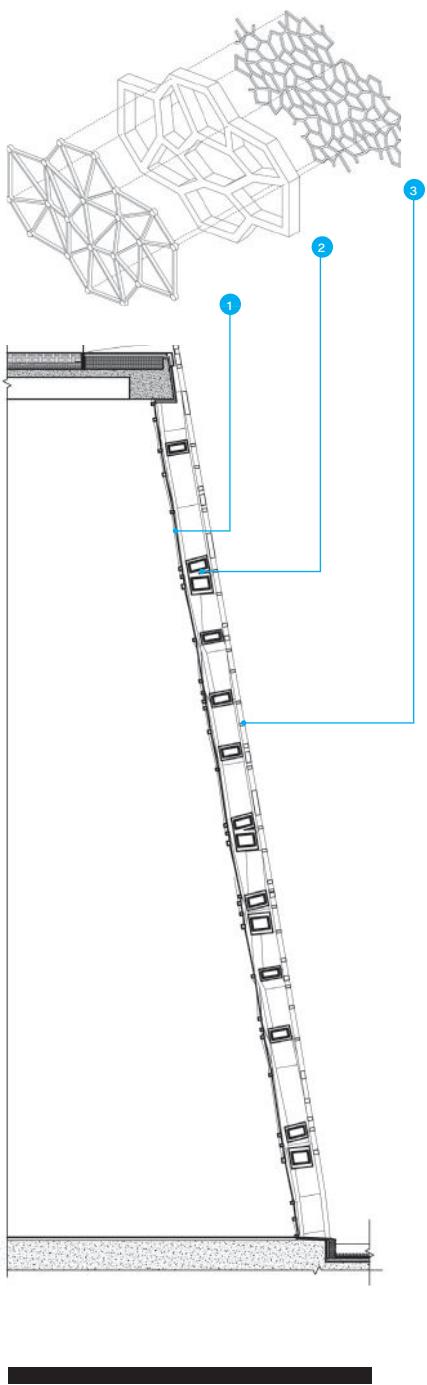


View from north





Courtyard Wall Axon and Section

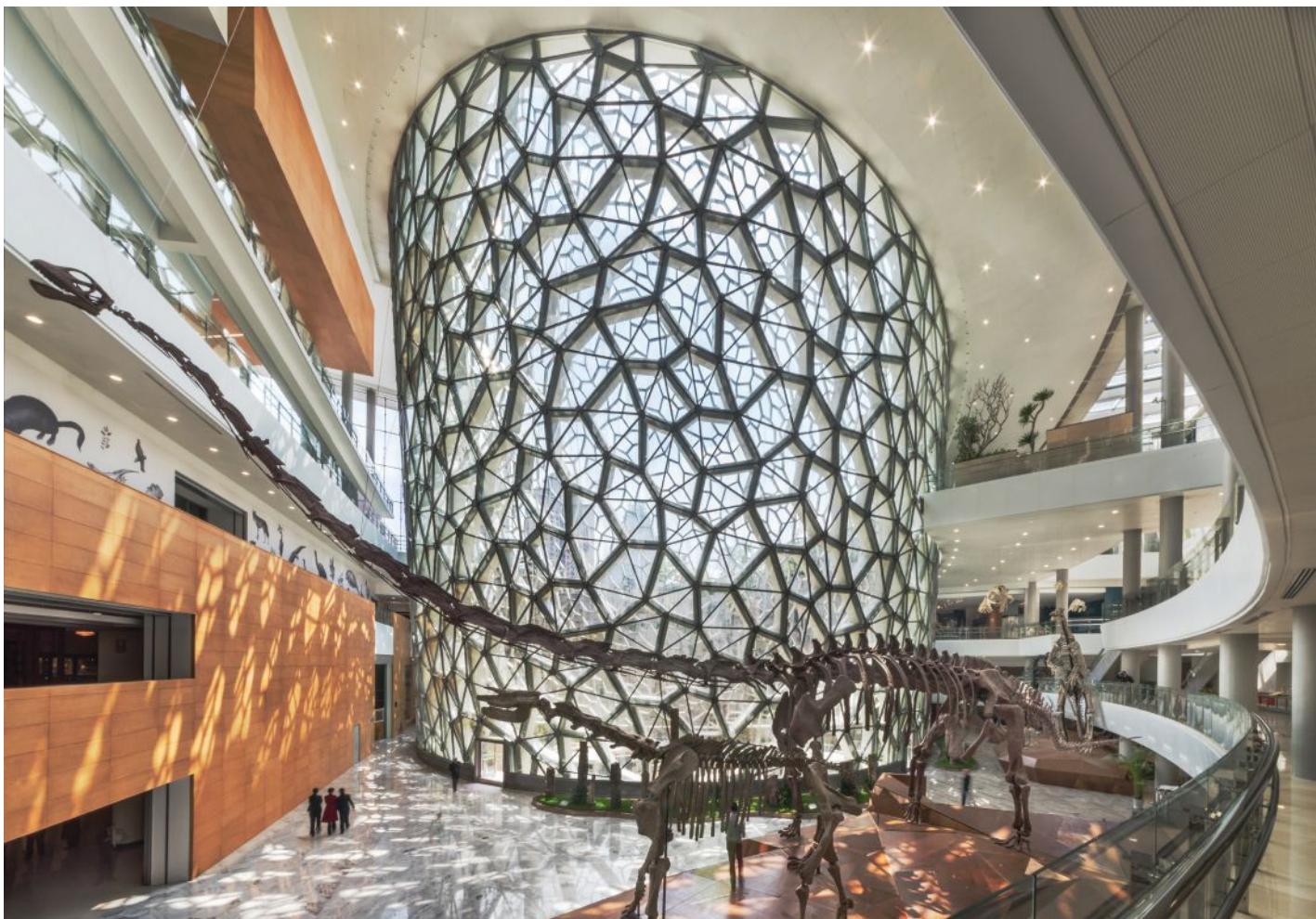


1. Aluminum curtainwall
2. Aluminum-clad steel structure
3. Aluminum sunscreen





Central courtyard



#### Project Credits

**Project:** Shanghai Natural History Museum, Shanghai  
**Client:** Shanghai Nature Museum - Mr. Gu Jiansheng (deputy director)  
**Architect:** Perkins+Will, Chicago · Ralph Johnson, FAIA (design principal); G. William Doerge (principal-in-charge); Grace Chen (project manager); Bryan Schabel, AIA (senior project designer); Marius Ronnett, AIA (senior project architect)  
**Interior Designer:** Perkins+Will  
**Associate Architect:** Tongji University  
**Architectural Design & Research Institute**  
**Engineer of Record/Mechanical/Structural/Civil Engineer:** Tongji University  
**Architectural Design & Research Institute**  
**Construction Manager:** Shanghai Science & Technology Museum  
**General Contractor:** Shanghai Construction Group  
**Landscape Architect:** Hoerr Schaudt Landscape Architects  
**CFD Simulation Report:** Tongji University

**Green Building and New Energy Research Center**  
**Curtainwall Consultant:** Aurecon  
**Curtainwall Contractors:** Sinobau; Shanghai Mechanical Construction Group  
**Exhibit Design:** Gallagher & Associates  
**Exhibit Contractor:** Shanghai Arts Design  
**Exterior Lighting Consultant:** Shanghai SJ Lighting Engineering & Equipment  
**Fire Protection Consultant:** Rolf Jensen & Associates  
**Geothermal Heat Pump Feasibility Report:** Jiangsu Green Building Engineering Research Center  
**Interior Contractor:** Shanghai Xinli Decoration Engineering  
**LEED Consultant:** Shanghai GreenCity  
**Sustainability Consultants:** DHV  
**Sustainability Consulting Cooperative Parties:** Shanghai Educational Engineering; Haskoning  
**Size:** 479,180 square feet  
**Cost:** Withheld

Above: Circulation spine

Opposite: Exhibit hall



## United States Coast Guard Headquarters Washington, D.C.





It takes real skill to add the 1.2-million-square-foot U.S. Coast Guard Headquarters to St. Elizabeths National Landmark campus in Washington, D.C., without detracting from that historic setting. The first phase of the Department of Homeland Security's consolidation project, the Coast Guard's new site slopes down 115 feet, the building stepping downhill toward the Potomac River. Green roofs make the structure disappear when seen from above.

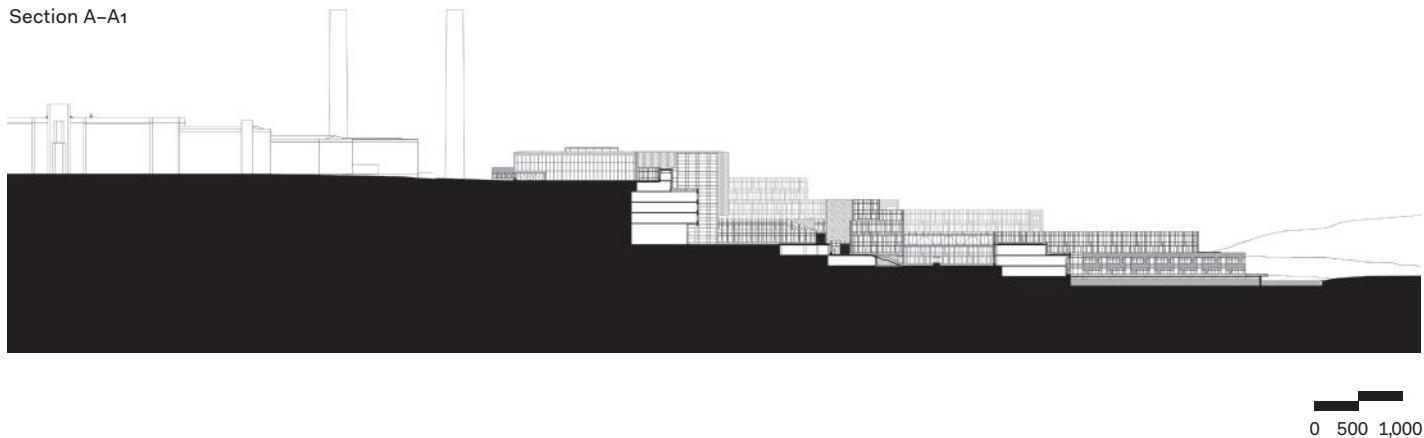
The structure's narrow wings and its perimeter brick walls echo the form and material of the nearby St. Elizabeths Hospital. But the cladding facing away from the campus toward the green roofs, courtyards, and views of the D.C. skyline has a much different character: glass curtainwalls, with irregular patterns

of mullions and green spandrel panels that echo the foliage of the surrounding landscape.

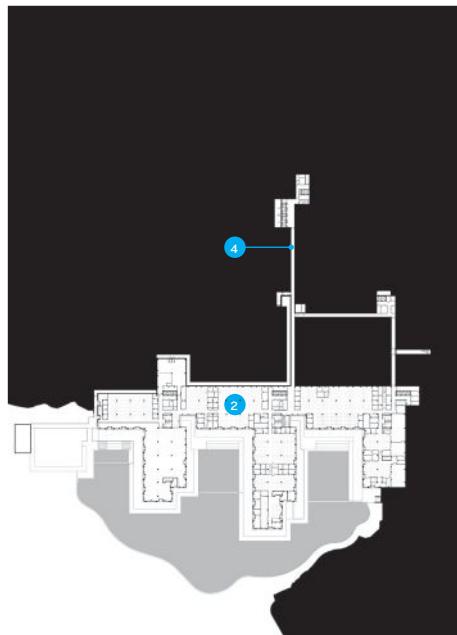
Entered at the top of the hill—through a zinc- and stone-clad portal—the building has a bank of glass-walled elevators that connect all 10 floors. A circulation spine links this entrance to the furthest wings at the bottom of the slope, making it easy to navigate what otherwise looks like a complicated plan.

Because of the excavation required to work the massive square footage into the sloped site, the design team also had to think about water circulation to keep flooding at bay, devising a system that pumps groundwater from the foundation drains back to the aquifer. The base of the site is anchored by a pond, keeping the institution's nautical sensibility at hand.

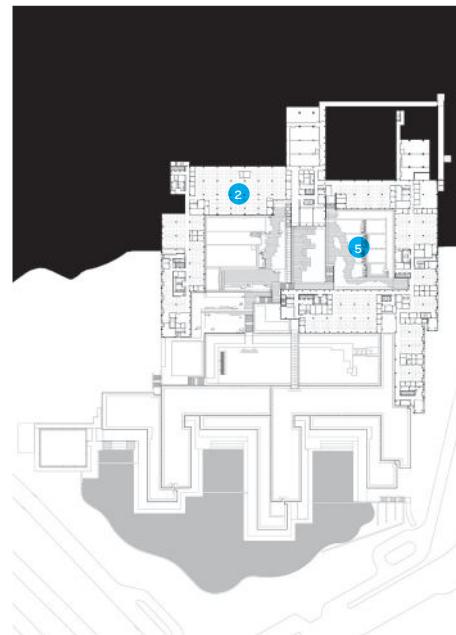


Section A-A<sub>1</sub>

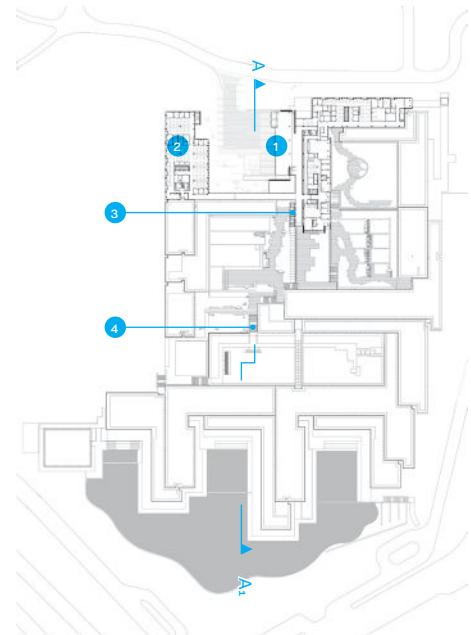
Lower-Level-Nine Plan



Lower-Level-Four Plan

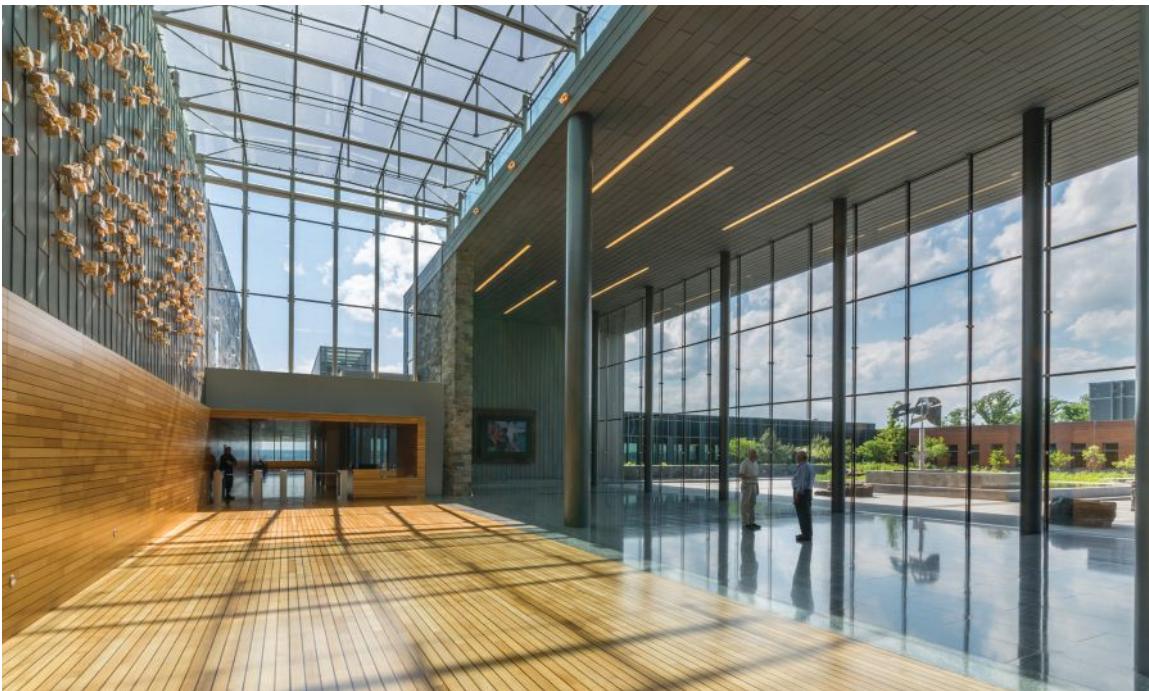


Ground-Floor Plan



- 1. Lobby
- 2. Offices
- 3. Elevator core
- 4. Circulation spine
- 5. Terraces

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*Top:* Main entrance at ground level, view from north

*Above:* Lobby interior

*Opposite:* View from northwest of terraces and glazed office blocks



View looking southwest over stepped volumes, terraces, and green roofs



### Project Credits

**Project:** United States Coast Guard Headquarters, Washington, D.C.  
**Client:** U.S. General Services Administration

**Design Architect:** Perkins+Will, Chicago · Ralph Johnson, FAIA (principal designer); Tom Mozina, AIA (senior designer); Bryan Schabel, AIA; Todd Snapp, AIA (design principals); Paul Clinch, AIA (project manager); Jane Cameron, FAIA (senior project architect); Aki Knezevic, AIA (CCC leader); Shane Mathewson (architecture team); Dennis Blaul (specifications); Ian Bush, Eileen Pedersen, AIA, Michelle Malecha (exterior wall team); Michael Rafferty (central utility plant team); Cassandra Cullison, AIA (interior project manager); Lynn Goldfarb, AIA, Thomas Gregory, Assoc. AIA (interiors)  
**Interior Designer:** HOK

**Mechanical Engineer:** Environmental Systems Design; Girard Engineering  
**Structural Engineer:** Thornton Tomasetti; Cagley & Associates  
**Electrical Engineer:** Environmental Systems Design; Girard Engineering; Dynalectric Co.  
**Civil Engineer:** William H. Gordon & Associates; Soltesz & Associates  
**Geotechnical Engineer:** GeoConcepts Engineering; ECS  
**Construction Manager:** AECOM  
**General Contractor:** Clark Construction  
**Landscape Architect:** Andropogon Associates; HOK  
**Lighting Designer:** Horton Lees Brogden; MCLA  
**Security Consultant:** Applied Research Associates  
**Vertical Transportation Consultant:** John J. Urbikas & Associates

**Historic Preservation Consultant:** Wiss Janney Elstner Associates; Quinn Evans Architects  
**Child Care Consultant:** Horizons Design; Michael Lindstrom Associates Architects  
**Fitness Consultant:** WTS International  
**ADA Consultant:** Willow Design  
**Cost Estimating Consultant:** William H. Gordon & Associates  
**Acoustical/Audiovisual Consultant:** Cerami & Associates; S2N Technologies  
**Blast Consultant:** Hinman Consulting Engineers; Weidlinger Associates  
**Fire Protection Consultant:** Applied Fire Protection Engineering  
**Envelope Consultant:** Simpson Gumpertz & Heger  
**Code Consultant:** Arup  
**Elevator Consultant:** Robert L. Seymour & Associates  
**Size:** 1.2 million square feet  
**Cost:** Withheld





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TEXT BY NATE BERG  
PHOTOS BY ROBERT YU



The house had to sit amidst the trees. The client helped plant the now 40-foot-tall pines on this family property as a child, and the new buildings he commissioned for this wooded lakeside site needed to nestle among them as unobtrusively as possible.

For Dallas-based Wernerfield Architects + Design, this guiding principle was already ingrained. The firm specializes in organizing the buildings and the outdoor spaces of high-end residential projects to harmoniously work with a given site. “The two kind of feed off each other. The yard feels bigger and the interior spaces feel bigger as well,” says Braxton Werner, AIA, one of the firm’s founding principals. This weekend house for a family with a deep connection to the landscape offered a chance to design a building that almost seamlessly transitions from indoors to outdoors.

“You can really reduce the scale of the footprint of the building and have an efficient use of space while still not feeling confined,” says Paul Field, ASSOC. AIA, the firm’s other founding principal. “Some of the best rooms on our projects are actually exterior rooms or courtyards.”

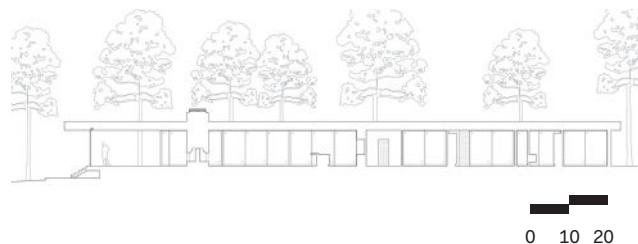
Located about 60 miles southeast of Dallas on the Cedar Creek Reservoir, the 4,600-square-foot house boasts an interior as elegant as its connection to the landscape. A stone wall lines the driveway, serving as a third wall for the sunken patio and firepit at the center of the L-shaped house. The main wing contains open common spaces like the kitchen and a conjoined dining room and lounge area. Full-height sliding glass doors on the east and west façades face the lake and the courtyard, respectively, opening these areas to the lake’s breezes and offering protected views when the winds pick up. Additional full-height windows provide views throughout. The only part of the house that rises above its single-story profile is the “treehouse,” a watchtower of a room intended for the children.

Another structure to the west contains a guest suite and storage flanked by a covered porch and a carport, lined on two sides by a bocce ball court and an existing tennis court. A storage barn, also designed by the firm, sits beyond. Wernerfield worked with Dallas landscape architecture studio Hocker Design Group from the start, developing the site’s layout, the relationship between the buildings and the trees, and the guiding geometries of the stone wall and wings of the main house. “It was a very holistic process,” Werner says.

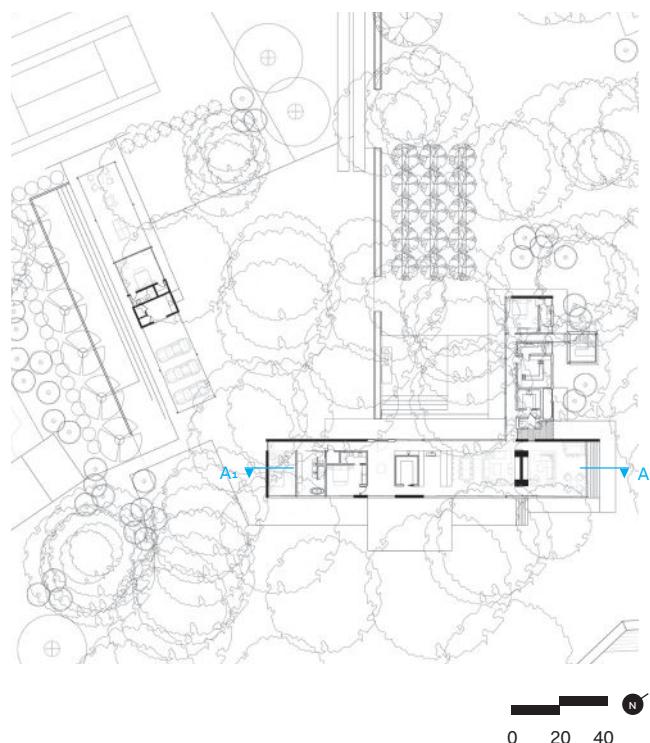
Two primary materials—concrete and rusted carbon steel—are evident throughout. The architects chose them for what they call their visual quiet because neither they nor the clients wanted the house to detract from its surroundings. “It’s more about the spirit of the place than the architecture itself,” Field says.

*Previous Page:* Raw 14-inch-thick concrete, used throughout the house’s interior and exterior, forms part of the entry façade. The overhanging flat roof is wrapped with rusting carbon steel.

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



Ground-Floor Plan





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*Top:* Sliding glass doors from Fleetwood open common spaces, like the family room on the house's northeast side, to the outdoors.

*Bottom:* The carbon steel-covered "treehouse" on the north side is linked to the main house by a short glass hallway.

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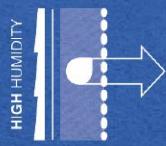
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Inside, ceiling panels from East Teak Fine Hardwoods—the source for all of the wood in the project—run above polished concrete floors.



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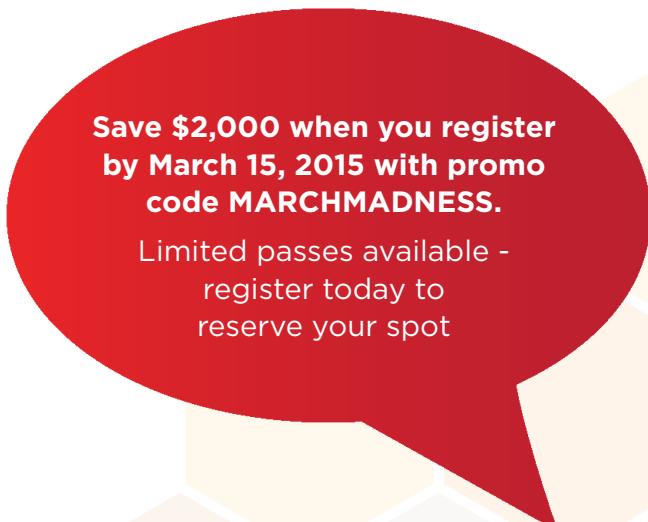
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The concrete walls are left exposed throughout, including in the master bedroom of the four-bedroom, four-and-a-half-bath main house.

#### Project Credits

*Project:* CCR1 Residence, Trinidad, Texas  
*Client:* Withheld  
*Architect/Construction Manager:*  
 Wernerfield Architects + Design, Dallas ·  
 Braxton Werner, AIA, Paul Field, ASSOC. AIA  
 (principals)  
*Interior Designer:* Emily Summers Design  
 Associates

*Structural Engineer:* L.A. Fuess Partners  
*General Contractor:* Wernerfield Architects  
 + Design; TC Robinson Group  
*Landscape Architect:* Hocker Design Group  
*Size:* 4,600 square feet (main house); 550  
 square feet (guest pavilion); 3,500 square  
 feet (storage barn)  
*Cost:* Withheld



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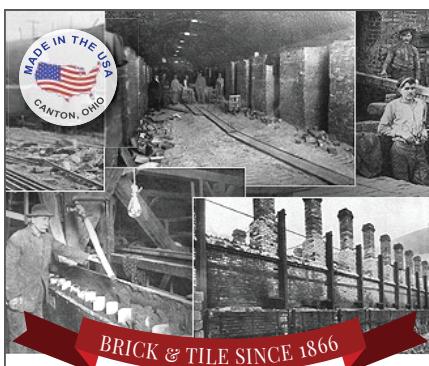
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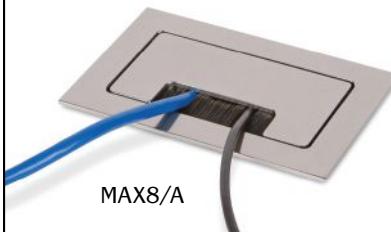
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# Editorial: Politicians, Ugly Buildings, and Whores

Last month's announcement that the City of Chicago is granting landmark status to Marina City hit me like a shock wave. Not because Bertrand Goldberg's design isn't worthy—quite the contrary—but because it's so hard to believe that Marina City wasn't already landmarked. Those double corncob spires, which date back to 1963, are as iconic as any building in Chicago. What took so long? With so many other significant buildings of the era already demolished or actively endangered, an entire generation of American architectural production seems under threat.

In the case of Marina City, Bertrand and his architect son Geoff began lobbying for landmark designation more than 25 years ago. According to a story by ARCHITECT contributor Edward Keegan, AIA, their efforts long failed to gain traction with the powers that be, and only when the 2014–15 demolition of Goldberg's Prentice Women's Hospital drew heated protest did Mayor Rahm Emanuel and others warm to the notion that Marina City deserves legal protection.

Prentice, it is widely known, fell victim to the expansion plans of owner Northwestern University. The City of Chicago chose not to oppose the powerful institution, effectively allowing commerce to best culture. I suspect the landmarking of Marina City may be the mayor's way of compensating the design and preservation communities for their loss. Ah, politics.

Meanwhile, Bostonians may finally be succumbing to the Brutalist charms of their City Hall and Plaza (the former the work of Kallmann, McKinnell & Knowles, the latter of I.M. Pei & Associates). As Christine Cipriani reported for ARCHITECT, traditionally, "whenever the *Boston Globe* runs a story touching on the design ... readers' comments add color: 'That whole area looks like Moscow in 1980.' 'Dear Lord, knock it down.' 'No amount of tinkering can save it.'"

Now, Cipriani writes, "Reader's comments are starting to sound more like these: 'While I don't like

Brutalist architecture, it's a style that by now has some historical value/merit. It should be preserved as an example of what was built in the past.' 'This building is very interesting and has the potential to be extraordinary with the right lighting, plaza activity, landscaping, signage. But like Charlie Brown's tree, it needs some TLC!'"

I was fascinated to learn that City Hall's co-designer, Michael McKinnell, FAIA, agrees there is need for TLC. At a Boston Society of Architects forum in January, he argued that "a very considerable and radical intervention" would be necessary for the hall and plaza to live up to the original, competition-winning vision of 1962. He may get his wish: Last year the city government launched Rethink City Hall!, a public process for making design changes to the site.

There's a wonderful scene in the 1974 Roman Polanski film *Chinatown*, where John Huston's creepy businessman tells Jack Nicholson's private dick, "Course I'm respectable. I'm old. Politicians, ugly buildings, and whores all get respectable if they last long enough." Personally, I don't think Marina City or Boston City Hall and Plaza are ugly, but lots of people did, and do. Innovations can be alarming, and it can take decades to shift popular and political opinion. Sometimes preservation is just a waiting game.



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